ABSTRACT

Objective: Low uptake of childhood immunizations is a problem in many First Nations communities. This article describes the results of a study that examined mothers' perceptions of childhood immunizations and the factors that influence uptake.

Method: Person-centred interviews focussing on childhood immunizations and child health were conducted with 28 mothers of young children in two First Nations communities in the Sioux Lookout Zone. Content analysis was applied to the interview data and patterns and themes were developed.

Results: Data analysis identified four key factors as negatively influencing immunization uptake: knowledge barriers, the influence of others, vaccine barriers, and missed opportunities.

Conclusions: Further research with Elders and community members along with culturally sensitive education initiatives are required to address low immunization uptake. Changes in health professionals' behaviours may serve to reduce missed opportunities.

ABRÉGÉ

Objectif: Le but de cette recherche était l'examen du problème du faible taux de vaccination des enfants dans les communautés des Premières Nations. Spécifiquement, l'étude requiert une étude qui permet d'identifier les perceptions des mères dans les communautés des Premières Nations à l'égard de la vaccination des enfants, et les facteurs qui en influencent la représentation.

Méthode : Vingt-huit mères de jeunes enfants dans deux communautés des Premières Nations de la région de Sioux Lookout ont participé à des entrevues personnalisées centrées sur la vaccination et la santé des enfants. On a procédé à une analyse de contenu sur les données recueillies lors des entrevues, puis des schémas et des thèmes ont été développés à partir de là.

Résultats : L'analyse des données a permis d'identifier quatre facteurs clés responsables du faible taux de participation aux vaccinations; la barrière du savoir, l'influence des autres, la barrière des vaccins, et les occasions manquées.

Conclusions : Des recherches plus poussées avec des aînés et des membres de la communauté, ainsi que sur des initiatives d'enseignement liées au milieu culturel sont nécessaires pour parler du faible taux de participation aux vaccinations. Des changements dans les comportements des professionnels de la santé peuvent servir à réduire les occasions manquées.

Mothers' Perceptions of Childhood Immunizations in First Nations Communities of the Sioux Lookout Zone

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Few other interventions surpass the positive impact immunizations have had on the health of Canadian children over the past century. Indigenous polio has been eradicated from the Americas, and the introduction of the *Haemophilus influenzae* type b (Hib) conjugate vaccine in 1988 has decreased the incidence of Hib disease by more than 90%.¹ As a result of the success of immunization programs in Canada few parents today have witnessed a child with diphtheria, tetanus, or polio. Within Canada, however, inequities exist and First Nations' children, especially those living on reserves, continue to experience a higher incidence of vaccine-preventable diseases. Infectious disease rates are up to 9 times higher in First Nations populations than in the general Canadian population,² infant mortality rates for First Nations children are almost twice the rate for Canadian infants (13.8 vs 7.3 per 1000)³ and outbreaks of vaccine-preventable diseases continue to afflict First Nations communities.

In the Sioux Lookout Zone, a geographic area that comprises 15,000 First Nations people in small isolated communities in Northwestern Ontario,⁴ low immunization coverage of young children increases the vulnerability of this population to communicable disease outbreaks. While current

accurate immunization statistics are not readily available, past data revealed that only 51% of children less than one year of age were age-appropriately vaccinated.⁵ In the Sioux Lookout zone, vaccinations are administered according to the *Routine Schedule for Canadian Infants and Children*¹ and immunization programs are delivered by community health nurses working in outpost nursing stations and health centres throughout the Zone. A computerized Health Information System (HIS) maintains immunization records on all residents and identifies individuals due for specific immunizations.⁶ Telephone reminders and transportation to immunization appointments are also provided in some communities to encourage attendance. Despite these measures, childhood immunization rates have been well below the acceptable targets of 95 to 97% set by the National Advisory Committee on Immunizations.⁷

To date, minimal research has explored childhood immunization uptake in First Nations communities. Research is required that will provide a better understanding of the perceptions held by First Nations parents regarding immunization and factors that influence uptake. Therefore, this research sought to answer the following question: What beliefs do First Nations parents have regarding childhood immunizations and childhood diseases and their impact on child health?

