Early Inuit Child Health in Canada

Report 1-Sleep Practices among Inuit Infants and the Prevention of SIDS

Sirisha Asuri, PhD*, Anna Claire Ryan[§] and Laura Arbour, MD*

*Department of Medical Genetics, University of British Columbia
Victoria, British Columbia
[§]Inuit Tapiriit Kanatami (ITK), Department of Health and Social Development
Ottawa, Ontario

INTRODUCTION

For Inuit, "the birth of each child continues to be an event that is eagerly anticipated and cause for celebration"(1).Unfortunately, a recent study found the infant mortality rate to be more than 3 times higher among Inuit infants than the overall Canadian rate. There were 16.5 mortalities/1000 live births in Inuit inhabited areas compared to 4.6/1000 live births in the rest of Canada(2), a rate not seen in the general population of Canada since the early 1970's. In particular, the post-neonatal death rate, described as death within the period of 29 days to one year, was disproportionately high. A contributing factor to this is the elevated rate of Sudden Infant Death Syndrome (SIDS) among Inuit, which was measured at 7.4 times the overall Canadian rate (5.2/1000 vs. 0.7/1000). These results are consistent with those observed a decade ago when studies showed that infant mortality in Canadian Aboriginal populations (including Inuit) was 3-7 times higher than the national rate(3), with preterm birth and SIDS being the two main causes(4).

To gain a better understanding of sleep practices amount Inuit infants, the University of Victoria, in partnership with Inuit Tapiriit Kanatami (ITK), developed this report using data from the 2006 Aboriginal Children's Survey (ACS). The sleep practices of Inuit infants were analyzed and relevant research about SIDS reviewed. The outcomes of this paper reveal the need for health promotion programs, policies and tools, which better support Inuit families and contribute to the prevention of SIDS in Inuit Nunangat.

The 2006 Aboriginal Children's Survey (ACS) was a post Statistics Canada 2006 - census survey which provides information on the health, development and well-being of First Nations, Métis and Inuit children under 6 years of age and living off reserve in urban, rural, and northern locations in Canada. The number of Inuit children included in the survey was 1, 693 of which there were 459 under one year of age and 1, 234 who were aged one to five. At the time of the 2006 census there were 7000 Inuit children under the age of six living throughout Canada. The majority of these children (about 84%) reside in Inuit Nunangat(5). Inuit Nunangat is an Inuktitut term used to describe the collective Inuit homeland comprised of the 4 Inuit land claim regions: Nunatsiavut, Nunavik, Nunavut and the Inuvialuit Regional Settlement (Figure 1).

