

**Results of a Physician Study Pilot in the
New City of Hamilton Region**

February 2002

National Studies on Acute Gastrointestinal Illness Introduction

Morbidity and mortality resulting from acute gastrointestinal disease is a serious health concern around the world. Information on the degree to which health systems are impacted by the burden of individuals suffering from enteric disease is varied. The importance of determining the degree to which infectious gastrointestinal disease occurs in the population has been shown in a number of international studies that highlight the problem of severe under reporting. To date, only a few countries (England, Wales, United States and the Netherlands) have conducted studies that can actually provide confident, research-based estimates of the true incidence of gastroenteritis in their population (Wheeler *et al* 1999, Chalmers & Salmon, 2000, Hoogenboom-Verdegaal *et al.* 1991, CDC FoodNet).

In Canada, federal and provincial government agencies have had to rely on US statistics obtained from the CDC FoodNet, on which to base their decisions in creating policies on health and health care.

As part of an initiative to improve the understanding of infectious enteric disease in Canada, a team within the Division of Enteric, Foodborne and Waterborne Diseases in Health Canada has designed a multi-level study that will focus on the population, physicians and the testing laboratories. This initiative is entitled “**National Studies on Acute Gastrointestinal Illness**” (**NSAGI**). The aims of the study are to better determine:

- the actual level of acute gastrointestinal illness in the population;
- factors that prompt individuals to seek medical care;
- the burden of illness/impact of GI illness on individuals and the health care system;
- the patient load that is created by GI illness and the general protocol that physicians follow upon diagnosis;
- laboratory protocol and information on number and type of samples received;
- laboratory information on results of testing
- the movement of test results through the reporting chain.

Another intention of NSAGI is to better determine the relationship between the actual incidence of acute gastrointestinal illness in the community, and the number that are finally reported at the national level. The methodology behind this study includes four elements, which will be conducted multi provincially: a population survey, a physician survey, a laboratory survey and a public health reporting survey. All of these are important stages of the reporting pyramid illustrated in Figure 1.

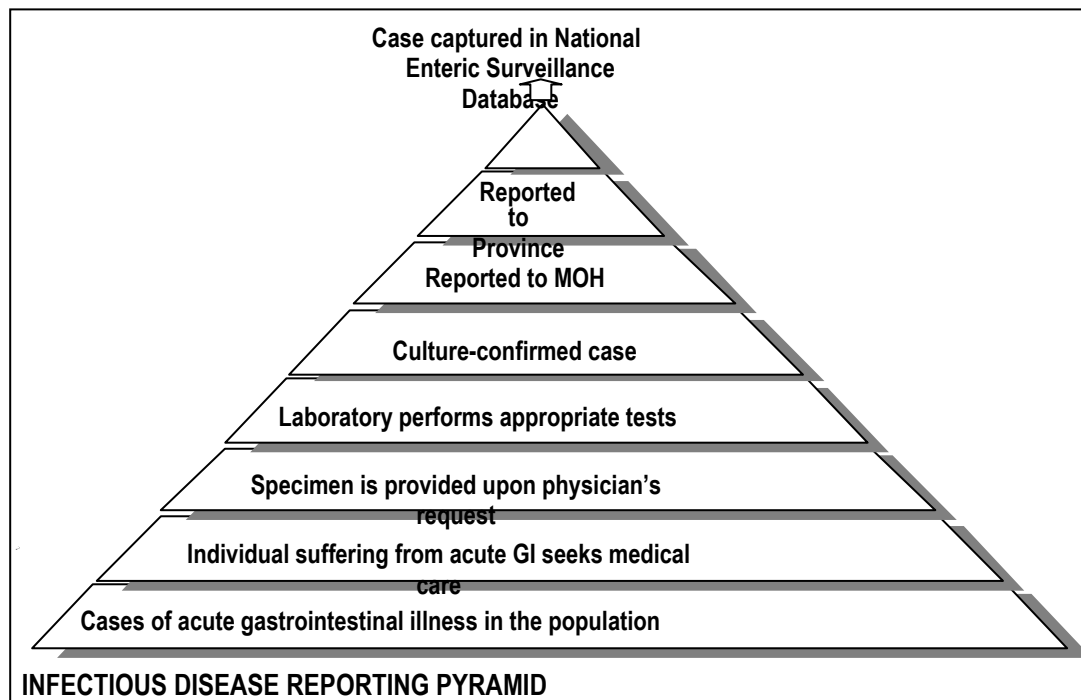


Figure 1. Infectious Disease Reporting Pyramid.

A major concern with this system is the under-reporting that occurs at each of the levels. International studies of this subject have repeatedly shown the high degree of under-reporting of enteric disease (Sethi *et al*, 1999, DeWit *et al*, 2001, Wheeler *et al*. 1999). One of the main goals of the NSAGI project is to address this problem in trying to approximate the level of under-reporting at each interface. Armed with this knowledge, a more accurate picture of the true impact of enteric disease on the public health system could be ascertained. To date, the NSAGI team has begun the initiative by creating:

1. A community population survey, using a telephone questionnaire regarding the occurrence of acute gastrointestinal illness, administered to a systematically selected individual within randomly selected households.
2. A physician survey directed at all active general practitioners within the community under study. Under investigation is the proportion of patients seen who are diagnosed with gastroenteritis, and subsequently what proportion of those are asked to submit a stool sample. Also included is a review of physicians' diagnostic protocols.
3. A laboratory survey that will be sent to all Canadian laboratories licensed to perform microbiological tests on stool specimens (excluding service collection centers and provincial public health laboratories).
4. A public health reporting study intended to quantify the number of cases captured at the local health authority interface and the number transferred to the provincial level. It will also examine the variation in reporting practices within and between local health authorities and discuss how this variation may impact on the interpretation of provincial and national surveillance data.

Physicians play an important role in the reporting of disease in the local, provincial and national health system. They represent the first stage at which an individual enters the public health system. Individual practice, local, provincial and national protocols all play a part in defining how the patient is assessed and further managed at the general practitioner (GP) level.

As a result, the physician study will involve surveying a representative sample of GPs in participating communities in an attempt to quantify the impact of under reporting in the stage between the physician and the testing laboratories. The survey should also lead to a better understanding of the general guidelines and protocols used by physicians, and assess how this affects the chain of events leading to a reportable case of acute gastrointestinal disease at the national level. Actively practicing family physicians, pediatricians, and doctors in emergency rooms and walk-in health clinics will be included.

With the support and co-operation of the Laboratory for Foodborne Zoonoses (Health Canada) and McMaster University, a pilot study of the physician survey was organised and implemented in the new city of Hamilton. The results of this survey are presented here.

