

Portrait of Outpatient Visits and Hospitalizations for Acute Infections in Nunavik Preschool Children

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ABSTRACT

Objective: Inuit children from around the world are burdened by a high rate of infectious diseases. The objective of this study was to evaluate the incidence rate of infections in Inuit preschool children from Nunavik (Northern Québec).

Methods: The medical chart of 354 children from a previously recruited cohort was reviewed for the first five years of life. All outpatient visits that led to a diagnosis of acute infection and all admissions for acute infections were recorded.

Results: Rates of outpatient visits for acute otitis media (AOM) were 2314, 2300, and 732 events/1000 child-years for children 0-11 months, 12-23 months, and 2-4 years, respectively. Rates of outpatient visits for lower respiratory tract infections (LRTI) were 1385, 930, and 328 events/1000 child-years, respectively. Rates of hospitalization for pneumonia were 198, 119, and 31 events/1000 child-years, respectively.

Conclusion: Inuit children from Nunavik have high rates of AOM and LRTI. Such rates were higher than that of other non-native North-American populations previously published. Admission for LRTI is up to 10 times more frequent in Nunavik compared to other Canadian populations.

MeSH terms: Inuit; infant; child; infection; respiratory tract infection; epidemiology; hospitalization

La traduction du résumé se trouve à la fin de l'article.

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Acute infectious diseases incidence has consistently been reported to be high in children of Inuit communities throughout the world.¹⁻⁶ In Northern Canada, Alaska and Greenland, Inuit children have the highest prevalence of otitis media ever reported.⁷ In Alaska, native children have higher rates of pneumococcal infections,^{1,8} respiratory syncytial virus infections,^{1,9,10} and hospitalization for respiratory infections,² compared to Caucasian children. High hospitalization rates for lower respiratory tract infections (LRTIs) in Inuit children have also been observed in the Baffin region in Canada^{5,11} and Greenland.³

The Nunavik region is located in the northernmost part of the province of Quebec (Figure 1). Children from Nunavik, like other Inuit populations, are burdened by a high incidence of acute infections. During the last 10 years, we have assessed infection incidence and prevalence in children from Nunavik in order to evaluate their association with prenatal exposure to contaminants. By doing this, we have gathered an important body of data that underlines a considerably high incidence of acute infections for these children.^{12,13} Because little is known on acute infection incidence rates in Nunavik, and because we think that the observed incidence rates were high enough to deserve health workers' attention, we constituted a third cohort of 354 preschool children for whom we reviewed the medical chart for a period encompassing their first five years of life. These children were born to mothers who had previously participated in a study monitoring umbilical cord blood contaminant concentrations between 1994 and 1996.¹⁴ The information collected has allowed us to draw a complete portrait of outpatient visits and hospitalizations for acute infections in these children. In this study, we report the incidence rates of outpatient visits and hospitalizations for the most common infections in preschool children of Nunavik.

MATERIALS AND METHODS

Study population

Between 1994 and 1996, 491 unselected pregnant women from the 14 Inuit communities of Nunavik were enrolled in a study on prenatal exposure to food-chain

contaminants.¹⁴ These represent 75% of women giving birth in Nunavik during the study period. Briefly, pregnant women were invited to participate at their arrival at one of the two health centres in Nunavik for delivery (Puvirnituq and Kuujjuaq, see Figure 1). Women giving birth elsewhere were not included. An interview was conducted with the mothers a few months after delivery. Children born to these mothers were the targeted participants for the current study.

Four hundred ninety-one mothers originally participated in the study on contaminants in umbilical cord blood. There was not enough information for us to trace the charts for 37 (7.5%) children and it was impossible to get 45 (9.1%) charts for various logistical reasons. Of the 410 charts available, 28 (6.8%) were incomplete, 17 (4.1%) families moved out of Nunavik during follow-up, 8 (2.0%) children died and 3 (0.7%) children were excluded because they suffered from a serious chronic disease. The final analyses included the 354 remaining children. Table I shows the characteristics of these children and their mothers. Mothers participating in the study had comparable age distribution and mean parity with the general population of parurient women from Nunavik.¹⁵ However, preterm births were under-represented because at-risk pregnancies and deliveries were usually directed to urban hospitals and thus excluded from the study.