METHOD

Person-centred interviews⁸ were conducted with 28 mothers of young children in two communities in the Sioux Lookout Zone. A purposeful sample selection technique was used (e.g., birth records for the

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previous 5 years were used to identify potential subjects) and the local Community Health Representative assisted in contacting eligible subjects. Informed consent was obtained and the interviews were scheduled and conducted by the first author.

Semi-structured interviews focussing on childhood immunizations and child health were used to guide data collection (See Table I). Interviews were audio-taped and transcribed verbatim and standard content analysis was applied.⁸ Content analysis involves categorizing the content of the data and coding those categories in an attempt to discover patterns and themes.⁹ After all the codes were generated, major themes were extracted and are discussed in the following section. Immunization records of the participants' children were also collected and reviewed.

RESULTS

Table II gives a demographic profile of the participants. Their ages ranged from 18 to 41 years with most having an education level of Grade 9 or less (68%). Half of the participants (n=14) worked outside the home either full-time (n=10) or part-time (n=4). Most participants were married or in common-law relationships (n=24). The number of children of the participants ranged from 1 to 8. The majority of the participants (n=25) had at least one child who had not been age-appropriately vaccinated (i.e., immunizations given more than 60 days past when they were due).

Interview data revealed that immunization uptake was influenced by four key factors: knowledge barriers, the influence of others, vaccine barriers, and missed opportunities.

Knowledge barriers

Although participants were provided with vaccine information by nurses and most believed that immunizations were important, mothers readily admitted that they had limited knowledge of how immunizations worked or what diseases they covered. Mothers were also unaware of where vaccine-preventable diseases came from and how they were transmitted. As one participant stated:

I don't really know how they catch it or where it comes from. . . . If it's passed

on from one person to another, it just appears out of nowhere, I'm not sure.

When questioned about which diseases they thought immunizations prevented, participants cited well-known diseases such as meningitis, polio, whooping cough, and diphtheria, although most could only name one or two. Chicken pox and AIDS were also referred to as vaccine-preventable diseases. Most participants reported vaccine-preventable diseases as serious, but they were unsure of the specific effects the diseases could have on their children. When asked about the benefits of immunizations, "preventing disease" was overwhelmingly cited as the major benefit of immunization, and some mothers believed that if their children were immunized, they were no longer susceptible to these diseases. A few mothers were aware that their vaccinated children were still susceptible to childhood diseases, however, the fact that some children caught diseases such as meningitis and pertussis despite being immunized left them with doubts about the effectiveness of vaccines.

Influence of others

Participants identified "stories" of negative sequelae from immunizations that circulated around their communities as having a negative impact on vaccination uptake. Accounts of children experiencing seizures, respiratory distress, and even dying after being immunized contributed to a hesitancy among mothers to have their children immunized.

[I] remember what happened to that child, he had an immunization needle the day before he went into seizures and he died. . . . I heard people say that he had received a needle and that probably was the cause of it.

TABLE I
Sample Questions from Interview Guide

- What do you think makes a child healthy?
- When I say the word "immunization", what are some thoughts that come to your mind?
- Tell me about some of the good things that you think your child gets from immunizations.
- Tell me about some of the bad things about immunizations.
- Tell me about some of the diseases that you think immunizations prevent or can protect your child from.
- Tell me about what usually happens when you take your child to the clinic for an immunization.
- Can you tell me some stories that you have heard about immunizations from family and friends or other community members.

TABLE II
Demographic Profile of Participants

Age of Participants		
Range	18-41	
Mean	28.19	
Number of Children		
Range	1-8	
Median	3	
Highest Level of Education	%	(n)
≤ Grade 9	68	(19)
Grade 10-12	32	(8)
Some Post-secondary	4	(1)
Employment Status		
Full-time	36	(10)
Part-time	14	(4)
Not Employed	50	(14)
Marital Status		
Married	61	(17)
Common-Law	25	(7)
Not Married	14	(4)

Overwhelmingly, mothers said that the Elders in their community did not believe in immunizations and did not understand why children today had to have so many needles. According to the participants, Elders questioned why a mother would give a well child something that would only make him/her sick. Elders would have witnessed many of the vaccine-preventable diseases that are rare today. They likely would also have participated in mass vaccination campaigns implemented during the 1950s and 1960s. Mothers speculated that Elders had never made the connection between immunization and the subsequent reduction in communicable diseases. Participants suggested that these anti-immunization beliefs were part of a larger problem where past negative experiences caused the Elders to mistrust the health-care system and those involved with it.