The Physician Study Pilot

The area of the new City of Hamilton would represent a population of approximately 500,000 people. A complete mailing list of all actively practising family physicians and paediatricians in this area (which includes the city of Hamilton, Ancaster, Glanbrook, Stoney Creek, Dundas and Flamborough) was obtained from the Hamilton Academy of Medicine. To be eligible to complete the survey, physicians were required to be directly involved with patients at least 8 hours per week, and that at least 25% of their patient base came from the new City of Hamilton area. Physicians were asked to classify their practice as community based, hospital based, emergency department room, walk in clinic or 'other'. They were also asked if they were part of a multiple physician practice or not, and approximately how many patients they themselves had under their care.

Physician Survey Methodology

A 7-page survey was finalised after pre-testing on a number of physicians and medical professionals. The time required to complete the survey was found to be approximately 7-10 minutes. Questions were asked to determine approximate numbers of patients in their practice, seen in the last month and diagnosed with acute GI. The survey also addressed personal perceptions and protocols regarding diagnoses, sample testing and laboratory practices.

The Survey Tool

The physician survey specifically addressed the following major points of interest:

- What percentage of patients entering the practice/clinic in the last month is diagnosed with acute gastrointestinal illness?
- Is there a standard protocol once a diagnosis of gastrointestinal illness has been made?
- What major factors prompt a doctor to request a stool sample (ie. patient's age, travel, bloody stool, ..)?
- What percentage of those patients diagnosed with acute gastrointestinal illness is requested to submit a stool sample?
- Is there any follow-up (by physician) to a sample request?
- Can we determine how many of the requested samples actually are submitted?
- Is there an interest, on the part of the physicians, in the creation of an information network between the physicians, the hospitals and the Health Units within the province?

A unique physician code was attached to the survey return. This was matched to the physician's name, and was only used to ascertain responders and non-responders for follow up mailings, and to send a final report to those requesting one. No personal identifiers were included in any of the analyses or in this report.

Survey Application

Survey packages were mailed out on the 4th of May 2001. Each package contained a questionnaire, postage paid and addressed return envelope, and a cover letter describing the study and encouraging participation. A deadline for returns was given as the 21st of May 2001. Physicians were assured that all results would be presented in aggregate form, so that anonymity would be maintained. In order to geo-locate their location for mapping, physicians were also asked to supply the practice postal code.

The new city of Hamilton region was chosen as the pilot area for testing through a joint initiative with the Laboratory for Foodborne Zoonoses (Health Canada, Guelph, Ontario) and McMaster University. With this collaboration, it was possible to set up a pilot for both the population and physician survey tools and methodology. The population survey pilot was initiated in February 2001 and will finish in the spring of 2002.

This summary document will focus on the results from the physician survey pilot, which was initiated at the beginning of May 2001, with data collection completed by the end of June, 2001.

Two weeks after the initial mailing, a letter of encouragement was sent out to all participants. This letter thanked those who had already sent back their completed survey, and encouraged those who had not yet completed the questionnaire, to do so. Two weeks following the second mail out, a random list of 60 physicians was drawn from the non-responders, and practices were phoned to elicit participation. Several new surveys were faxed out as a result. A schematic is shown in Figure 2.

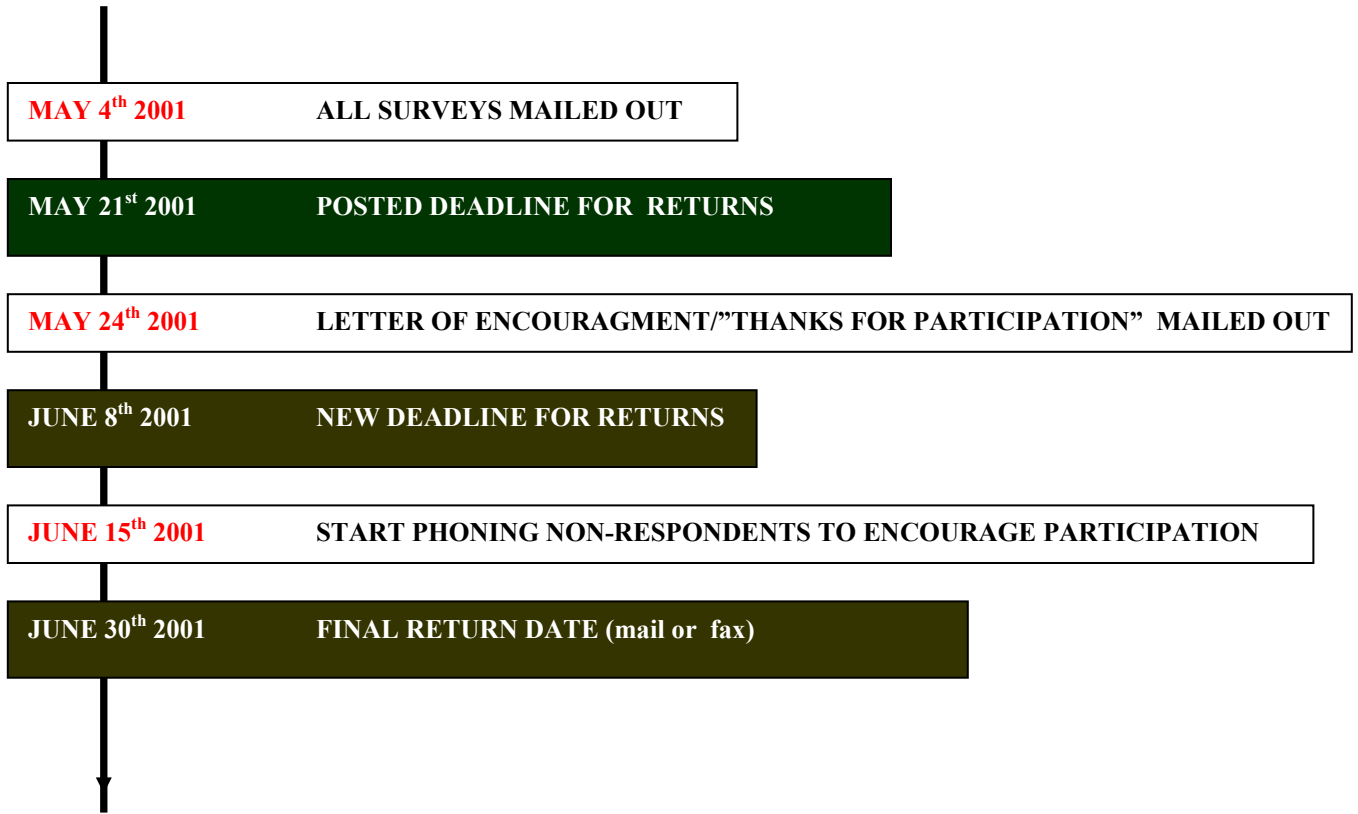


Figure 2. Schematic of the timeline for mailing out and following up the application of the physician questionnaire in the pilot undertaken in the new City of Hamilton.