Medical chart review

We attempted to review the medical charts of all the children included in the above-mentioned study. For every diagnosis of infection noted in the charts, we recorded the date of diagnosis and whether the child was hospitalized. For each infection, we also attributed a code corresponding to the International Classification of Primary Care, 2nd edition (ICPC-2) of the World Organization of National Colleges, Academies and Academic Associations of General Practitioners.¹⁶ Categories were formed for infections affecting the same anatomic site (detailed in Table II).

For every health problem identified, we always trusted the diagnosis of the attending physician. When two physicians disagreed, we only recorded the last diagnosis made. Only new illnesses were recorded. We excluded follow-up visits and consulta-

TABLE I
Characteristics of Participants

Characteristics	Mean Value (STD) or Percentage (n = 354)
Children	
Sex (male)	48.6%
Given to adoption	23.8%
Hospital of delivery	
Puvirnituq	50.0%
Kuujjuaq	50.0%
Gestational age	
Mean gestational age	39.1 (1.6) weeks
Premature (<37 weeks)	5.1%
Birthweight (g)	3486 (466) g
Length (cm)	51.4 (2.5) cm
Exposed to second-hand smoke*	92.4%
Mothers	
Age	23.8 (5.5) years
Parity	2.1 (1.8)
Smoking during pregnancy	84.0%

* At least one smoker living with the child and smoking inside the house



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Figure 1. Location of Inuit communities in Nunavik (Province of Québec, Canada)

tions for unresolved infections previously recorded. We did not gather information on infectious episodes for which parents decided not to seek medical attention.

Statistical analyses

For each type of infection, we computed the incidence of new episodes for each participant. Each infectious episode was considered independent from all other episodes, including the ones of the same

nature. However, we excluded episodes that were diagnosed within 15 days of a previous episode affecting the same anatomic site. We computed mean incidence rates using the expression [(total number of episodes ÷ total duration of follow-up) × 1000]. We used SPSS Data Entry Builder 2.0 for data entry (Chicago, Illinois, United States) and SAS 8.02 (Cary, NC, United States) for database management and statistical analyses.

TABLE II
Description of Infection Classification and ICPC-2 Codes

Category	Codes ICPC-2	Infections Included
Upper respiratory tract infections (URTI)	R72	Streptococcal pharyngitis and tonsillitis
	R74	Acute upper respiratory tract infection, acute rhinitis, head cold, nasopharyngitis, pharyngitis, and coryza
	R75	Sinusitis
	R76	Tonsillitis
	R77	Laryngitis, tracheitis, and croup
Lower respiratory tract infections (LRTI)	R80	Influenza
	R78	Acute bronchitis or bronchiolitis, acute lower respiratory infection NOS, chest infection NOS, laryngotracheobronchitis, and tracheobronchitis
	R81	Bacterial and viral pneumonia, bronchopneumonia, influenza pneumonia, Legionnaire's disease, and pneumonitis
Gastro-intestinal infections (GII)	D70	Gastrointestinal infection or dysentery with specified organism
	D73	Diarrhea or vomiting presumed to be infective, dysentery NOS, and gastric flu
Cutaneous infections	S71	Herpes simplex
	S72	Scabies and other acariases
	S84	Impetigo
	S76	Other skin infections NOS
Other systemic viral diseases	A76	Viral exanthem
	A77	Other viral disease NOS

NOS = Not otherwise specified; ICPC-2 = International classification of primary care, 2nd edition

RESULTS

Infection incidence rate

We identified 8031 outpatient visits that led to a diagnosis of a newly developing acute infection before the age of 5 years, and 246 episodes were excluded because they were diagnosed within 15 days of a previous episode affecting the same anatomic site. Table III shows the incidence of the 17 most frequent infections. In children less than 12 months old, AOM had the highest incidence (2314 episodes per 1000 child-years), followed by URTI (2126 per 1000) and LRTI (1385 per 1000). The other most frequent infections, in order of decreasing incidence rate, were gastro-intestinal infections, cutaneous

infections, conjunctivitis, chickenpox, other systemic viral diseases, otitis externa, and urinary tract infections (UTI).