They just don't trust I don't think. They just don't trust whatever is poked into them. . . . A long time ago we just accepted what was done to us. . . . They just come and stick a needle in somebody and that was it. You

were told you need this but you didn't know what it was.

In light of these community beliefs about immunizations, it was not surprising that mothers reported receiving considerable negative advice from their parents and grandparents about immunizing their children. They were often told that immunizations were not necessary and of little benefit to the children.

My mom told me not to bother with the immunizations one time. She told me not to rely on them. . . . Like she didn't think it was important and I sort of grew up thinking like that too.

Vaccine barriers

Participants reported that their children experienced vaccine side effects such as fever and irritability, and pain, swelling, and redness at the injection site. Although most mothers were prepared for these side effects, which did not prevent them from having their children immunized, they voiced concern that side effects of vaccines might negatively influence other parents. In the community, immunizations were generally perceived as something that caused sickness rather than prevented it.

Some people . . . they think their kids get sick when they get the needles. . . . Some mothers refuse to bring them in [be]cause they get sick after they get their needles.

Missed Opportunities

Frequently children were not vaccinated when mothers attended the clinic with their child for immunization. If children were sick at the time the immunization was due, mothers reported that health professionals would usually recommend that immunization be delayed until the child had recovered. Consequently, an extra visit to the clinic was required. Knowing that their child was unlikely to be immunized during an illness, mothers would wait until the children were well before bringing them for immunization.

Once the nurse told me . . . that they don't want to give out shots when the kid is sick. . . . I have to wait for another day, 'til they're better. . . . Sometimes they tell me to wait cause they have an ear infection or fever.

Because they had often been informed by nursing staff that vaccinations were not given to sick children, most mothers voiced concern about having their children immunized even during minor illnesses. Some mothers reported that their children experienced such frequent illnesses that they were rarely well long enough to be immunized, and as a result often fell behind on their immunizations.

DISCUSSION

Findings highlight issues that may have an impact on immunization rates in First Nations communities. As in other studies,¹⁰⁻¹³ mothers revealed limited knowledge of how vaccines worked. They also had misconceptions about the protection offered by vaccines. The word "prevention" was used frequently by mothers to describe the benefits of immunization and some believed that their children were completely protected from childhood diseases by immunizations. Hence, when disease occurred in vaccinated children, it diminished parents' trust and faith in immunizations. Parents need to be better informed about the impact of immunizations and the actual diseases they protect against. The *National Guidelines for Childhood Immunization Practices* stipulate that parents require education about these factors "in a culturally sensitive way, preferably in their own language."^{1, p.3} While increasing parents' knowledge of immunizations does not guarantee improved immunization rates, clarifying misconceptions that inhibit vaccine uptake is imperative.

Participants identified that Elders had misgivings about immunizations. Although this finding must be interpreted with caution as it was not obtained directly from the Elders, it does further our understanding of prevailing attitudes towards immunizations in these two First Nations communities. Historical literature identifies that Elders were exposed to outbreaks of communicable disease.¹⁴ They would also have witnessed the reduction of communicable diseases through mass immunization campaigns. However, immunizations and other treatments were often provided without adequate explanation and this may have contributed to the Elders' mistrust of the health-care sys-

tem and vaccination programs. Further research with Elders is required to validate these findings, to understand these beliefs, and to seek their advice with regard to providing approaches to immunization that are culturally congruent and acceptable.

Minor side effects such as fever and irritability after immunization can present a major barrier to vaccine uptake^{15,16} and contribute to a belief that immunizations cause illness. Fever, irritability, and local reactions after immunization were perceived by some parents as an "illness" rather than self-limiting consequences of vaccination. Other studies have reported similar findings¹¹ and have established that children of parents who believed that vaccinations induced illness were much more likely to be inadequately immunized than children of parents not expressing this belief.¹⁷ With the higher incidence of childhood illness in First Nations communities, if immunizations are perceived to cause illness rather than prevent it, the cause-effect misunderstanding can contribute to low immunization rates.