Survey Response

Mailing lists that were provided contained 358 family physicians and 38 paediatricians. A number of surveys were returned within days of the initial mail out because of an incorrect address, or that the physician had moved.

As shown in Table 1, the final number of “eligible” family physicians and paediatricians was reduced to 305 and 24 respectively. Reasons for non-eligibility included:

- incorrect addresses / moved
- no longer in practice / retired
- actively seeing patients <8 hours per week
- specialist who does not do primary care
- <25% of patient base residing in the new City of Hamilton

Table 1. Respondent summary for physician survey pilot.

	Family Physician	Paediatrician	Total
Number sent	358	38	396
Number invalid/ineligible	53	14	67
Number eligible doctors	305	24	329
Number returns	85	11	96
%returns from eligible doctors	27.87	45.83	29.18

None of the physicians who were faxed new forms following the final phone solicitation returned a completed survey. The reasons for non-participation generally revolved around the lack of time and/or interest in the subject. Two physicians who were contacted stated that they never participated in surveys or studies of any kind.

The pattern of questionnaire returns is shown in Figure 3. By May 24th, 80% of the surveys that would be returned had been received. This represented approximately 26% of all known eligible physicians who were mailed a survey. The surveys that filtered in after that, represented 3% of the physician mailing pool.

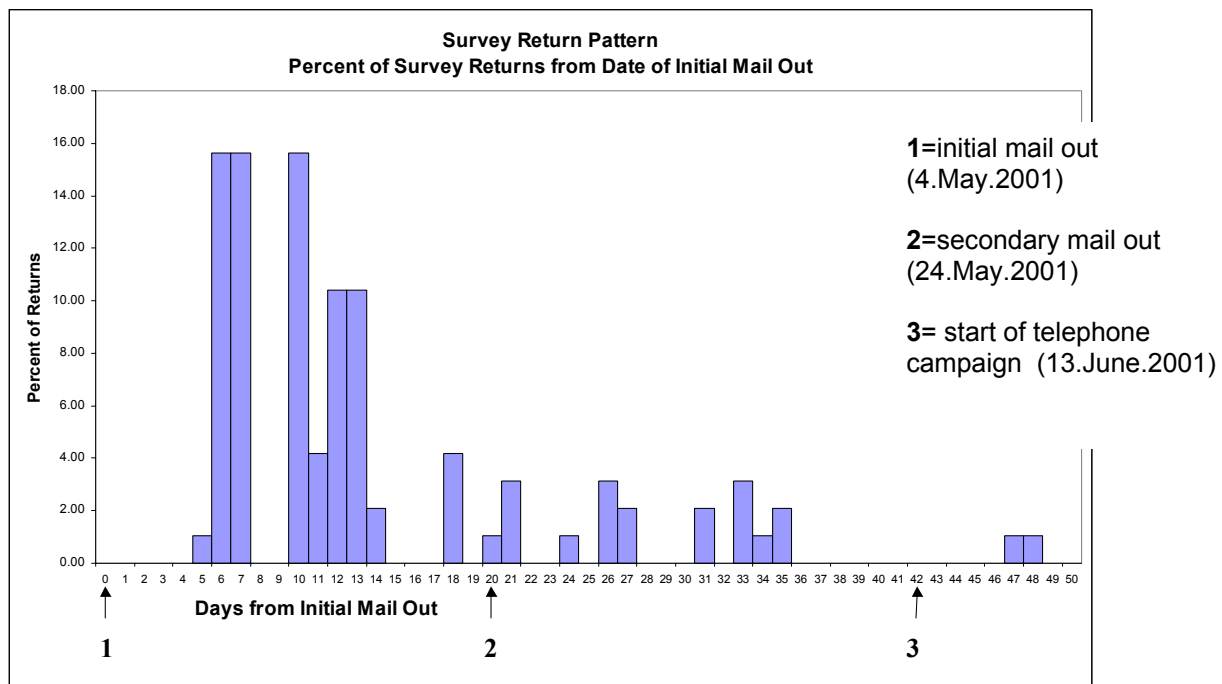


Figure 3. Pattern of returns for the physician mail out surveys for the New City of Hamilton.

Data Entry and Analysis

Upon receipt of the surveys, the information was entered into an Excel spreadsheet. Only the survey identifier numbers were attached to the records in this database; no names or addresses were entered. Postal codes were also included when supplied by the physician. Data were double entered, and reviewed to ensure quality of the database. All descriptive statistical analyses were done using the SAS[®] System.

Summary of Questionnaire Results.

Practice Statistics

The predominant practice type described by the returned surveys was *the community based family practice* (83%). Table 2 outlines the distribution of what the physicians considered to be their primary practice type.

Table 2. Distribution of Primary practice type of responding physicians in the New City of Hamilton.

<u>Primary Practice Type</u>	<u>% of Returns</u>
Family Community Based	83
Family Hospital Based	2
Paediatrician	11
Emergency	1
Other	3

Secondary definitions of the practices (provided by the responding physicians) included:

- consultant
- student health/university campus
- youth detention centre
- oncology consultant
- neurology consultant

Of the respondents, 60.42% were multi-physician practices. Two entries indicated patient base sizes of 6000 and 100 000 (institutions). Summarizing data on the remaining entries showed that the size of an individual physician's patient base ranged from 100 to 5000, with a mean of 1928 (+/- 772.37). The total number of patients

represented by those with patient bases smaller than 5000 was 163 960, which as a proportion of the 1996 census derived population (see Table 3), represented approximately 37% of the survey area inhabitants. Based on the census estimates for the population served by the Hamilton-Wentworth Public Health Unit (estimated as 481 531 in 1996 and 486 376 in 1997), this percentage would in reality be smaller for the year (2001) in which this study took place.

Table 3. Details of the 1996 census of the study area, including the city of Hamilton, Ancaster, Flamborough, Glanbrook and Stoney Creek.

Area	1996 Census Population
City of Hamilton	322 352
Ancaster	23 403
Flamborough	34 037
Glanbrook	10 564
Stoney Creek	54 318

When asked what percentage of their patient base lived in the new city of Hamilton area, 74.47% of the respondents judged that it was “between 75 and 100%”. The distribution of this variable is given in Table 4.

Table 4. Distribution of percentage of patient base living in the Hamilton area.

% of Patient Base Residing in Hamilton Region	Percent of Respondents
Unknown	4.26
0-25%	1.06
>25-50%	2.13
>50-75%	4.26
>75-100%	74.47
100%	13.83

To provide consistency in the physicians’ understanding of what was considered to be ‘acute gastrointestinal illness’, the following definition framed by the CDC FoodNet study was supplied in the questionnaire:

Definition of Acute Gastrointestinal Illness:

Three or more loose stools in 24 hours; or diarrhea with two additional gastrointestinal symptoms (vomiting, nausea, fever, abdominal cramps, abdominal pain, blood in stool); or vomiting with two additional gastrointestinal symptoms (diarrhea, nausea, fever, abdominal cramps, abdominal pain, blood in stool) preceded by a period of 2 weeks symptom-free.