In children aged 12-23 months, the incidence rates were lower than in children <12 months old, except for cutaneous infections, systemic viral diseases, otitis externa, and UTI. The most frequent infections were again AOM (2300 episodes per 1000 child-years), URTI (1573 per 1000), and LRTI (930 per 1000).

As expected, in children aged 2-4 years, the incidence rates were much lower than in younger children. Upper respiratory tract infections were the most frequent (931 episodes per 1000 child-years), followed by AOM (732 per 1000), LRTI (328 per 1000), and cutaneous infections (229 per 1000).

Figure 2 shows the incidence rates of AOM, URTI, LRTI, cutaneous infections, gastro-intestinal infections, and conjunctivitis, according to the age of the children. All 6 infections peaked before 1 year of age. Acute otitis media had the highest incidence between 6 and 11 months while URTI plateaued during the first 9 months and decreased afterwards. Lower respiratory tract infections peaked before 6 months and also decreased steadily afterwards.

Cumulative incidence

In Tables IV and V, we show the cumulative incidence (percentage of children with at least 1 episode (Table IV) or at least 3 episodes (Table V)) according to age. More than 90% of the children in our study had at least one episode of AOM and URTI by the age of 24 months. As much as 38% of them were diagnosed with at least one episode of LRTI before 6 months of age, and 83% before 5 years of age. Half of them had at least one GI infection and one cutaneous infection before 2 years of age. Three children out of 4 were diagnosed three times or more with AOM before 5 years. For LRTI, 17% of the children had at least 3 episodes before 1 year of age, and 49% before 5 years of age.

Hospitalizations

We identified 302 hospitalizations related to infectious diseases during the complete follow-up. Table VI presents the incidence rate of the most frequent hospitalization for infectious diseases. Hospitalizations for infections were far more frequent before 1 year of age. In children aged <1 year old,

TABLE III
Incidence Rate of Acute Infections

Infection	Incidence Rate (95% CI) Events per 1,000 child-years		
	0 to 11 Months Old	12 to 23 Months Old	2 to 4 Years Old
Acute otitis media	2314 (2074 - 2554)	2300 (2044 - 2557)	732 (643 - 822)
Upper respiratory tract infections	2126 (1915 - 2336)	1573 (1402 - 1744)	931 (817 - 1044)
Lower respiratory tract infections	1385 (1198 - 1573)	930 (795 - 1065)	328 (280 - 377)
Gastro-intestinal infections	405 (333 - 477)	326 (258 - 395)	179 (150 - 210)
Cutaneous infections	309 (239 - 379)	514 (425 - 602)	229 (193 - 265)
Conjunctivitis	211 (151 - 271)	116 (81 - 152)	90 (70 - 110)
Chicken pox	134 (80 - 148)	102 (70 - 135)	80 (65 - 95)
Other systemic viral diseases	68 (40 - 96)	77 (44 - 109)	40 (27 - 53)
Otitis externa	40 (17 - 62)	108 (66 - 150)	28 (18 - 39)
Urinary tract infections (female)	39 (5 - 73)	78 (28 - 128)	65 (40 - 90)
Urinary tract infections (male)	35 (7 - 64)	41 (6 - 77)	18 (5 - 30)
Balanitis	12 (-5 - 28)	18 (-2 - 38)	14 (2 - 25)
Meningitis	11 (0 - 23)	6 (-2 - 14)	1 (-1 - 3)
Blepharitis / stye / chalazion	11 (0 - 23)	3 (-3 - 9)	5 (1 - 9)
Post traumatic skin infections	9 (-1 - 18)	6 (-2 - 14)	6 (1 - 10)
Pyelonephritis / pyelitis (female)	11 (-5 - 27)	6 (-6 - 17)	7 (-2 - 16)
Pyelonephritis / pyelitis (male)	0 (-)	0 (-)	0 (-)
Worms and parasites	0 (-)	3 (-3 - 9)	7 (0 - 13)
Vaginitis and vulvitis	0 (-)	0 (-)	17 (5 - 29)

pneumonia was the most frequent (198 hospitalizations per 1000 child-years), followed by bronchitis/bronchiolitis (107 per 1000), URTI (28 per 1000), and UTI (17 per 1000 for females and 18 per 1000 for males).

