ABSTRACT

This research project was conducted in the Ottawa-Carleton region of Ontario to provide information on reasons why students did not participate in a Grade 7 hepatitis B school immunization project, and to determine whether telephone contact increased attendance at the community catch-up clinics above that achieved by a notice sent home with the child from school. A matched comparison group design was used.

The overall uptake of the first dose of the vaccine in the region was 94% of 8,560 eligible students; 90% were immunized at the school clinic and 4% at the community catch-up clinic. About 4% of the parents refused to have their child immunized at the school or catch-up clinics. Of parents in the intervention group 198 (95%) were contacted by phone. The major reasons for non-participation at the school clinics were: (1) the child was not at school on the clinic day, or the child was sick (51%), (2) there were problems with the consent form (21%), and (3) the parents did not know of the program (10%). More students from the intervention group (72%) came for vaccination than did those of the control group (50%) ($p < 0.01$).

ABRÉGÉ

Le présent projet de recherche a été mené dans la région d'Ottawa-Carleton, en Ontario, dans le but d'expliquer pourquoi des élèves de 7^e année n'ont pas participé à la séance de vaccination contre l'hépatite B tenue à l'école et de déterminer, en faisant appel à des groupes de référence appariés, si le rappel téléphonique a été un moyen plus efficace que les lettres données aux parents par l'intermédiaire des enfants pour accroître le taux de participation aux séances de vaccination dans la collectivité.

Dans la région, 94 % des 8 560 élèves admissibles ont reçu la première dose du vaccin. De ce nombre, 90 % se sont présentés à la séance de vaccination à l'école et 4 % sont allés à la séance organisée dans la collectivité. Environ 4 % des parents ont refusé que leur enfant soit immunisé lors des séances tenues à l'école ou dans la collectivité. Cent quatre-vingt-dix-huit parents du premier groupe (95 %) ont été joints par téléphone. Tous les élèves n'ont pas participé à la séance de vaccination à l'école principalement parce que certains élèves étaient absents ou malades le jour de la séance (51 %), les formulaires de consentement posaient des problèmes (21 %) et des parents ignoraient l'existence du programme (10 %). Un plus grand nombre d'élèves du premier groupe (72 %) que d'élèves du second groupe (50 %) ($p < 0,01$) s'est présenté à la séance.

School-based Hepatitis B Immunization Program: Follow-Up of Non-participants at First School Clinic

Paula Stewart, MD, FRCPC,¹ Noni MacDonald, MD, FRCPC,² Ian Manion, PhD²

By the early 1990s, the increasing rates of acute hepatitis B and deaths due to hepatitis B clearly showed that the hepatitis B vaccine strategy aimed at high risk individuals and practised over the preceding decade was failing to stem the tide of hepatitis B infection in Canada.¹ On review of the data both the National Advisory Committee on Immunization and the Canadian Paediatric Society endorsed the principle of universal childhood immunization.²⁻⁴ The hepatitis B working group recommended a universal pre-adolescent program as the most cost-effective alternative to augment the current selective program.⁵

British Columbia initiated the first universal in-school program in Canada in 1992 and had an uptake of over 90% for the first dose among grade 6 students.⁶ A similar pre-adolescent school-based program in San Francisco, Baton Rouge and selected sites in Oregon in 1992 through 1994 had uptake rates of 72 to 79% for the first and 66 to 78% for the third dose.⁷

The Ontario Ministry of Health initiated a province wide, no charge, universal hepatitis B vaccine school program for grade 7 students in the fall of 1994 implemented by local health units. The objectives of this study were to determine first why children did not receive the first dose of the hepatitis B vaccine at the school clinic, and second whether a brief tele-

phone interview with the parents/guardians of non-participating students could increase attendance at hepatitis B vaccine catch-up clinics.