Table 5 compiles the results describing the approximate number of patients seen by the responding physicians in the last month (in the 30 days prior to receiving the questionnaire), and of those, how many were diagnosed with acute gastroenteritis. Further to this, the physician was asked to approximate how many stool samples were requested of those diagnosed with acute gastrointestinal illness. Physicians were not asked to refer to their records in providing this information.

For this discussion, physician patient information was excluded when the number of patients in an individual physician’s patient base exceeded 5,000. If more patients were diagnosed with acute GI than were actually seen, the information was also discarded. Similarly, the patient record information was removed if more stool requests were made than patients diagnosed with GI.

Table 5. Patient activity information for the new City of Hamilton pilot study.

	Total	Mean	Std. Dev	Min	Max
Number of patients seen in last 30 days.	38727	425.57	301.52	0	1200
Of patients seen in last 30 days, how many were diagnosed with acute GI?	1298	14.91	13.25	0	60
<i>Percent diagnosed with acute GI of those seen in last 30 days:</i>				3.35%	
Of those diagnosed with acute GI, how many were asked to submit stool?	290	3.26	4.19	0	20
<i>Percent of those diagnosed with acute GI requested to submit stool sample:</i>				22.34%	

Signs and Symptoms

Physicians were provided with a list of 17 potential signs and symptoms that might prompt them to request a stool sample. The importance of that sign or symptom was based on a score that reflected whether the physician would “Always” ask for a sample, ranging through to “Never” or “Irrelevant”.

Their responses (as a percentage of total responses for each category) are given in Table 6 (page 13).

Further to this, physicians were asked to provide other signs or symptoms that were not listed and that they considered as being important in prompting a stool sample request.

The following are a summary:

- recent antibiotic use
- symptoms persist longer than 7-10 days
- unusual presentation
- family history of inflammatory disease
- previous history of enteric pathogen
- convenience re:laboratory availability
- travel; travel to hot location
- drinking well water
- eating out; eating in unclean restaurant
- severity of several symptoms
- household outbreak; family members sick with similar illness
- combination of some of the signs and symptoms listed

Table 6. Distribution of responses to a list of impact of signs and symptoms that would prompt a stool sample request.

	Always (100%)	Often (≥80% & <100%)	Sometimes (≥20% & <80%)	Rarely (>0 & <20%)	Never (0%)	Irrelevant	Number of Responses
a. Duration of illness (<2 days)	1.1	4.4	6.59	46.15	39.56	2.2	91
b. Duration of illness (2-5 days)	1.09	7.61	25	43.48	21.74	1.09	92
c. Duration of illness (>5 days)	9.78	34.78	35.87	15.22	3.26	1.09	92
d. Fever (≥38°C)	5.38	19.35	39.78	29.03	4.3	2.15	93
e. Bloody Diarrhea	51.61	33.33	7.53	6.45	-	1.08	93
f. Abdominal Pain	2.17	10.87	39.13	40.22	2.17	5.43	92
g. Clinical Dehydration	13.04	20.65	38.04	19.57	2.17	6.52	92
h. Patient Request	21.74	16.3	29.35	27.17	2.17	3.26	92
i. Recent Camping Trip	17.2	39.78	31.18	10.75	1.08	-	93
j. Recent Travel Overseas	39.78	35.48	19.35	5.38	-	-	93

Table 6. (cont.)

	Always (100%)	Often (≥80% & <100%)	Sometimes (≥20% & <80%)	Rarely (>0 & <20%)	Never (0%)	Irrelevant	Number of Responses
k. Outbreak Associated	38.46	27.47	24.18	6.59	1.1	2.2	91
l. Age of Patient (≤1 yr)	6.45	16.13	36.56	32.26	4.3	4.3	93
m. Age of Patient (>1 & ≤5 yrs)	-	16.13	35.48	38.71	4.3	5.38	93
n. Age of Patient (>5 & ≤65 yrs)	2.15	10.75	39.78	38.71	2.15	6.45	93
o. Age of Patient (>65 yrs)	4.44	11.11	47.48	24.44	4.44	7.78	90
p. Immunocompromised Patient	32.97	43.96	13.19	4.4	-	5.49	91
q. Occupational Situation (ie Day Care Worker, Food Handler,...)	25	43.48	20.65	5.43	1.09	4.35	92

The five factors that seemed to be of the most concern were:

- Bloody Diarrhoea (84.94% response)
- Immunocompromised (76.93% response)
- Recent Travel Overseas (75.26% response)
- Occupational Situation (68.48% response)
- Outbreak Associated (65.93% response).

These were determined by looking for more than a 60% response rate when combining the two columns of “ALWAYS” and “OFTEN” (thus a request for stool would be made *at least 80% of the time*).

The factors that seemed to be of least concern are those that exceeded a 40% response rate when combining the RARELY+NEVER columns (thus a stool request would be made *at the most, 20% of the time*) were:

- Duration of illness <2 days (85.71% response)
- Duration of illness 2-5 days (65.22% response)
- Age of patient >1 & ≤ 5 years (43.01% response).

An obvious disadvantage of a chart of this sort is that it precludes identifying any *combinations* of symptoms that would affect the decision to request a stool sample. A means of dealing with this would be to present a different type of question regarding signs and symptoms. One approach would be to present the physicians with a number of “case scenarios”, and ask them to respond with the likelihood of requesting a stool sample under that scenario. Alternately, given a prompt list, the physicians could be asked to provide descriptions of sign and symptom scenarios (combinations) that would elicit a request for a stool sample.

Stool Sample Submission Habits and Perceptions

The next section of the questionnaire focussed on stool sample submission habits and perceptions.

When asked to approximate how often a stool sample would be requested from patients diagnosed with acute gastrointestinal illness, 52% of the respondents approximated that this would occur up to 20% of the time, which was very much in accordance with the overall study tabulated value of 22.34%. The tabulated outcomes for this are given in Table 7.

Table 7. The approximate percentage of patients diagnosed with acute GI from whom physicians would request a stool sample.

% of diagnosed patients asked to submit stool	% of respondents
0-20%	52.17
>20 & ≤40%	17.39
>40 & ≤60%	14.13
>60 & ≤80%	7.61
>80%	5.43
Don't know	3.26

Table 8 outlines physicians' perceptions on patient compliance with regards to stool submission. Comments regarding the reasons for lack of compliance follow the table.

Table 8. Physicians' estimations of percent of patient compliance in stool sample submission.