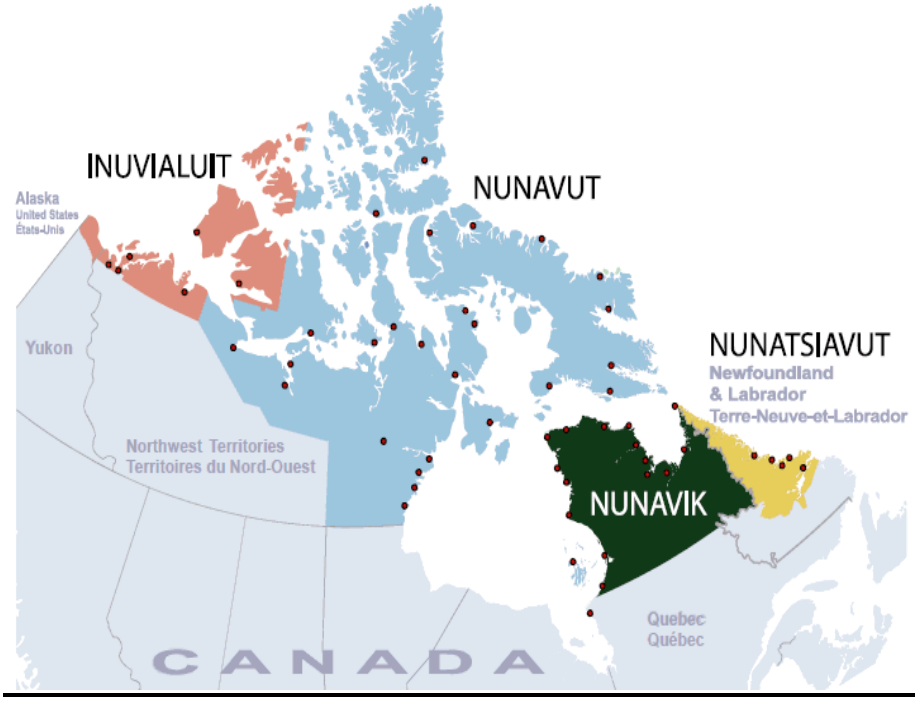

Figure 1: The four regions of Inuit Nunangat. This map depicts the four Inuit Regions in Canada: The Inuvialuit Settlement Region in the Northwest Territories, the territory of Nunavut, Nunavik in northern Quebec, and Nunatsiavut in northern Labrador. **Source:** Inuit Tapiriit Kanatami.

SUDDEN INFANT DEATH SYNDROME (SIDS)

Sudden Infant Death Syndrome (SIDS) is defined as " sudden death of a infant under one year of age which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history"(6). Although no direct cause of death is identified, many researchers have proposed the existence of underlying contributors that when present can result in the sudden death of the infant. However, understanding contributors is not straight forward. A combination of physiological immaturity and/or tissue damage interacting with environmental stressors is suggested to likely contribute to SIDS(7-9) (Figure 2).

Multiple risk factors for SIDS have been identified including anemia, respiratory infection, neurological prematurity and genetic susceptibility(8). Genes that have been of interest are those associated with sudden cardiac death(10-12), fatty acid oxidation disorders, and neurotransmitters(9, 13). One such genetic factor being studied, is a variation in the *CPT1A* gene which is seen commonly in Inuit(14). Whether any of these factors influence the increased rate of SIDS in Canadian Inuit infants is still unknown and more research is needed.

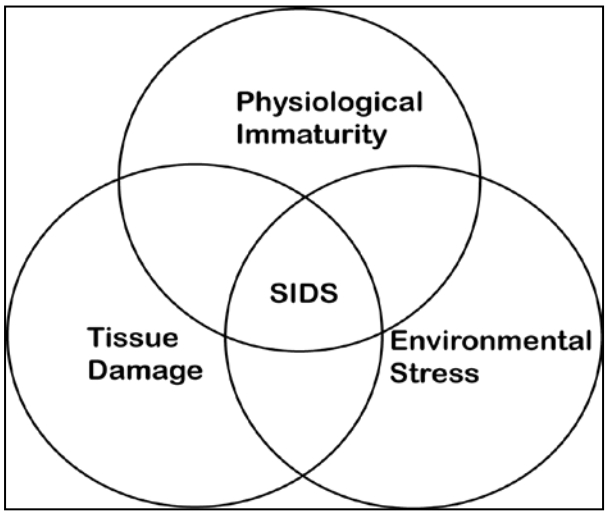

Figure 2: Risk factors Associated with SIDS

Since 1991 when "Back to Sleep" campaigns were first introduced, there has been successful and dramatic reduction in SIDS rates worldwide. Placing infants on their back (supine) and not on their stomach (prone) or side likely overrides some of the susceptibility factors of SIDS. The only previously published report revealing sleep practices in any Inuit region in Canada was for Nunavut in the "*Canadian Maternity Experiences Survey*"(15) which compared regional differences in Canada. The regional rate for mothers placing their infants on their back to sleep was highest in Yukon (87%) and lowest in Nunavut (47%) with about 77% for all respondents across Canada. Although the low rate was concerning for Nunavut, it should be noted that this data may not be representative of Inuit as there were only 60 mothers surveyed in Nunavut, ethnicity was not revealed, and this report collected data from only one of the 4 Inuit land claim regions(16).

Despite efforts, SIDS continues to be the leading cause of death in healthy infants and the third leading cause of infant mortality worldwide(9). The SIDS rate is significantly higher in indigenous peoples of Australia, New Zealand and North America(17, 18). This is a similar situation for those living in Inuit Nunangat.