Program description

In the Ottawa-Carleton region, the hepatitis B immunization program included an in-class education program given by a public health nurse, a student information pamphlet, and a parent information pamphlet, which included the consent form. Immunization clinics were provided in every school during school hours. The students who did not attend the clinic were given a letter to take home, giving the specific date, place and time of the community catch-up clinic. Although a formal media campaign was not developed for the program, the local media did cover the story as a news item.

Evaluation methods

The study had two components. First, a telephone survey was conducted among parents of students who had not attended the school clinic for the first dose of hepatitis B vaccine. A number of schools stratified by place (urban/suburban/rural) and school board (public/separate; English/ French) in the Ottawa-Carleton region were randomly selected for the survey. Students whose parents had actively refused consent for the hepatitis B program, and those who had already received vaccine or who were referred to their physician for vaccine were not eligible for the study. All the questions in the survey were fixed choice except for the question on reasons for not participating in the school clinic, which was open-ended. Knowledge about hepatitis B was assessed by means of true/false questions. If the par-

1. Ottawa-Carleton Health Department

2. Children's Hospital of Eastern Ontario

Funded by the Public Health Branch, Ontario Ministry of Health

Presented in part at the annual meeting, Society for Pediatric Research, May 1995. San Diego, California.

Correspondence and reprint requests: Dr. P. Stewart, Ottawa-Carleton Health Department, 495 Richmond Road, 6th Fl.W., Ottawa, ON K2A 4A4, Tel: 613-724-4122, ext 3713, Fax: 613-724-4191

ent did not have time to complete the full questionnaire, the interviewers were instructed to first ask the questions about the reason why the child did not participate in the school clinic. This ensured the maximum information possible for the primary research question but did result in a lower number of responses to the later questions. Upon completion of the questionnaire, the parent/guardian was informed about the time and place of the catch-up clinic and offered the opportunity for a nurse to call if there were further questions about the vaccine program.

The second component of the study compared the impact on attendance at the community catch-up clinics of two interventions: a telephone call plus a letter sent home with the child about the catch-up clinics, and the letter only. The intervention schools were matched with similar schools in the same board and area to create a comparison group. All eligible (as already defined) students in these schools who had not participated in the in-school clinics were included in the study. The catch-up clinic records were reviewed to determine immunization rates in each group.

The data were analyzed with the SPSS-PC program using chi-square analysis. The parents in the intervention group who were not reached by the interviewers were included in the intervention group for the analysis. This potentially decreases the observed difference between the two groups but avoids a more serious problem of biasing the control group with more people who are noncompliant. The time for the actual intervention — the reminder about the community catch-up clinic — was determined by subtracting the time taken to do the questionnaire from the total time for the telephone interview.

RESULTS

The overall uptake of the first dose of the vaccine was 94% of 8560 eligible grade 7 students, 90% receiving the vaccine in school and 4% at community catch-up clinics. Among the intervention and control schools, 3% and 5% respectively of the parents refused to have their child immunized (Table I). Of the 208 students

TABLE I
Response to First Dose of Hepatitis B Vaccine in
School-based Immunization Program, Ottawa-Carleton, 1994

	Total Number of Grade 7 Students	Intervention	Control
No. of students	8,560	3,597	2,590
Immunized at school (% of students)	7,684 (90%)	3,222 (90%)	2,233 (86%)
Refused (% of students)	120 (3%)	120 (3%)	121 (5%)
Previously immunized (% of students)	44 (1%)	44 (1%)	33 (1%)
Referred to physician (% of students)	3 (0.08%)	3 (0.08%)	7 (0.3%)
Referred to catch-up (% of students)	208 (6%)	208 (6%)	196 (8%)

TABLE II
Parents' Recollection About Receipt of Information on Hepatitis B
Immunization Program, Ottawa-Carleton, 1994

