

# Evaluation of eczema, asthma, allergic rhinitis and allergies among the grade-1 children of Iqaluit

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# Nothing to disclose



## BACKGROUND

2 million sq. km (800,000 sq. miles), 34,000 population, remote, no trees, very cold, limited EMR use, no chart review is allowed, prohibited research at school.



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## ***Rationale:***

- ▶ No previous study was ever conducted in Nunavut exploring this topic.
- ▶ The area and the population both have unique characteristics
- ▶ Anecdotal findings showed a high prevalence of moderate-severe eczema among the Inuit, with high respiratory illness related hospitalization under the age of 4 years, and a lower prevalence of asthma later on.
- ▶ It is important to find out the actual prevalence of those conditions and figure out risk/ protective factors for proper intervention.

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### *Methods:*

- ▶ A cross-sectional study among grade one students attending schools in Iqaluit, the capital of Nunavut
- ▶ Was conducted during the 2015/2016 school year.
- ▶ We used the International Study of Allergy and Asthma in Children (ISAAC) questionnaire with added questions relevant to the population. In addition, skin prick tests were conducted to test for sensitization to common food and environmental allergens.
- ▶ The ISAAC questionnaire was used as a standardized tool that compared those allergy conditions' prevalence in more than 100 countries among grade 1 and grade 7 children.

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## ***Methods:***

- ▶ Examples of the added questions:
  1. Asking about the ethnicity of the parents to be able to compare different ethnicities
  2. If the child was ever outside Nunavut because sensitization to tree, grass, ragweed or house dust mite may have occurred while outside Nunavut
  3. The number of persons and bedrooms at home to check for crowdedness
  4. History of respiratory illness related hospitalization
  5. Pet ownership
- ▶ The questionnaire, consent and assent forms were provided in English and Inuktitut. An interpreter was always available.

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## *Methods:*

- ▶ The skin prick test was done by myself at the pediatric consultation clinic inside the local hospital.
- ▶ The skin test was done to common inhaled allergens: tree mix, grass mix, house dust mite mix, ragweed mix, weed mix, mold mix, cat and dog.
- ▶ Also to the following foods: peanut, tree nut mix, egg white, cow's milk, soy and wheat.
- ▶ A positive skin test was defined by a wheal  $\geq 3$ mm.

# Participants demography

<b>Total number of grade-1 students 130</b>	<b>Questionnaire 44 (33.8%)</b>	<b>Skin testing 30 (23.1%)</b>
Female gender	18 (41%)	12 (40%)
Ethnicity*		
Inuit	24 (54.6%)	17 (56.7%)
Mixed ethnicity (one parent is Inuit)	13 (29.5%)	7 (23.3%)
Non-Inuit	7 (15.9%)	6 (20%)

\* ~80% of the Iqaluit population has at least one Inuit parent (Stats Canada)

# Main Findings – Questionnaire

	<b>Current Asthma 7 (15.9%)</b>	<b>P-Value</b>	<b>Current Eczema 9 (20.5%)</b>	<b>P-Value</b>
<b>Male n (%)</b>	5 (19.2)	0.39	4 (15.4)	0.45
<b>Female n (%)</b>	2 (11.1)		5 (27.8)	
<b>Ethnicity</b>		0.02		0.88
<b>Inuit n (%)</b>	1 (4.2)		6 (25)	
<b>Mixed ethnicity n (%)</b>	5 (38.5)		2 (15.4)	
<b>Non-Inuit n (%)</b>	1 (14.3)		1 (14.3)	
<b>Ever Outside Nunavut</b>		0.06		0.15
<b>Yes n (%)</b>	7 (21.8)		7 (21.8)	
<b>No n (%)</b>	0		2 (16.6)	

# Main Findings – Questionnaire

	<b>Current Asthma 7 (15.9%)</b>	<b>P-Value</b>	<b>Current Eczema 9 (20.5%)</b>	<b>P-Value</b>
<b>Smoker at home</b>				
<b>Yes n (%)</b>	3 (18.8)	0.16	3 (18.8)	0.15
<b>No n (%)</b>	4 (14.3)		6 (21.4)	
<b>Cat</b>				
<b>Yes n (%)</b>	1 (33.3)	0.25	zero	<b>0.05</b>
<b>No n (%)</b>	6 (14.6)		8 (19.5)	
<b>Dog</b>				
<b>Yes n (%)</b>	2 (14.2)	0.17	6 (42.8)	0.16
<b>No n (%)</b>	5 (16.6)		2 (6.6)	
<b>Exclusively Breast fed</b>				
<b>Yes n (%)</b>	4 (14.8)	0.15	4 (14.8)	0.15
<b>No n (%)</b>	3 (17.6)		5 (29.4)	
<b>Hx Resp Hospitalization</b>				
<b>Yes n (%)</b>	2 (22.2)	0.17	3 (33.3)	0.17
<b>No n (%)</b>	5 (14.3)		6 (17.1)	

# Main Findings – Skin prick test

<b>Positive skin test (<math>\geq 3\text{mm}</math>)</b>	<b>Tree 4 (13.3 %)</b>	<b>Grass 2 (6.7%)</b>	<b>Cat 8 (26.7%)</b>
<b>Ethnicity:</b>			
<b>Inuit n (%)</b>	1 (5.9)	1 (5.9)	4 (23.5)
<b>Mixed n (%)</b>	3 (42.9)	1 (14.3)	1 (14.3)
<b>Non-Inuit n (%)</b>	0	0	3 (50.0)

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## Conclusion

Our study findings reiterated the known higher eczema prevalence at higher latitudes and absent sensitization to house dust mite in very cold climates. The variations between ethnicities living in the same subarctic environment in relation to Asthma may be related to genetic, genetic-environment interaction and lifestyle factors that require further larger scale investigation.

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## Limitations

- ▶ Limitations of this study were related mainly to the small sample size, though it constituted one-third of the targeted cohort.
- ▶ Having a small number of positive cases resulted in a wide confidence interval for some findings leading to uncertainty about the significance of the reported odds ratio.
- ▶ There is a possibility that atopy-positive families were more willing to participate. Thus, selection bias could have been possible.
- ▶ Moreover, the recall bias is a possibility, as with every questionnaire-based study.
- ▶ Also, being a cross-sectional study has its limits in regard to determining causality relationship.
- ▶ A larger scale longitudinal study is highly recommended to avoid such limitations.
- ▶ Despite all those limitations it is still an important study, as such unique baseline data serve as a benchmark for future prevalence studies.