In older children, pneumonia was responsible for most hospitalizations with an incidence rate of 119 hospitalizations per 1000 child-years for children between 12 to 23 months old, and 31 for children 2 to 4 years old. Hospitalization for UTI in females was the second most frequent diagnosis at discharge for children 12 to 23 months old.

DISCUSSION

The aim of this study was to evaluate the incidence rates of outpatient visits and hospitalizations for acute infections in preschool Nunavik children. To our knowledge, this is the first study documenting the incidence of acute infections in this population, both on an outpatient and an inpatient basis.

Our literature review has allowed us to identify relatively few recent published studies addressing the question of outpatient visits for acute infection in children. Table VII summarizes and compares the incidence rates previously published with that observed in the present study. Our results showed that AOM was the most frequently diagnosed health problem. Most studies addressing the question of ear infections in Inuit populations have focussed on chronic otitis media, scarring and hearing deficit.^{7,17-19} From these studies, it is well recognized that Inuit children are burdened by ear infections, but few recent articles have been published on the incidence of AOM. Our results show that the incidence of outpatient visits for AOM in Inuit children from Nunavik was higher than that of Aboriginal children from a remote community of Northern Ontario.²⁰ It was also higher than that of US children, but similar to what was observed in Alaska and Saskatchewan.^{21,22} It thus seems that the burden of ear infections in Nunavik is comparable to other Aboriginal children from North America. However, because ear infection is such a well-recognized problem in Nunavik, we found it surprising that non-native children from Saskatchewan had rates similar to native

TABLE IV

Cumulative Incidence of Acute Infection According to Age (≥ 1 Episode)

Infection	Cumulative Incidence (Percentage of Children with ≥ 1 Episode)			
	Before 6 months	Before 12 months	Before 24 months	Before 5 years
Acute otitis media	44%	80%	92%	95%
Upper respiratory tract infections	64%	81%	92%	97%
Lower respiratory tract infections	38%	64%	76%	83%
Gastro-intestinal infections	9%	32%	49%	66%
Cutaneous infections	7%	23%	50%	72%
Conjunctivitis	11%	17%	25%	40%
Chicken pox	5%	11%	21%	45%
Other systemic viral diseases	3%	6%	13%	21%
Otitis externa	1%	4%	11%	16%
Urinary tract infections (female)	2%	3%	9%	22%
Urinary tract infections (male)	3%	4%	7%	11%
Meningitis	1%	1%	2%	2%
Blepharitis / sty / chalazion	0%	1%	1%	3%
Balanitis	0%	1%	2%	6%
Post traumatic skin infections	1%	1%	1%	3%
Pyelonephritis / pyelitis (female)	1%	1%	2%	3%
Pyelonephritis / pyelitis (male)	0%	0%	0%	0%
Worms and parasites	0%	0%	0%	2%
Vaginitis and vulvitis	0%	0%	0%	4%