% of patients complying when asked to submit stool	% of respondents
0-20%	3.2
>20 & ≤40%	11.83
>40 & ≤60%	21.51
>60 & ≤80%	35.48
>80%	29.03

Possible reasons given by the physicians for the lack of compliance are compiled below:

- patient got better
- messy; embarrassing; disgusted with task; unpleasant to collect; queasiness with task
- difficulty in correctly collecting the stool / spoiled sample
- too complicated for individual to perform
- instructions too complicated / didn't understand instructions
- patient ill informed / does not understand why it is necessary
- inconvenience with regards to getting sample to lab/ interim storage of sample at home
- "socio-economic disinterest"

With regards to the follow-up procedure upon requesting a sample, physicians were asked if their practice would contact the patient if:

- a. the patient did not submit a sample
- b. the sample results were negative
- c. the sample results were positive for a reportable pathogen

A summary of the results for these scenarios is assembled in Table 9.

Table 9. Physician follow-up practices with patients regarding sample submissions.

% of respondents within each category

Frequency of Action	Contact patient if no sample results received.	Contact patient if sample results are negative.	Contact patient if sample results are positive for reportable.
Never (0%)	27.66	15.96	-
Rarely (0-20)	35.11	29.79	2.1
Sometimes (>20 & ≤80)	25.53	24.47	-
Nearly Always (>80 & ≤100)	10.64	20.21	6.32
Always (100%)	1.06	9.57	91.58

Questions that pertained to the physician practice contact with the local Public Health Unit included queries regarding reporting cases under the following circumstances:

- a. a reportable gastrointestinal illness (eg. *Salmonella*)
- b. a non-reportable gastrointestinal illness (eg. *Staphylococcus aureus*)
- c. suspect food poisoning
- d. acute gastrointestinal illness, unknown organism, isolated case
- e. acute gastrointestinal illness, unknown organism but part of a household cluster
- f. acute gastrointestinal illness, unknown organism but part of a possible foodborne outbreak
- g. food handler with acute gastrointestinal illness

The responses to these questions are summarized over Tables 10a and 10b. Ninety percent of physicians would contact the Public Health Unit more than 80% of the time if a reportable organism were isolated in their patient's stool. It is important to note that some physicians indicated that this was an understood responsibility of their testing laboratory. It was found that 57% of physicians would contact the Public Health Unit

more than 80% of the time if they were presented with a case of acute gastrointestinal illness with an unknown organism, but as part of a possible foodborne outbreak. If the occupation of a patient diagnosed with acute gastrointestinal illness involved handling food, 54% of respondents said that they would contact the Public Health Unit “more than always” or “always”.

Table 10a. A summary of physician contact with the local Public Health Unit .

% of respondents in each category

Frequency of Action	Contact PHU if reportable GI illness	Contact PHU if non-reportable GI illness	Contact PHU if suspect food poisoning	Contact PHU if acute GI; unknown org; isolated case
Never (0%)	2.15	45.45	15.56	48.89
Rarely (0-20%)	1.08	35.23	20.00	36.67
Sometimes (>20 & ≤80%)	7.53	15.91	32.22	5.56
Nearly Always (>80 & ≤100%)	19.35	1.14	18.89	6.67
Always (100%)	69.89	2.27	13.33	2.22

Table 10b. A summary of physician contact with the local Public Health Unit (cont.).

% of respondents in each category

Frequency of Action	Contact PHU if acute GI; unknown org; household cluster	Contact PHU if acute GI; unknown org; part of possible foodborne outbreak	Contact PHU if acute GI in food handler
Never (0%)	29.67	3.37	7.69
Rarely (0-20 %)	38.46	11.24	13.19
Sometimes (>20 & ≤80%)	14.29	28.09	25.27
Nearly Always (>80 & ≤100%)	13.19	29.21	17.58
Always (100%)	4.4	28.09	36.26

Physicians' perceptions as to what the testing laboratory actually does with a stool sample were summarized. Table 11 shows the percent of physicians' responses for each category, to the following question:

“When you order a stool sample for bacterial culture, and you do not make any specific requests, is it your understanding that the routine lab screening always test for the following pathogens?”

Table 11. Physicians’ perceptions regarding whether routine laboratory testing always tests for the following pathogens.

Pathogen	Yes	No	Don’t Know
<i>Salmonella</i>	95.7	3.2	1.1
<i>Campylobacter</i>	90.4	7.4	2.2
<i>Shigella</i>	88.0	4.3	7.6
<i>Vibrios (eg Cholera)</i>	30.0	17.8	52.2
<i>E.coli O157</i>	74.5	6.4	19.1
<i>E. coli non-O157</i>	44.3	19.3	36.4
<i>Yersinia</i>	67.4	8.7	23.9

A summary of what the physicians specifically ask the laboratory to test for when submitting a stool sample is given in Table 12.

Table 12. Description of what physicians specifically request when submitting stool samples for testing.

	Percent response for each category				
	Always (100%)	Often (>80 & ≤100)	Sometimes (>80 & ≤100)	Rarely (>0 & ≤20)	Never (0%)
Bacteria	58.06	21.51	8.6	4.3	7.53
Viruses	5.95	11.9	8.33	36.9	36.9
Parasites	53.76	32.26	5.38	3.23	5.38

The final question on the survey addressed physicians’ interest in setting up an information network between physicians, hospital and Health Units within the province. Such a web-based secure network would be exceedingly useful for all parties involved, in dissemination of health information, trends, keeping abreast of local and provincial issues, and allowing a faster exchange of information.

Of 94 respondents to this question, 90% indicated that they would like to see a web based network created.

Final Remarks

As indicated in the introduction to the National Studies on Acute Gastrointestinal Illness (NSAGI), this survey will be rolled out at a national level to a number of different

communities. As funding and opportunity becomes available, provinces will be recruited to take part in the population and physician surveys. The provinces will be requested to provide three communities whose Health Units are keen to participate and whose demographics fit the requirements (one urban, one rural, one urban/rural). Each of the health units and the province will be encouraged to include questions on the surveys that specifically pertain to their health environment.

Eventually, an assimilation of provincial data will provide a national picture of gastrointestinal disease and its impact at both the population and the physician level. Inevitably the goal of the NSAGI project is to use the gathered baseline information against which the effect of public health programmes, interventions, and preventions will be measured. Future plans are for collaborative etiological, chronic sequelae, and risk factor studies.

Similar studies are taking place in the United States (CDC FoodNet), Australia (OzFoodNet) and in Ireland (Food Safety Authority of Ireland). Previous studies on ascertaining the level of gastroenteritis in the population, under reporting through the reporting chain, and the establishment of sentinel physician sites have taken place in the Netherlands (Hoogenboom-Verdegaal *et al* 1994; deWit *et al* 2001), England (Roderick *et al*, 1994; Tompkins *et al* 1999; Wheeler *et al* 1999; Sethi *et al* 1999a; Sethi *et al*, 1999b), and Wales (Palmer and Smith, 1991; Chalmers and Salmon 2000; Thomas *et al* 1998). Efforts to foster international collaboration with the researchers involved in a number of these studies are ongoing.