Source of Information	Received Number (%)	Did Not Receive Number (%)	Don't Know Number (%)
Health Department communication			
Information pamphlet	126 (70)	35 (19)	19 (11)
Community catch-up notice	68 (39)	68 (39)	39 (22)
Information in satisfactory language	120 (98)	3 (2)*	
Other communication			
Saw on TV	35 (22)	122 (75)	5 (3)
Heard on radio	22 (14)	135 (83)	5 (3)
Read in paper	32 (20)	126 (79)	4 (3)
Other information source	97 (60)	61 (38)	4 (3)
Child	18		
Doctor/nurse	8		
School	62		
Work	2		
Other	6		
TV or radio or paper	61 (38)		
TV or radio or paper or other	139 (86)		

* parent unable to read English or French

referred for the telephone intervention program, 198 parents/guardians were contacted (95%) and 193 completed or partially completed the questionnaire (93%). Many parents (70%) had received the information brochure given to the students to take home (Table II). At the time of the phone call (within one to three days of the school clinic), only 39% were sure they had received the letter with information about the catch-up clinic. This may be an underrepresentation of the actual receipt of the information, as children who were sick and absent at the time of the in-school clinic may not have returned to the school to receive the notice. A high proportion of the parents (86%) had received information about the immunization program from sources other than the direct communication from the Health Department through the school. Over one third (38%) had heard about the program through the media, and many schools sent home their

own information in addition to the parent information pamphlet.

The most common reason (51%) for non-participation in the school clinic was that the child was absent from school at the time of the clinic (Table III). There were several reasons relating to the delivery of the program that influenced the response rate, including lack of knowledge about the program (10%) and problems with the consent form (21%). Only a very small number of parents stated that their reason for not signing the consent form was concern about vaccine side-effects, lack of belief in immunizations, lack of concern about hepatitis B risk for their child or preference that all vaccines be given at a physician's office. When this group of parents was combined with those who wrote on the consent form that they refused to have their child immunized at the clinic, overall 4% of the parents refused immunization.

TABLE III
Reasons Student Did Not Receive Hepatitis B Vaccine at School,
Ottawa-Carleton, 1994

Reason	No. (% of responders)* n = 175	
Child-based Reasons	107	(61%)
Child sick or not at school	89	(51%)
Already had vaccine	7	(4%)
Unsure if child had vaccine	1	(1%)
Child terrified of needles	8	(5%)
Had hepatitis B disease	1	(1%)
Medical reason to go to physician for immunization	1	(1%)
Program-based Reasons	62	(35%)
Did not know about program	18	(10%)
Lost consent form	15	(9%)
Consent not signed	9	(5%)
Received consent too late	7	(4%)
Problem with how consent form was signed	5	(3%)
Requested information not received	3	(2%)
Confused about program	4	(2%)
Teacher lost consent form	1	(1%)
Parent-based Reasons	14	(8.0%)
Concerned re vaccine side-effects	4	(2%)
Don't believe in immunization	2	(1%)
Only get immunizations at doctor's	2	(1%)
Hepatitis B rate & risk is low	2	(1%)
Do not know	4	(2%)

* Respondents could give more than one reason. Excludes students whose parents had actively refused consent i.e., were ineligible for telephone survey.

TABLE IV
Responses by Survey Participants (n=145) to Knowledge Questions
on Hepatitis B, Ottawa-Carleton, 1994

True/False Statement	Number (%) Correct	Number (%) Wrong	Number (%) Don't Know
Viruses can cause disease	128 (88)	3 (2)	14 (10)
Hepatitis B can be easily cured by taking medicine	101 (70)	23 (16)	21 (15)
Sometimes hepatitis B can be silent with no symptoms	113 (78)	10 (7)	22 (15)
Sometimes people with hepatitis B infection develop severe liver disease and die	131 (90)	2 (1)	12 (8)
Hepatitis B is spread by coughing and sneezing	97 (67)	21 (15)	27 (19)
Hepatitis B vaccine can prevent infection with the hepatitis B virus	135 (93)	1 (1)	9 (6)
Hepatitis B is spread by contact with body fluids such as blood from an infected person	128 (88)	5 (3)	12 (8)
Hepatitis B vaccine has almost no side effects and is very safe	131 (90)	4 (3)	10 (7)
Overall Knowledge Score			
All 8 statements	60 (41)		
7 of 8 statements	37 (26)		
6 of 8 statements	24 (17)		
5 of 8 statements	7 (9)		
4 of 8 statements	10 (7)		
3 of 8 statements	2 (1)		
0 of 8 statements	5 (3)		