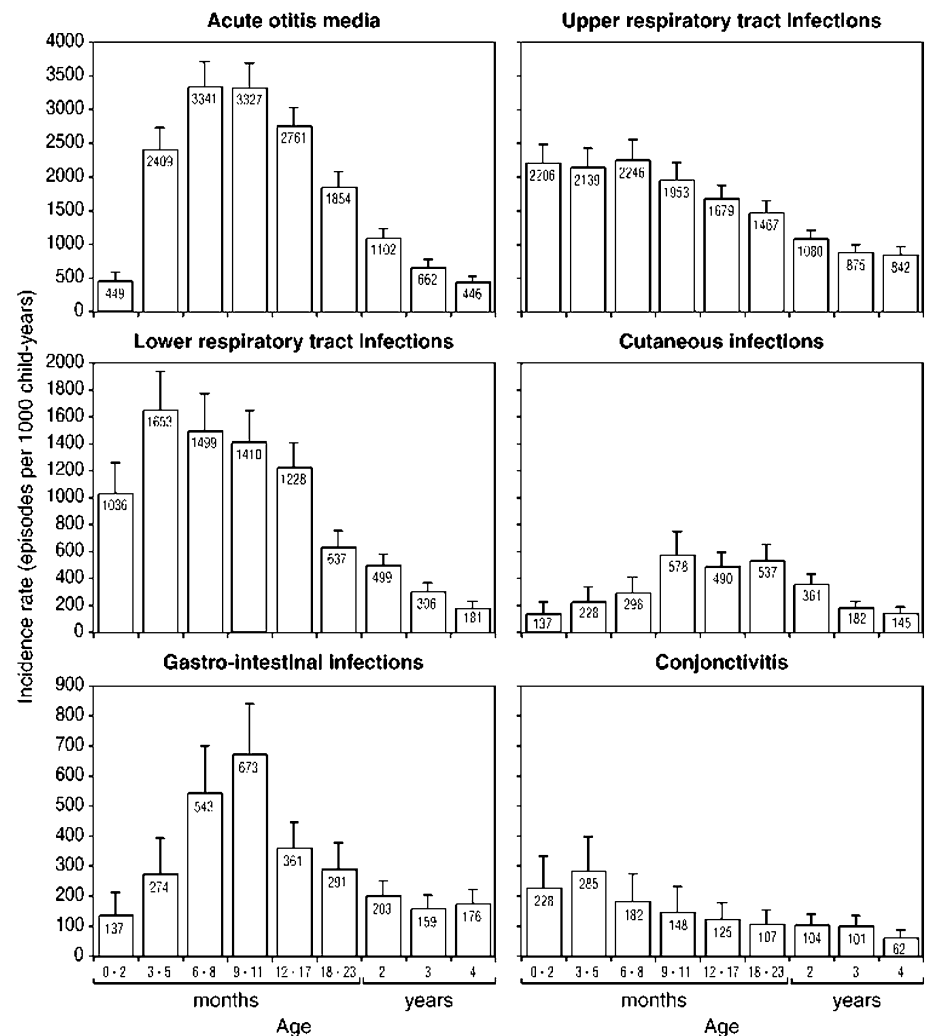


Figure 2. Incidence rates of outpatient visits for the most frequent acute infections in Inuit preschool children according to age

and Inuit children. It is, however, impossible to affirm that this was due to similar incidence rates and not to a bias intro-

duced by differences in parents' attitudes and perceptions towards medical visits for ear symptoms.

TABLE V
Cumulative Incidence of Acute Infection According to Age (≥ 3 Episodes)

Infection	Cumulative Incidence (Percentage of Children with ≥ 3 Episodes)			
	Before 6 months	Before 12 months	Before 24 months	Before 5 years
Acute otitis media	5%	37%	61%	76%
Upper respiratory tract infections	8%	32%	60%	79%
Lower respiratory tract infections	6%	17%	36%	49%
Gastro-intestinal infections	0%	1%	5%	16%
Cutaneous infections	0%	2%	8%	18%
Conjunctivitis	0%	1%	1%	3%
Other systemic viral diseases	0%	0%	0%	1%
Otitis externa	0%	0%	1%	1%
Urinary tract infections (female)	0%	0%	0%	1%
Pyelonephritis / pyelitis (female)	0%	0%	0%	1%