Numerous studies have identified missed opportunities as one of the most important causes of under-vaccination of children.¹⁸⁻²³ Missed opportunities occur when a child presents to a health facility and does not receive any or all of the vaccinations that are due. One cause of missed opportunities is parental or provider misconceptions about the true contraindications to vaccination.^{19,21-29} As was evident from this study, minor illnesses and fever are often erroneously thought to preclude vaccination. Canadian immunization guidelines clearly stipulate that mild illnesses, with or without fever, which include colds and upper respiratory tract infections, are not contraindications to vaccination.¹ In most instances where health professionals do not immunize because of illness, or where parents choose not to take children for immunization due to illness, children could be vaccinated safely. Researchers have documented that only 1 to 6% of children who present for immunizations possess legitimate contraindications to vaccination.^{21,30,31}

It was also evident from this study that health professionals' refusal to vaccinate children during illness has had a negative impact on parents' behaviours. Not only

did mothers avoid bringing their children for vaccination during illness, most stated that they refused to have their child immunized during an illness. It is important for parents and health professionals to understand the morbidity and mortality that can result from failure to vaccinate. Recent measles outbreaks in the United States have been largely attributed to missed opportunities to vaccinate eligible children.³² In Canada in 1994, 25% of cases of *Haemophilus influenzae* type b infection occurred in children who had missed an opportunity for vaccination.³³

Ideally, most health professionals and parents would prefer to immunize only well children. However, immunizations are just as effective in sick children as in healthy ones and there appears to be no increase in side effects in mildly ill children.³² Given the high incidence of childhood illnesses such as upper respiratory tract infections and otitis media in First Nations children, immunizing only when children are completely well is not the best practice. It is estimated that simply by eliminating missed opportunities, something that is largely under the direct control of providers, under-vaccination of children can be reduced by up to 25%.^{20,34}

CONCLUSION

Low immunization uptake in First Nations communities is a complex problem that requires multiple strategies to adequately address it. As this study was exploratory in nature and only sampled two First Nations communities, further research is required to verify and validate the findings. While neither a comprehensive nor a complete review of the problem, this study has conveyed some of the perspectives of First Nations parents which warrant consideration in future programmatic efforts and has highlighted the need to work with First Nations communities to develop effective and acceptable community-based strategies. To assist First Nations communities in their health planning, information gained from this research has been shared with the leaders in the two communities involved and with health planners in the Sioux Lookout Zone.