Of the 145 who answered the section of the questionnaire on knowledge about hepatitis B, 41% correctly identified all the true and false knowledge statements (Table IV). The two questions with the highest rates of wrong answers related to treatment (16%) and transmission (15%). Parents had much higher knowledge scores if they had received the information pamphlet sent home with the student ($p < 0.001$) (Table V).

Participation in the catch-up clinic was significantly better in students whose parents had received the telephone call as well as the letter compared with those who received only the follow-up letter (72% versus 50%; $p < 0.01$) (Table VI). In addition, among the parents who received both the letter and telephone call, there was a suggestion that those who had heard about the immunization program from the media or another source in addition to the information sent home with the child were more likely than those who had not to bring their child to the community catch-up clinic (Table VII).

The average time to tell parents about the catch-up clinic was nine minutes. Much of this time was taken in contacting people, as it took an average of two to three calls to reach people. About 10% asked to have the nurse call them to answer further questions about the program.

The additional benefit of the phone intervention over the letter reminder alone was calculated by comparing the rate of overall immunization in a population of 10,000 students with and without the intervention. If the initial response was 90%, as in the intervention group (see Table I), then there would have been 8,960 students immunized at school (90%), and 580 (6%) would have been referred for the catch-up clinics. With the letter alone, 287 (50%) would be immunized at the catch-up clinic. With the letter and phone call, 415 (71%) students would be immunized. Therefore, an additional 128 students ($415 - 287$) would receive immunization. The overall rate of immunization would be increased by 1% ($128/10,000$). The same calculations done with an initial response rate of 86%, as in the control group, result in an increase of 2% in the overall immunization rate.

TABLE V
Knowledge Score by Receipt of Parental Hepatitis B Information Pamphlet, Ottawa-Carleton, 1994

	Number of Correct Responses for Eight Questions			
	Eight Number (%)	Seven Number (%)	Six Number (%)	Five or fewer Number (%)
Received pamphlet (n=105)	51 (49)	27 (26)	16 (15)	11 (11)
Did not receive pamphlet (n=25)	4 (16)	5 (20)	5 (20)	11 (45)

TABLE VI
Hepatitis B Immunization at Community Catch-up Clinic by Follow-up Intervention, Ottawa-Carleton, 1994

	Phone and Letter	Letter Only
No. referred	208	196
No. reached by telephone	198	—
No. immunized	149	97
(% of referred)	(72%)*	(50%)*
(% of reached)	(75%)	—

* Chi-square analysis p<0.01

TABLE VII
Immunization at Catch-up Clinic of Students Whose Parents Received Phone Call, by Various Factors, Ottawa-Carleton, 1994

		Immunized at Catch-up Clinic		Total
		Yes Number (% total)	No Number (% total)	
Received pamphlet	- yes	97 (78)	28 (22)	125
	- no	24 (67)	11 (31)	35
Received follow-up notice	- yes	53 (78)	15 (22)	68
	- no	52 (78)	15 (22)	67
Media or other source of information re hepatitis B	- yes	106 (77)	32 (23)	138
	- no	11 (58) p = 0.10*	8 (42)	19
Knowledge score	- 8/8	45 (75)	15 (25)	60
	- 7/8	31 (84)	6 (16)	37
	- 6/8	16 (67)	8 (33)	24
	- 5 or less/8	16 (67)	8 (33)	24

* Chi-square analysis

In this study people without specific health backgrounds, who received training before the survey, made the phone calls. At \$15.00 per hour, the intervention in this study cost \$2.18 per person called. Using the hypothetical population of 10,000 students, the cost for the phone intervention would be \$1,264.40 in the first scenario with a 6% referral rate to the catch-up clinics, or \$972.00 for each one percent increase in rate. Using the second scenario with a referral rate of 8%, the intervention would cost \$1,656.80. This results in a cost of \$974.00 per one percent increase in

rate. This cost does not include the cost of obtaining the phone numbers at the schools and training and supervising the staff to do the intervention.