TABLE VI
Incidence Rate of Hospitalizations for Acute Infections

Principal Diagnosis on Discharge	Incidence Rate (95% CI) Events per 1000 child-years		
	0 to 11 months old	12 to 23 months old	2 to 4 years old
Pneumonia	198 (145 – 251)	119 (77 – 160)	30 (17 – 44)
Bronchitis / bronchiolitis	107 (68 – 147)	23 (5 – 40)	5 (0 – 10)
Upper respiratory tract infections*	28 (8 – 49)	0 (-)	1 (-1 – 3)
Urinary tract infections (female)	17 (-2 – 36)	33 (7 – 60)	2 (-2 – 6)
Urinary tract infections (male)	18 (-2 – 38)	12 (-11 – 35)	2 (-2 – 6)
Fever NOS	14 (2 – 27)	3 (-3 – 8)	1 (-1 – 3)
Acute otitis media	11 (0 – 22)	3 (-3 – 8)	1 (-1 – 3)
Pyelonephritis / pyelitis (female)	11 (-6 – 27)	6 (-5 – 17)	6 (-1 – 12)
Cellulitis	9 (-1 – 18)	14 (-1 – 29)	8 (1 – 14)
Meningitis	9 (-1 – 18)	6 (-2 – 14)	1 (-1 – 3)
Laryngitis / tracheitis	3 (-3 – 8)	9 (-1 – 18)	3 (0 – 6)

* For hospitalization, the upper respiratory tract infections category did not include streptococcal throats, sinusitis, tonsillitis, laryngitis, tracheitis, croup, and influenza (ICPC-2 codes R72, R75-77, and R80). These infections were analyzed separately.

We found that upper and lower respiratory tract infections were responsible for almost 30% of all outpatient visits for acute infections. Our results show that URTI were diagnosed as often as in other native populations, but less frequently than in children from Saskatchewan.^{3,20,22,23} However, LRTI were far more frequent in Nunavik children, with the exception of

Inuit from Greenland, who had the highest rates reported.^{3,20,22,23} There may be a great variability among parents, physicians and investigators on the perception and interpretation of respiratory symptoms, especially for the upper respiratory tract. It is therefore hazardous to infer from outpatient visits that differences between rates are solely due to difference in the incidence

of development of URTI. On the other hand, LRTI usually cause more serious symptoms. It is likely that the proportion of children with an undiagnosed acute infection of the lower respiratory tract will be smaller and that the rate of outpatient visits will better reflect the actual rate of LRTI. According to our results, LRTI infections in Nunavik are more frequent than in most other populations. So far, public health initiatives in Nunavik have focussed on ear problems. We believe that no effort should be spared to address the problem of LRTI as well.

In the present study, the rate of hospitalization was extremely high, as 56.8% of the children were hospitalized at least once, and more than 16% were hospitalized three times or more before they reached the age of five years. Table VIII shows the comparison between the rates observed and those recently published in the scientific literature. The hospitalization rate observed in the present study was lower than that previously found in the same population.¹⁵ It was, however, much higher compared to other native and non-native populations.^{2,22,24-26} In children aged <1 year, the rate of hospitalization for LRTI alone is higher in Nunavik than the rate of hospitalization for all causes in Manitoba and Southern Quebec.^{24,25} It is also twice that of low-income neighbourhoods in Manitoba, and up to 20 times that of the wealthiest area of Winnipeg.²⁶ These observations show that the high incidence of LRTI translates into an elevat-

TABLE VII
Comparison Between Incidence Rates Observed in This Study and in Other Recent Studies for Outpatient Visit Rates