As a result of the pilot in the new city of Hamilton, changes will be made to improve the readability of the survey and to alter some of the options for the question regarding signs and symptoms that prompt stool requests. Physicians will also now be asked to provide a combination of signs and symptoms (in a free text format) that would prompt them to ask for a stool sample more than 80% of the time.

The first province that will take part in the NSAGI rollout will be British Columbia. The surveys will be initiated in the three chosen communities at the beginning of April 2002.

Acknowledgements

Sincere thanks to the participating physicians of the new City of Hamilton who took time out of their extremely busy schedules to complete the survey and send it in. Your responses and comments were very much appreciated.

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Appendix List

- **Appendix 1.** All free text responses to Question 8r.
Please list any other factors that would influence your decision to ask for a stool sample.
- **Appendix 2.** All free text responses to Question 11.
In your opinion, what might be the reason(s) for non-compliance?
- **Appendix 3.** All free text responses to Question 14.
When you order a stool sample for bacterial culture, and you do not make any specific requests, is it your understanding that the routine lab screening always test for the following pathogens? Any others that are not listed here?
- **Appendix 4.** The questionnaire that was used for this pilot (7pages).
- **Appendix 5.** Map of the new City of Hamilton region with locations (by postal code) of participating physicians.

APPENDIX 1.

Physician comments from free text area for questions regarding signs and symptoms that would prompt a request for a stool sample.

Q8r. Please list any other factors that would influence your decision to ask for a stool sample.

- travel - location dependent
- household epidemic; travel to hot location
- recurrent - knowing the patient
- duration or severity of GI diagnoses
- return from overseas/warm country
- prolonged illness
- prolonged illness; contacts of bacterial gastroenteritis
- duration of illness; stool free; odour; recently in hospital; antibiotic use
- severity/duration/fever/context
- longer than 2 weeks; weight loss; family members sick w similar illness
- relate to eating certain foods; chicken, poorly washed meat; outbreak at single restaurant
- frequency of stool; patient discomfort; travel; public eating; drinking well water
- unusual presentation
- diarrhoea persists
- bloody diarrhoea ≥ 7 Days; patients health status; travel history
- previous history of enteric pathogen
- recent antibiotic use
- greater than 10-14d always
- any symptoms persisting > 10 d
- recent antibiotic use (ie for C.difficile+toxin)
- fever; failure to respond to treatment; bloody stool; increase in pain; dehydration; late onset vomiting
- severity or length of illness; clinical regimen; travel; antibiotic use (C. difficile)
- bloody diarrhoea; travel outside country; eating out day before
- living on farm w well water; working in sewage
- city water vs well water
- eating out
- low grade chronic symptoms
- severity of symptoms
- drinking well water
- history of recent tx with antibiotics
- bloody diarrhoea; prolonged diarrhoea; requiring hospitalisation
- diarrhoea persists > 7 d; recent antibiotic exposure
- duration; blood
- eating in unclean restaurant; food tasting 'funny'

APPENDIX 1. (cont.)

- antibiotic use
- convenience re:laboratory availability
- mucous and/or pus in stool; symptoms>7d; family history of colitis; Crohnes
- failure to resolve in 7+ days; clinically deteriorating health symptoms
- history of culture positive for gastrointestinal illness; recent discharge from hospital
- some consultants prefer stool samples before they see the patient
- foreign travel including southern US; overseas visitors; multiple family members ill; cottage
- combinations of factors
- family history of inflammatory disease
- extensive illness; HUS; Salmonella; Shigella; first examples in outbreak; unusual situation; contaminant considered
- duration of illness; fever; co-morbid conditions
- most episodes relate to chemotherapy
- mucous in stool
- ethnic origin; recent immigrant from outlying areas with well water
- child is hospitalised w dehydration; stool for virology is typically sent to follow local epidemiological trends and provide prognostic information

APPENDIX 2.

Physician comments from free text area for questions pertaining to stool sample requests.

Q11. In your opinion, what might be the reason(s) for non-compliance?

- too messy/too stinky
- did not like to do it
- lack of insight
- unpleasant to do; symptoms resolve
- quick improvement of symptoms
- patients find it messy or 'gross'; samples have to be refrigerated if not immediately taken to lab

- difficulty to collect samples especially if liquid toilet; labelling the jar
- nature of sample
- stool can't touch water
- don't like collecting samples; patients consider it messy
- symptoms resolved
- keeping samples over weekend
- patients may find logistics of collection a problem
- its messy

- time; patient discomfort with test
- handling faeces; inconvenience of second trip to lab

- got better
- gets better; not comfortable collecting stool
- patient reluctant to collect samples
- patient is clinically better
- not good instruction; difficult to get
- got better; disgusted with procedure
- indifference; recovery
- messy process
- complicated instructions; having to pick up bottles from lab and return to lab
- symptoms resolve; unpleasant to collect sample
- illness/symptoms resolved
- method of collection
- the procedures
- methods to obtain stool (ie not in treated water)
- symptoms resolved
- symptom resolution; queasiness
- bothersome to collect; inconvenient to take to lab
- probably an unfamiliar and unpleasant test
- patient comfort
- resolution or rapid resolving of illness; messy and embarrassing
- failure to communicate need

APPENDIX 2. (cont.)

- problems getting sample back to lab
- too messy; patient gets better
- symptoms resolved
- unpleasant task of collecting specimen
- dislike of tush; inability to do it properly; not understanding importance
- embarrassed
- in 27 yrs pts have never been non compliant for stool sample because they see that I am concerned

- improvement of symptoms
- too complicated to do; improved symptoms
- illness resolved spontaneously
- if educated population of patients - all complete if explain clearly why and how to do it
- collection technique - getting close to stool; storage before bringing to lab
- resolution of symptoms; reluctance to collect sample and bring to lab - very cumbersome
- illness resolves spontaneously; pt does not like process of stool sample collection; inconvenience

- got better; squeamish
- messy process; unpleasant
- difficulty in collecting samples (soaks into diapers); resolution of illness
- difficulty in collection and mixing with preservative
- symptoms resolve; not clear how to collect; aversion to faeces collection
- inconvenience; embarrassment
- inconvenience
- symptoms resolved
- don't understand collection bottle protocol
- symptoms resolve; inconvenient lab hours for sample drop off
- embarrassment
- unpleasant task of collecting specimen
- unpleasantness of sample collection
- prudery; distaste for sampling; socio-economic disinterest
- MD strongly urges (almost demand) that patients comply
- pharmacy intervention; natural remedies; stupidity
- collecting methods and inconvenience of returning to lab
- got better
- in hospital so Q9 and Q10 slightly diff spin
- difficulty of collecting sample; recovery from symptoms
- difficulty in obtaining test; self treated; short duration of illness
- embarrassment; patient ill informed as to req't
- diarrhoea resolved; difficulty in obtaining sample
- got better wo tx; tests performed if hospitalised
- the ones I order are generally hospital-based, and are therefore collected by nursing staff
- stools are 'icky'

APPENDIX 3.