METHODS

Questions E3 and E4 from the 2006 Aboriginal Children's Survey (ACS) were analyzed for the purpose of this report (Appendix 1). The responses were provided by the caregivers representative of 318 Inuit infants less than one year of age. Question E3 was about bed-sharing practices. Bed sharing is defined as an adult or another child sharing the same sleep surface with an infant. The sleep surface could be a bed, sofa, sleeping mat or armchair(6). Question E4 asked about sleep position of the infant. The two questions were also analyzed together to see if the practice of bed sharing affected sleep position preference.

Regional-specific data was available for Nunavut, Nunavik, and outside Inuit Nunangat but was not available for Nunatsiavut or Inuvialuit Settlement Region because of the small sample sets. Therefore, regional specific information within Inuit Nunangat was not compared. Responses of all those living in Inuit Nunangat were combined and compared to those living outside of Inuit Nunangat. The data request was carried out by Statistics Canada. Further analysis was carried out using GraphPadInStat software(19).

RESULTS

Sleep position

Figure 3 shows that 52% of all Inuit infants surveyed were reported by their caregivers to be placed in the supine (back) position for sleep whereas 48% reported non-back positions. When the data is broken down according to place of residence, 37% of infants residing in Inuit Nunangat were placed to sleep in the back position, whereas, 86% of those respondents living outside of Inuit Nunangat reported that their babies were placed in the back position for sleep ($p<0.0001$).

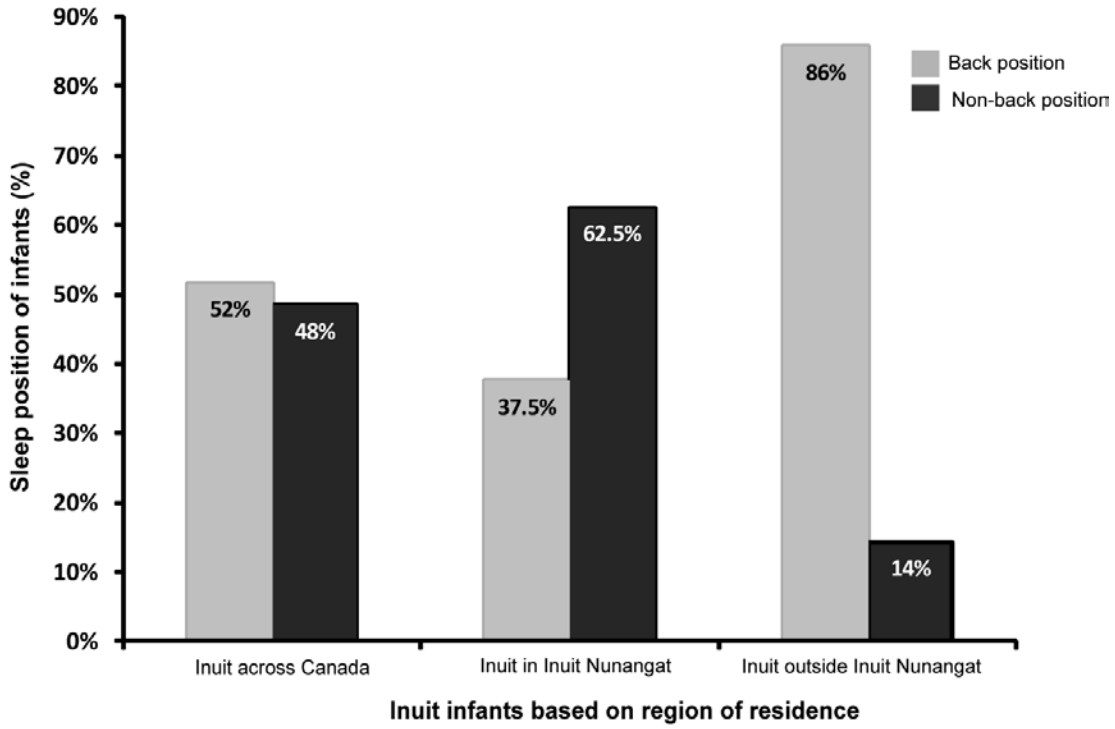

Figure 3: Sleep position of Inuit infants.

Bed-sharing

As shown in Figure 4, 58% of all caregivers of Inuit infants surveyed were found to bed-share either always or at least sometimes. A slightly higher proportion (but not statistically significant) of Inuit infants living in Inuit Nunangat were found to bed-share (63%).