Infection	Population	Age Group	Rates of Outpatient Visits event / child-year			Reference
			Cited Study	Present Study [95% CI]	Rate Ratio* (present / cited)	
AOM	Isolated Aboriginal community, Ontario, Canada	<1 y	1620	2113 [1921 – 2305]	1.3	Harris et al. (1998) ²⁰
AOM	Isolated Aboriginal community, Ontario, Canada	1-4 y	640	1059 [962 – 1155]	1.7	Harris et al. (1998) ²⁰
AOM	Saskatchewan, Canada	0-4 y	1200	1267 [1167 – 1368]	1.1	Wang et al. (1999) ²²
Otitis-related problems	Native children, USA	<1 y	3180	2424 [2213 – 2635]	0.8	Curns et al. (2002) ²¹
Otitis-related problems	Native children, USA	1-4 y	1070	1325 [1215 – 1434]	1.2	Curns et al. (2002) ²¹
Otitis-related problems	Natives from Alaska, USA	0-4 y	1580	1539 [1426 – 1653]	1.0	Curns et al. (2002) ²¹
Otitis-related problems	General population, USA	0-4 y	740	1539 [1426 – 1653]	2.1	Curns et al. (2002) ²¹
URTI	Isolated Aboriginal community, Ontario, Canada	<1 y	2170	1955 [1783 – 2126]	0.9	Harris et al. (1998) ²⁰
URTI	Isolated Aboriginal community, Ontario, Canada	1-4 y	780	1042 [947 – 1136]	1.3	Harris et al. (1998) ²⁰
URTI	Saskatchewan, Canada	0-4 y	1860	1223 [1131 – 1316]	0.7	Wang et al. (1999) ²²
URTI	Inuit, Greenland	<2 y	1860	1850 [1750 – 1950]	1.0	Koch et al. (2002 and 2003) ^{3,23}
LRTI	Isolated Aboriginal community, Ontario, Canada	<1 y	200	1310 [1153 – 1468]	6.6	Harris et al. (1998) ²⁰
LRTI	Isolated Aboriginal community, Ontario, Canada	1-4 y	65	467 [414 – 520]	7.2	Harris et al. (1998) ²⁰
LRTI	Saskatchewan, Canada	0-4 y	330	636 [574 – 697]	1.9	Wang et al. (1999) ²²
LRTI	Inuit, Greenland	<2 y	1780	1158 [1079 – 1237]	0.7	Koch et al. (2002 and 2003) ^{3,23}

AOM = acute otitis media; URTI = upper respiratory tract infections; LRTI = lower respiratory tract infections; CI = confidence interval.

* Rate ratios are presented to help compare studies but the reader must be aware that the designs can differ significantly.

TABLE VIII

Comparison Between Incidence Rates Observed in This Study and in Other Recent Studies for Hospitalizations

Hospitalization	Population	Age Group	Rates of Hospitalization event / child-year			Reference
			Cited Study	Present Study [95% CI]	Rate Ratio* (present / cited)	
AOM	Isolated Aboriginal community, Ontario, Canada	<1 y	1620	2113 [1921 – 2305]	1.3	Harris et al. (1998) ²⁰
All causes	Inuit, Nunavik (Québec, Canada) 1991-1996	<1 y	680	571 [492 – 650]	0.8	Pageau et al. (2003) ¹⁵
All causes	Inuit, Nunavik (Québec, Canada) 1996-2001	<1 y	880	571 [492 – 650]	0.7	Pageau et al. (2003) ¹⁵
All causes	Southern Québec, Canada, 1991-1996	<1 y	230	571 [492 – 650]	2.5	Pelletier (1999) ²⁴
All causes	Southern Québec, Canada, 1996-2001	<1 y	260	571 [492 – 650]	2.2	Pelletier (1999) ²⁴
All causes	Manitoba, Canada	<1 y	220	571 [492 – 650]	2.6	Brownell et al. (2002) ²⁵
All causes	Manitoba, Canada	1-4 y	52	177 [157 – 197]	3.4	Brownell et al. (2002) ²⁵
All infectious diseases	Native, USA, 1994	<1 y	156	401 [335 – 467]	2.6	Holman et al. (2001) ²
All infectious diseases	Native, USA, 1994	1-4 y	20	90 [74 – 106]	4.6	Holman et al. (2001) ²
LRTI	Inuit, Nunavik (Québec, Canada) 1991-1996	<1 y	332	305 [247 – 363]	0.9	Pageau et al. (2003) ¹⁵
LRTI	Inuit, Nunavik (Québec, Canada) 1996-2001	<1 y	406	305 [247 – 363]	0.8	Pageau et al. (2003) ¹⁵
LRTI	Low-income neighbourhood, Manitoba, Canada	<1 y	150	305 [247 – 363]	2.0	Kozyrskiy et al. (2002) ²⁶
Pneumonia	Saskatchewan, Canada	0-4 y	7	69 [57 – 81]	9.9	Wang et al. (1999) ²²

LRTI = lower respiratory tract infections; CI = confidence interval.

* Rate ratios are presented to help compare studies but the reader must be aware that the designs can differ significantly.

ed number of hospitalizations. This could be attributable to a lower threshold for hospitalization or to increased severity in LRTI in this population (presumably both).