Physician comments from free text area for questions regarding signs and symptoms that would prompt a stool sample request.

Q14. When you order a stool sample for bacterial culture, and you do not make any specific requests, is it your understanding that the routine lab screening always test for the following pathogens? Any others that are not listed here?

- parasites
- C.difficile
- if C. difficile requested
- giardia
- ask for C.difficile
- C.difficile ordered separately
- Candida; Staph overgrowth

APPENDIX 4. Survey used in the Physician Survey Pilot Study.

PRIMARY PHYSICIAN SURVEY QUESTIONNAIRE

Today's Date: (Day/Month/Year) _____

Name: _____

Practice Address: _____

_____ Postal Code: _____

Are you directly involved in patient care for at least 8 hours per week on average?

yes **→** Please proceed with questionnaire

no **→** Please stop here and return questionnaire in enclosed envelope.

Thank you for your contribution..

This survey is part of an initiative by Health Canada to study gastrointestinal illness in the community. By surveying all family practices in the new City of Hamilton, we hope to get an idea of the patient load that physicians face due to this illness, and to determine the general protocol followed by practitioners upon diagnosis. All submissions will be strictly confidential, and any results will only be presented in an aggregate format.

1. Which of the following best describes your primary practice?

(please check all that apply)

Family/General Practice in Private Office

Pediatric Practice in Private Office

Emergency Department Practice

Walk-in Clinic

Other

please specify: _____

2. Besides yourself, are there other physicians in your practice?

yes no

3. Approximately how big is your own patient base? _____

(number of patients)

4. Approximately what percentage of your patient base lives in the new City of Hamilton (Glanbrook, Stoney Creek, Dundas, Ancaster, Flamborough, Hamilton)?

(please check appropriate response)

- 100%
- ≥ 75 and $< 100\%$
- ≥ 50 and $< 75\%$
- ≥ 25 and $< 50\%$
- $< 25\%$
- Don't know

Definition of Acute Gastrointestinal Illness:

Three or more loose stools in 24 hours; or diarrhea with two additional gastrointestinal symptoms (vomiting, nausea, fever, abdominal cramps, abdominal pain, blood in stool); or vomiting with two additional gastrointestinal symptoms (diarrhea, nausea, fever, abdominal cramps, abdominal pain, blood in stool) preceded by a period of 2 weeks symptom-free.

5. In the last 30 days, how many patients IN TOTAL have been seen by you, including those seen by your nurse?

Number of patients: _____

6. Of those patients seen in the last 30 days, how many have been diagnosed with symptoms of acute gastrointestinal illness?

Number of patients: _____

7. Of those patients seen in the last 30 days and diagnosed with acute gastrointestinal illness, how many were requested to submit a stool sample?

Number of patients: _____

8. In a patient *diagnosed with acute gastrointestinal illness*, how likely is it that you would request a stool sample for laboratory diagnosis for the following conditions?

- Always (100% of the time)
- Often ($\geq 80\%$ and $< 100\%$ of the time)
- Sometimes ($\geq 20\%$ and $< 80\%$ of the time)
- Rarely ($< 20\%$ of the time)
- Never (0%)
- Irrelevant (Not relevant to stool sample request)

(please circle the appropriate answer)

	Always (100%)	Often (≥20% & <80%)	Sometimes (≥20% & <80%)	Rarely (<20%)	Never (0%)	Irrelevant
<i>a.</i> Duration of illness (<2 days)	1	2	3	4	5	6
<i>b.</i> Duration of illness (2-4 days)	1	2	3	4	5	6
<i>c.</i> Duration of illness (>5 days)	1	2	3	4	5	6
<i>d.</i> Fever (≥38°C)	1	2	3	4	5	6
<i>e.</i> Bloody Diarrhea	1	2	3	4	5	6
<i>f.</i> Abdominal Pain	1	2	3	4	5	6
<i>g.</i> Clinical Dehydration	1	2	3	4	5	6
<i>h.</i> Patient Request	1	2	3	4	5	6
<i>i.</i> Recent Camping Trip	1	2	3	4	5	6
<i>j.</i> Recent Travel Overseas	1	2	3	4	5	6
<i>k.</i> Outbreak Associated	1	2	3	4	5	6
<i>l.</i> Age of Patient (≤1 yr)	1	2	3	4	5	6
<i>m.</i> Age of Patient (>1 & ≤5 yrs)	1	2	3	4	5	6
<i>n.</i> Age of Patient (>5 & ≤65 yrs)	1	2	3	4	5	6
<i>o.</i> Age of Patient (>65 yrs)	1	2	3	4	5	6
<i>p.</i> Immunocompromised Patient	1	2	3	4	5	6
<i>q.</i> Occupational Situation (ie Day Care Worker, Food Handler,...)	1	2	3	4	5	6

r. Please list any other factors that would influence your decision to ask for a stool sample.

9. In general, of patients diagnosed with symptoms of acute gastrointestinal illness, approximately what percentage is requested to submit a stool sample?

(please check appropriate response)

- > 80 and \leq 100%
- > 60 and \leq 80 %
- > 40 and \leq 60%
- > 20 and \leq 40%
- 0 - 20%
- don't know

10. What do you believe best describes the rate of patient compliance in submitting a stool sample when one has been requested?

(please check appropriate response)

- excellent (> 80 and \leq 100%)
- very good (> 60 and \leq 80 %)
- good (> 40 and \leq 60%)
- poor (> 20 and \leq 40%)
- very poor (0 - 20%)
- don't know

11. In your opinion, what might be the reason(s) for non-compliance?

12. In the situation where a stool sample has been requested, what best describes how frequently your practice would do the following ...

a. *When no laboratory results are received within 2 weeks, your practice will contact the patient to check that a sample was submitted.*

(please check appropriate response)

- always (100%)
- nearly always (≥ 80 and $< 100\%$)
- sometimes (≥ 20 and $< 80\%$)
- rarely ($< 20\%$)
- never (0%)

b. *When negative results are received from the laboratory, your practice will contact the patient with this information.*

(please check appropriate response)

- always (100%)
- nearly always (≥ 80 and $< 100\%$)
- sometimes (≥ 20 and $< 80\%$)
- rarely ($< 20\%$)
- never (0%)

c. *When positive results for reportable pathogens are received from the laboratory, your practice will contact the patient with this information.*

(please check appropriate response)