DISCUSSION

Overall, the grade 7 school-based hepatitis B vaccine program was very well received by both parents and students in the Ottawa-Carleton region after an in-school student education program and pamphlets for parental education. Concerns about vaccines in general or the

hepatitis B vaccine in particular, including the side-effects, were infrequent among the parents/guardian. Unfortunately, we do not have more information about why parents refused immunization or whether a call would have allowed them to discuss their concerns and perhaps change their mind.

The greatest potential benefit in improvements to the immunization rate will likely come from improving the delivery of information about the school clinic to parents and increasing parental receipt and return of the consent form. These were major reasons for initial non-participation in the school clinic. It is important that parents receive the information about the clinic in a timely manner. This is a challenge, given that the student must take the consent form home, and teachers must remember to give the form to students who were absent on the day of the classroom presentation. These and similar refinements to an already successful program will likely enhance participation at the school clinics.

Telephone contact with the parents/guardians following non-participation of the child at the school clinic increased the participation rate in the community catch-up clinics beyond that obtained with a follow-up letter alone. The overall increase in rates in this study was low, about 1%, because the initial response rate at the school clinic was so high. Health units will have to consider the overall costs for this addition to the program versus its yield before adopting this intervention.

CONCLUSION

The first dose of hepatitis B vaccine in the immunization program for grade 7 students in the school setting resulted in a high initial immunization rate (90%). An additional 4% of students participated in the community catch-up clinics. A reminder phone call increased participation at the community catch-up clinics, but the increase in the total rate of students immunized was small since the vast majority had been immunized at school. Health units will have to consider the overall gain from this added intervention in light of the costs. Improvements to the consent form and to the procedures for informing parents about

the school program and cost of clinics could improve the immunization participation at the school clinics and decrease the need for community catch-up clinics.

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Received: February 21, 1996

Accepted: February 2, 1997

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En février 1995, le Conseil d'administration de l'ACSP a jugé que les incidences des politiques et des conditions socio-économiques sur la santé devaient faire l'objet d'une priorité d'action au sein de l'Association. L'ACSP a mis sur pied un groupe de travail chargé de l'élaboration d'un document de travail.

Présidé par Sherri Torjman, le groupe était composé de Doug Angus, Claudette Boyd, Susan Carter, Rick Edwards, Joan Feather, Pat Kerans, Fernand Turcotte et Reg Warren. Ce groupe a réuni un ensemble de personnes qui, pour avoir travaillé pendant longtemps à l'élaboration des politiques économiques et sociales, possédaient une vaste expérience des conditions socio-économiques au Canada. L'ACSP leur est reconnaissante pour le temps et les connaissances qu'elles ont mobilisés pour élaborer ce document. L'ACSP tient également à remercier les réviseurs externes, les collaborateurs et son personnel pour l'aide apportée à la préparation de ce rapport.

Ce document de travail aborde différentes dimensions de l'environnement socio-économique, notamment la répartition des revenus, l'éducation, le chômage, la discrimination systémique et la violence. Le document recense les incidences sur la santé de ces différentes dimensions et en envisage les conséquences au plan des orientations politiques. Entre autres, il s'agit des changements à apporter aux différents programmes de revenu et à la fiscalité, à la législation sur le travail, aux programmes d'éducation et de formation, ainsi qu'aux soutiens et aux services sociaux.

L'ACSP a élaboré ce document de travail à l'intention des individus et des organismes du secteur de la santé entre autres, pour mieux leur faire connaître les incidences des conditions socio-économiques sur la santé, ainsi que pour jeter les bases d'un débat portant sur les conséquences de certaines politiques publiques

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