In this study, we used a review of the medical charts to evaluate disease frequency. There is only one health centre in each community included in this study. Participants almost always go to that health centre when they seek medical attention, and copies of consultations done elsewhere are routinely requested to complete medical charts. We are therefore confident that we have reviewed a majority of outpatient visits sought by the participants. However, we did not attempt to verify every diagnosis, nor did we try to inquire about infections for which medical attention was not sought by the parents. It is therefore important to keep in mind that the incidence rates reported here are underestimated, especially for benign infection. Furthermore, our recruitment strategy did not allow inclusion of children born outside of Nunavik. Because women with at-risk pregnancies often give birth in a tertiary centre in Montreal or Quebec City, and because these women were excluded from our analysis, it can be expected that a bias towards healthier pregnancies is present in our results.

In this study, we drew a complete portrait of the incidence of infections leading to outpatient visits, and to admission in children of Nunavik. We believe that this information is important for public health purposes, especially to identify acute pathologies that represent an important

burden for the children, the parents, the communities, and the health care system. It is beyond the scope of this paper to find explanations for the elevated rates observed. Compared to the general population of Canada, some important risk factors for infection, such as tobacco exposure, crowding, and poor maternal education, are more prevalent in Nunavik.¹⁵ Preterm births, complicated deliveries and vaccination coverage do not seem, however, to be problematical in Nunavik.¹⁵ Further studies are needed to better grasp this likely multi-factorial situation in order to plan well-needed public health interventions.

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RÉSUMÉ

Objectif : Les enfants inuits de la plupart des pays nordiques ont un taux élevé de maladies infectieuses. L'objectif de cette étude était d'évaluer le taux de fréquence des infections aiguës chez les enfants inuits du Nunavik d'âge préscolaire.

Méthode : Les dossiers médicaux de 354 enfants ont été revus pour une période couvrant les cinq premières années de vie. Toutes les consultations médicales conduisant à un diagnostic d'infection aiguë et toutes les hospitalisations pour infection aiguë ont été notées.

Résultats : Les taux d'otite moyenne aiguë étaient de 2 314, 2 300 et 732 pour 1 000 enfants-années pour les enfants âgés de 0 à 11 mois, de 12 à 23 mois et de 2 à 4 ans, respectivement. Les taux d'infection des voies respiratoires inférieures étaient de 1 385, 930 et 328 pour 1 000 enfants-années, respectivement. Les taux d'hospitalisation pour pneumonie étaient de 198, 119 et 31 pour 1 000 enfants-années, respectivement.

Conclusion : Les résultats montrent que les enfants inuits du Nunavik avaient des taux élevés d'otite moyenne et d'infection des voies respiratoires inférieures. Ces taux étaient supérieurs à ceux d'autres populations nord-américaines publiés par d'autres auteurs. Comparativement à d'autres populations canadiennes, les hospitalisations étaient presque 10 fois plus fréquentes au Nunavik.

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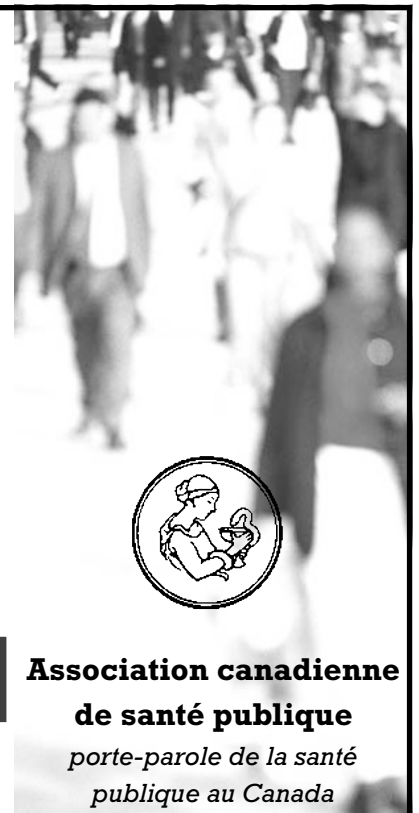
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