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REFERENCES

1. National Advisory Committee on Immunization. *Canadian Immunization Guide*, 5th ed. Ottawa: Health Canada, 1998.
2. MacMillan HL, MacMillan AB, Offord DR, Dingle JL. Aboriginal health. *Can Med Assoc J* 1996;155:1569-78.
3. Canadian Institute of Child Health. *The Health of Canada's Children: A CICH Profile*, 2nd Ed. Ottawa: Canadian Institute of Child Health, 1994.
4. Young TK. Sioux Lookout First Nations Health Authority Participatory Research Project: Final Report I - Health Needs Assessment (Report prepared for the Sioux Lookout First Nations Health Authority and Nishnawbe-Aski Nation). Winnipeg, MB: Northern Health Research Unit, Department of Community Health Sciences, The University of Manitoba, 1995.
5. Health Canada. Sioux Lookout Zone immunization statistics 1994 (Unpublished Data). Sioux Lookout, Ontario, 1995.
6. Johnson R. The development of a computerized health information system to facilitate program planning/evaluation and enhanced First Nations control of community health services. *Can J Public Health* 1997;88(3):207-9.
7. National Advisory Committee on Immunization. Canadian national report on immunization 1997. *Pediatrics and Child Health* 1998;3(2).
8. Levy R, Hollan D. Person-centered interviewing and observation. In: Russell Bernard H (Ed.), *Handbook of Methods in Cultural Anthropology*. Walnut Creek, CA: Altamira Press, 1998;333-64.
9. Fetterman DM. *Ethnography Step by Step*. Newbury Park, CA: Sage Publications, 1989.
10. Angelillo IF, Ricciardi G, Rossi P, et al. Mothers and vaccination: Knowledge, attitudes, and behaviour in Italy. *Bull World Health Organ* 1999;77(3):224-29.
11. Keane V, Stanton B, Horton L, et al. Perceptions of vaccine efficacy, illness, and health among inner-city parents. *Clin Pediatr* 1993;32(1):2-7.
12. McCormick LK, Bartholomew LK, Lewis MJ, et al. Parental perceptions of barriers to childhood immunizations: Results of focus groups conducted in an urban population. *Health Educ Res* 1997;12(3):355-62.
13. White GE, Thomson AN. 'As every good mother should'. Childhood immunization in New Zealand: A qualitative study. *Health and Soc Care* 1995;3:73-82.
14. Young TK. *Health Care and Cultural Change: The Indian Experience in the Central Subarctic*. Toronto: University of Toronto, 1988.
15. Lannon C, Brack V, Stuart J, et al. What mothers say about why poor children fall behind on immunizations. *Arch Pediatr Adolesc Med* 1995;149:1070-75.
16. Pruitt RH, Kline PM, Kovaz RB. Perceived barriers to childhood immunization among rural populations. *J Community Health Nurs* 1995;12(2):65-72.
17. Salsberry PJ, Nickel JT, Mitch R. Inadequate immunization among 2-year-old children: A profile of children at risk. *J Pediatr Nurs* 1994;9(3):158-65.
18. Bradford BJ, Benedum KJ, Heald PA, Petrie SE. Immunization status of children on school entry: Area analysis and recommendations 1991. *Clin Pediatr* 1996;35(5):237-42.
19. Gindler JS, Cutts FT, Barnett-Antinori ME, et al. Successes and failures in vaccine delivery: Evaluation of the immunization delivery system in Puerto Rico. *Pediatrics* 1993;91(2):315-20.
20. Holt E, Guyer B, Hughart N, et al. The contribution of missed opportunities to childhood underimmunization in Baltimore. *Pediatrics* 1996;97(4):474-80.
21. McConnochie KM, Roghmann KJ. Immunization opportunities missed among urban poor children. *Pediatrics* 1992;89(6):1019-26.
22. Sabnis SS, Pomeranz AJ, Lye PS, Amateau MM. Do missed opportunities stay missed? A 6-month follow-up of missed vaccine opportunities in inner city Milwaukee children. *Pediatrics* 1998;101(e5):1-4.
23. Szilagyi PG, Rodewald LE, Humiston SG, et al. Missed opportunities for childhood vaccinations in office practices and the effect on vaccination status. *Pediatrics* 1993;91(1):1-7.
24. Campbell JR, Szilagyi PG, Rodewald LE, et al. Intent to immunize among pediatric family medicine residents. *Arch Pediatr Adolesc Med* 1994;148:926-29.
25. England L, Stauton R, Schubert C. Immunizing preschool children: Beliefs and practices of pediatric residents. *Clin Pediatr* 1997;36(3):129-34.
26. Hughart N, Guyer B, Stanton B, et al. Do provider practices conform to the new pediatric immunization standards. *Arch Pediatr Adolesc Med* 1994;148:930-35.
27. Salsberry PJ, Nickel JT, Mitch R. Missed opportunities to immunize preschoolers. *Appl Nurs Res* 1995;9(3):158-65.
28. Wood D, Halfon N, Pereyra M, et al. Knowledge of childhood immunizations schedule and of contraindication to vaccinate by private and public providers in Los Angeles. *Pediatr Infect Dis J* 1996;15:140-45.
29. Zimmerman RK, Schlesselman JJ, Baird AL, Mieczkowski TA. A national survey to understand why physicians defer childhood immunizations. *Arch Pediatr Adolesc Med* 1997;151:657-64.
30. Burgess MA, Levy M, Alperstein G, et al. 'On the spot' vaccination: Does it work? *J Pediatr Child Health* 1996;32:63-67.
31. Peckham C, Bedford H, Senturia Y, Ades A. The Peckham Report. National Immunisation Study: Factors Influencing Immunisation Uptake in Childhood. London, England: Department of Paediatric Epidemiology, 1989.
32. National Immunization Program. *Epidemiology and Prevention of Vaccine-preventable Diseases*, 5th Ed. Atlanta: CDC, 1999.
33. National Advisory Committee on Immunization. An advisory committee statement: Guidelines for childhood immunization practice. *Can Commun Dis Rep* 1997;23:1-5.
34. Harper PG, Madlon-Kay J, Luxenberg MG, Tempest R. A clinic system to improve preschool vaccinations in a low socioeconomic status population. *Arch Pediatr Adolesc Med* 1997;151:1220-23.

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