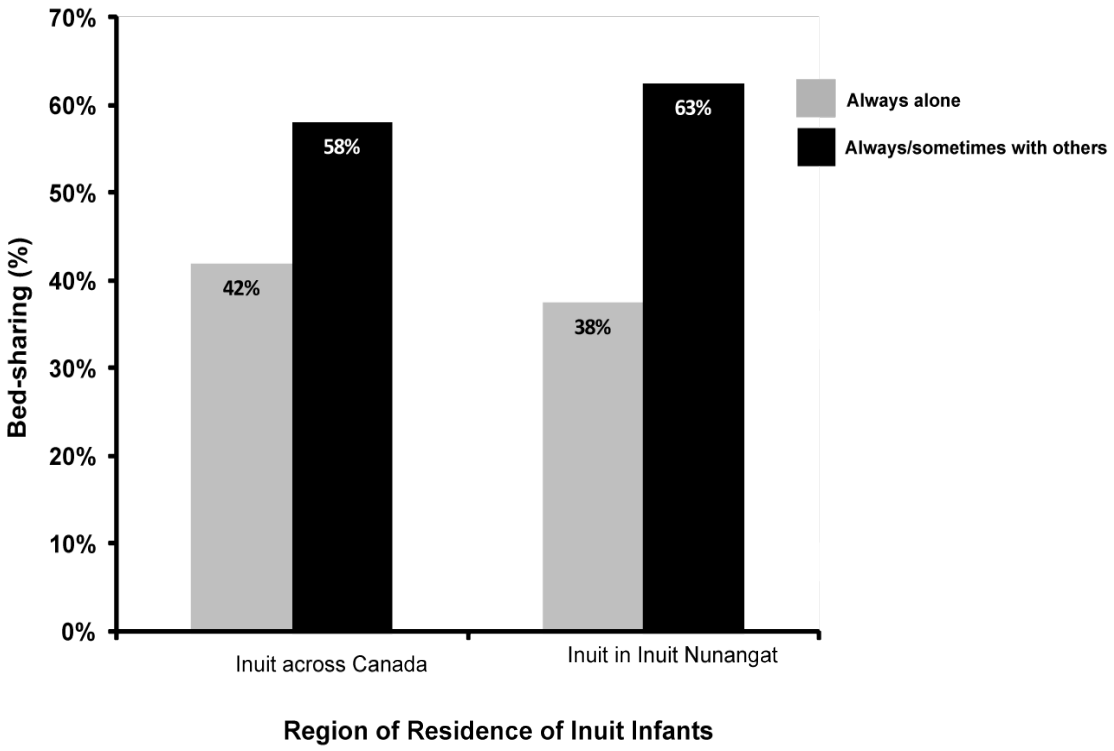

Figure 4: Bed-Sharing.

Sleep position while bed-sharing

For all Inuit regions combined, as shown in Figure 5, those who reported bed-sharing were significantly less likely to place their infant to sleep in the back position. Of infants who slept always alone, 69% were placed to sleep on their back, whereas only 39% of infants who slept with others were placed on their backs to sleep ($p<0.0001$).