- always (100%)
- nearly always (≥ 80 and $< 100\%$)
- sometimes (≥ 20 and $< 80\%$)
- rarely ($< 20\%$)
- never (0%)

13. How often, in the following situations, would you report illnesses to the local Public Health Unit?

(please check appropriate response)

	Always (100%)	Often (≥80% & <100%)	Sometimes (≥20% & <80%)	Rarely (<20%)	Never (0%)
a. A notifiable gastrointestinal illness. (eg. <i>Salmonella</i>)	1	2	3	4	5
b. A non-notifiable gastrointestinal illness. (eg. <i>Staphylococcus aureus</i>)	1	2	3	4	5
d. Suspect food poisoning.	1	2	3	4	5
e. Acute gastrointestinal illness, unknown organism, isolated case.	1	2	3	4	5
e. Acute gastrointestinal illness, unknown organism but part of a household cluster.	1	2	3	4	5
f. Acute gastrointestinal illness, unknown organism, but part of a possible foodborne outbreak.	1	2	3	4	5
g. Food handler with acute gastrointestinal illness.	1	2	3	4	5

14. When you order a stool sample for bacterial culture, and you do not make any specific requests, is it your understanding that the routine lab screening always test for the following pathogens? (please check appropriate response)

Salmonella	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> don't know
Campylobacter	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> don't know
Shigella	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> don't know
Vibrios	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> don't know
E.coli O157	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> don't know
Non O157 E. coli	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> don't know
Yersinia	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> don't know
Other	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> don't know

If yes to "Other" ...please list: _____

15. In general, of the stool samples that you request, how often do you specifically ask the laboratory to test for (please circle appropriate response) :

	Always (100%)	Often (≥80% & <100%)	Sometimes (≥20% & <80%)	Rarely (<20%)	Never (0%)
<i>Bacteria</i>	1	2	3	4	5
<i>Viruses</i>	1	2	3	4	5
<i>Parasites</i>	1	2	3	4	5

16. Some regions have developed a web-based, secure information network between physician practices, hospital emergency rooms and the local health unit, which is used to help monitor trends in infectious enteric illness. Such a network may integrate information such as weekly aggregate data on specific diseases and culture results, and provide updates on outbreaks.

Would you support the development of a similar system in your area?

yes no already exists

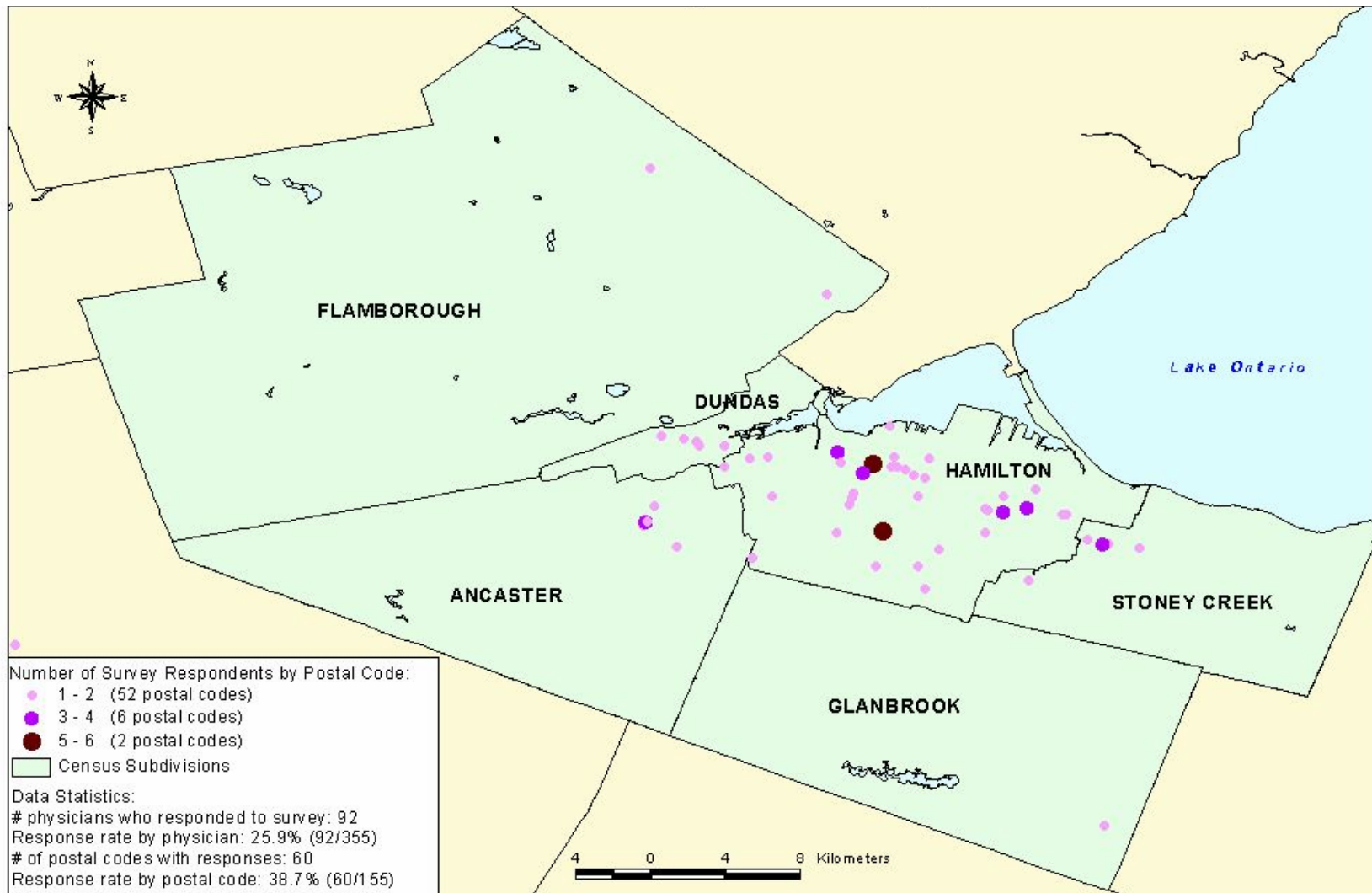
17. Would you be interested in receiving educational material for your practice regarding diagnosis and management of foodborne illnesses?

yes no

COMMENTS:

*Thank you very much for your time and contribution to this study.
Please return your completed survey using the enclosed stamped and addressed envelope.*

APPENDIX 5. Map of the new City of Hamilton region indicating the location (by postal code) of physicians who participated in the physician survey pilot. There were 96 respondents of whom 4 did not include a postal code.



Note: One survey respondent's postal code is in Brantford, Brant County and has been counted in these statistics.
 *Survey period was from May through June 2001 and is part of a joint project between Health Canada and McMaster University.