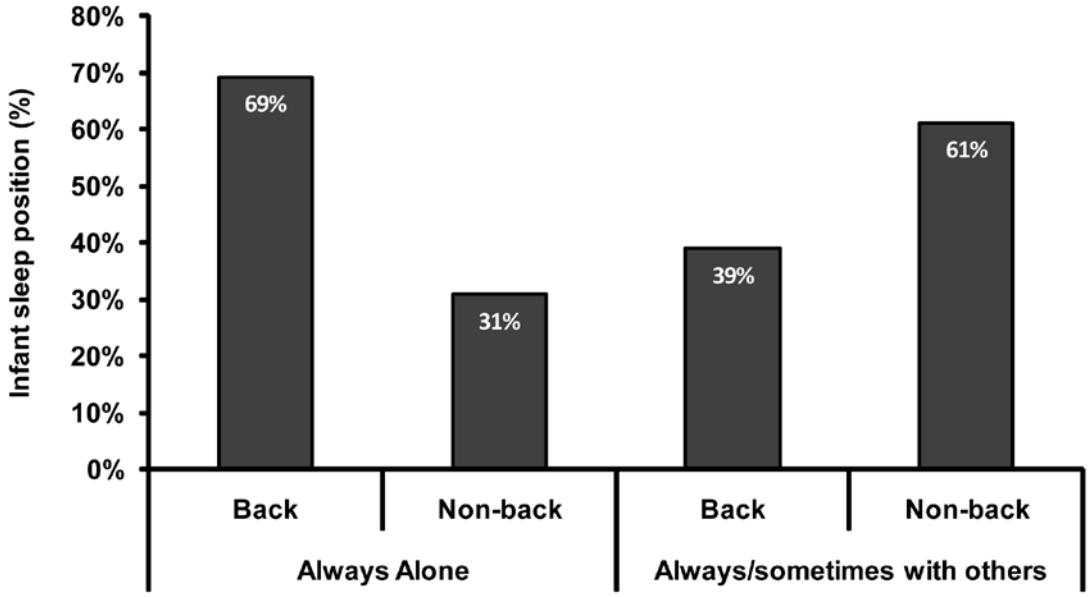

Figure 5: Sleep position of Inuit Infants based on bed-sharing.

DISCUSSION

SIDS and back sleep position

Placing an infant to sleep on their back substantially reduces the risk for SIDS(20). Research shows that sleeping on the stomach can not only result in an "asphyxia microenvironment" that restricts the availability of fresh air and the potential for the re-breathing of exhaled air(21), but also affects the physiological responses(22) of the infant. Stomach sleeping infants have been observed to have decreased arousability (especially in the 2-3 month age when SIDS rate is high)(23, 24) and increased resting heart rates due to increase in metabolic rate and body heat(22, 25) all of which are risk factors for SIDS.

To promote back sleeping in infants, the first nation-wide campaign was initiated in New Zealand in 1991(26) called the "Side or Back to Sleep" campaign (later changed to "Back to Sleep"). It was responsible for the dramatic decrease of SIDS in New Zealand and since then around the world by 50-90%(26, 27). Although back sleeping in the first year of life is now a common practice in most places in Canada and around the world, the 2006 Aboriginal Children's Survey suggests that less than 40% of Inuit infants living in Inuit Nunangat are put to sleep in the back position.

Some public health educational materials have been developed and distributed across Inuit Nunangat. Nunatsiavut, for example, has been using the "Back to Sleep" campaign in their

communities. At least two culturally relevant SIDS awareness publications are available. The first is a factsheet on SIDS, titled "What is Sudden Infant Death Syndrome", developed by Inuit Tuttarvingat at the National Aboriginal Health Organization (NAHO)(28). It is available in English and Inuktitut. The second is the SIDS brochure called "Look up to our ancestors" created by the National Indian & Inuit Community Health Representatives Organization (NIICHRO)(29), which is available in English and French. Both of these documents are being distributed to Inuit communities; however the efficacy of their use has not been evaluated.

Evidence is now available suggesting that infants should be placed on their back to sleep, for every sleep. However, there are multiple factors as to why infants may not be put on their back to sleep. These include advice from friends, family and healthcare providers that the infant sleep in the prone (stomach) position, fear that supine position would cause choking, fear of changes in the head shape of the infant, and poor sleep quality(30). However, the factors affecting infant sleep position among Inuit is not clear. A study, funded by Health Canada, is now underway in Nunavut to better understand infant sleep practices through focus groups with Inuit mothers.

SIDS and bed-sharing

Bed-sharing is common in many cultures and without other risk factors is not necessarily associated with an increase in SIDS(31). Some advocate the benefits of bed-sharing to the developing infant(32). The advantages of bed-sharing, reported by several studies, include increased infant-maternal contact and interaction and increased duration of breastfeeding(33-35), both of which are shown to be protective against SIDS(36).

Bed-sharing has been an important component of Inuit child rearing practices and culture. Traditionally, "after the baby was born, the child assumed its place on the family sleeping platform next to the mother. From the day of birth, the baby was in almost constant contact with the mother, either in the hood of her parka (amauti), or nestled in the front of the parka feeding"(1).

That being said, Inuit elders mention the risks of bed-sharing as noted in "Interviewing Inuit Elders-Child rearing practices" by Uqsuralik. It quotes elder's advice as "We were told to put the baby on top of us. We would never put our breast down to the baby, but had the baby on top of us. If you fell asleep your breast would be away from the baby when the baby was on top of you. You never breastfed the baby while the baby was lying on the bed. This was the advice of the grandmothers and mothers. Sleep can be very deep. Once we fell asleep we could smother the baby and we would never know(37). The term for a baby suffocating while sleeping is *ijjia"(37).*

Despite being a common practice in much of the world, studies have shown that there are factors associated with bed-sharing that may increase the risks of SIDS. Infants sharing a bed with parents and/or other children in unsafe sleeping environments may be exposed to potential

asphyxiation(9). Sharing a sleeping surface such as a sofa, sofa bed, or armchair with another adult or child has been associated with accidental suffocation among infants(9).

According to the responses in the ACS 2006, about 60% of Inuit infants, as reported by their caregivers, share a bed with adults or children. This is likely similar to the rate in other areas of Canada, but there is little population data or research which documents this information(38). This study suggests that when Inuit infants do bed-share, they are less likely to be placed in the back position. If bed sharing is associated with sleep position other than supine, the risk for SIDS may be increased due to the sub-optimal sleep position(39).

Although not explored in this study, maternal smoking and alcohol (and/or drug) use is considered the highest modifiable risk factor in SIDS(40). It is proposed that 1/3 of all SIDS deaths may be preventable if infants were not exposed to cigarette smoke in utero(41). Recent research in Nunavut found that 64%-80% of women in the Qikiqtaaluk region report smoking prenatally(15, 42).

Some modifiable risk factors associated with SIDS include(43):

- Infants put to sleep in positions other than back (supine)
- Infants put to sleep on unsafe sleep surfaces such as loose bedding/clothing which may cover the face and head of the infant and cause suffocation
- Hyperthermia or overheating
- Bed-sharing with an infant on a soft mattress or piece of furniture such as a sofa or armchair
- Infants sharing a bed with an adult who has consumed alcohol, sleep aids or who are excessively fatigued
- More than one adult sharing the bed with the infant.
- Prenatal and/or post-natal exposure to tobacco smoke and/or alcohol

CONCLUSION

For Inuit, “the birth of each child continues to be an event that is eagerly anticipated and cause for celebration”(1). When a baby is lost to SIDS the tragedy is felt widely; by the parents and in the community. Education about safe sleep practices has been found to reduce the likelihood of SIDS. This study can be used as a baseline to move forward to develop public health promotion progams with Inuit based on the responses provided in the 2006 Aboriginal Children’s Survey. According to this survey, Inuit infants are most often placed to sleep in positions other than the back position. For those who do bed-share, even fewer are reported to be placed on their back to sleep. More information is needed to understand whether the information derived from

caregivers of Inuit infants in 2006 is still true today, and if so, more information is needed to understand how we can better support Inuit families living in Inuit Nunangat.

LIMITATIONS

- Data used for these analyses was derived from the ACS 2006 which is a nationwide survey and hence carries certain limitations. Although technical advisory groups consisting of aboriginal advisors, parents, and early childhood educators were involved in the design of the survey, the questions may be understood differently by people answering them.

- Also, though the questions were all translated into aboriginal languages and aboriginal interviewers were used for the most part, there remains the possibility of interpretative misunderstandings and linguistic and/or cultural barriers.

- The ACS did not collect data on maternal smoking or substance use. Hence these parameters were not considered in the results of this report, despite being important considerations in the area of preventable causes of SIDS. Further research should include other important determinants of SIDS to ensure comprehensive programs in prevention are put in place.

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APPENDIX 1

Q.no	ACS Section	Question
E3	Sleep	Does ___ usually sleep alone or in a bed with parents or others? *INTERVIEWER: By alone, this refers to sleeping alone in bed, not alone in their room. Mark all that apply.* 1)Alone, 2) In a bed with parents or others, 3) Don't know, 4) Refused
E4	Sleep	At bedtime, what positions do you put_____ to sleep in? 1) On stomach, 2) On side, 3) On back, 4) Other 5) Don't know, 6) Refused