

# Thyroid function and autoimmunity among populations in Greenland with 10 and 20 years follow-up

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# Kinaavunga?



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- To assess the occurrence of thyroid autoimmunity among Inuit and non-Inuit populations in Greenland with different iodine intake levels
- To evaluate the influence of POP's on thyroid function among Inuit and non-Inuit populations in Greenland

# Background

- Iodine intake level is important for the occurrence of thyroid disorders
- Low iodine intake can cause a wide spectrum of conditions such as
  - Goiter
  - Thyroid dysfunction
  - Developmental brain damage and
  - Cretinism

# Background

- WHO recommended daily iodine intake
  - 50 µg for infants <12 months of age
  - 90 µg for children <6 years of age
  - 120 µg for school children
  - 150 µg for adults (> 12 years of age)
  - 200 µg for pregnant and lactating women

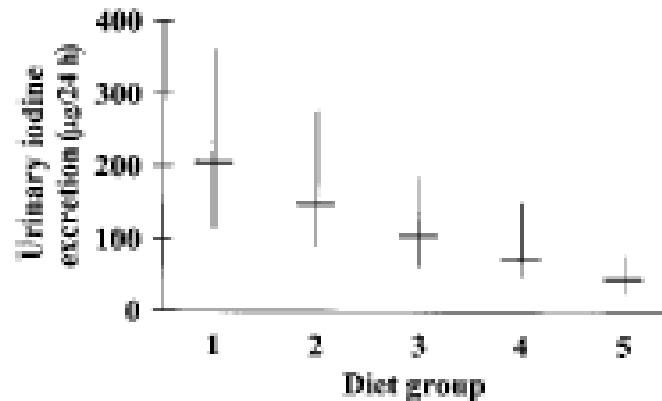


# Background

- Iodine sources in the diet



# Background



**FIGURE 3.** Estimated 24-h iodine excretion by diet groups 1–5 in participants not taking iodine-containing supplements (median and 25th and 75th percentiles). Urinary iodine excretion fell with decreasing intake of Inuit food items ( $P < 0.001$ , Kendall's  $\tau$ :  $-0.32$ ;  $n = 482$ ). Diet groups were computed from an interview-based food-frequency questionnaire: diet group 1 had scores of  $>80\%$ , diet group 2 had scores of  $60\text{--}80\%$ , diet group 3 had scores of  $40\text{--}60\%$ , diet group 4 had scores of  $20\text{--}40\%$ , and diet group 5 had scores of  $<20\%$  for Inuit food items ( $n = 241, 110, 80, 60,$  and  $41$  in groups 1–5, respectively).

ANDERSEN ET AL. *Am J Clin Nutr* 2005;81:656–63.

# Background

- The occurrence of thyroid autoimmunity and dysfunction increases with a rising iodine intake
  - Andersen et al. *Maturitas*, 2009, 64:126-131.

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- Greenland Inuit has developed a genetic susceptibility to metabolic disorders
  - Fumagalli et al. *Science*, 2015, 349:1343-1347
  - Speculated to be due to adaptation to the lifestyle of Arctic habitat.

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  - Speculated to be due to adaptation to the lifestyle of Arctic habitat.
- Has the iodine rich traditional Inuit diet caused an adaptation to high-normal iodine intake levels?
  - Ethnic differences in thyroid dysfunction and in thyroid autoimmunity?

# Background

- The traditional Inuit diet consists of fish, birds and sea mammals
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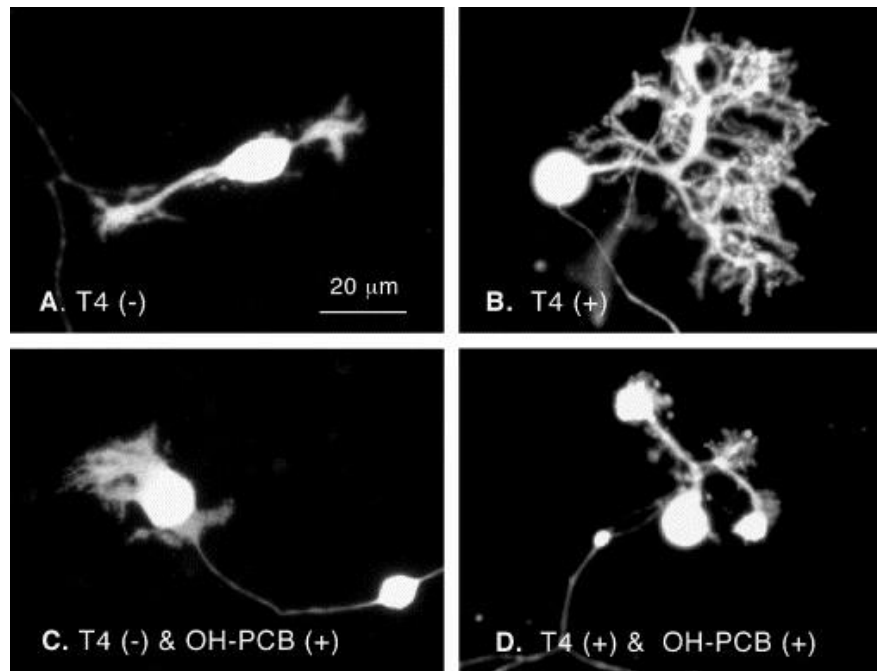
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- These are known to contain high levels of polyorganic pollutants (POP)
  - Bjerregaard et al. Science of the Total Environment, 2000, 245:195-202.
- POPs have capabilities as endocrine disruptors
  - Bonfeld-Jørgensen et al. Toxicology, 2001, 158:141-153.



# Background

- and block the effect of thyroid hormones on the neuronal development

- Kimura-Kurod et al. Chemosphere 2007, 67:S412-S420



## Methods

- Data collected in 1998 repeated 2008
  - 50-69 years old men and women
  - Nuuk and Ammassalik incl. Settlements
  - Interview-based questionnaires – lifestyle and dietary
  - Physical examination
  - Blood tests and urine samples
- Collection of similar data is scheduled for 2018



## Ethical considerations

- Approved by the Ethics Committee for Greenland
- Helsinki declaration was observed
- Informed written consent in Danish or Greenlandic
- Participation is voluntary
- Consent can be withdrawn by participants at any time

## Ethical considerations

- The study aim to elucidate the occurrence of a frequent dysfunction with importance for the load of diseases in the population
- The results may have implications for the dietary recommendation in Greenland and other Arctic populations
- The results will be made available for the public and for Greenland Government

## Perspective

- Prevention of thyroid diseases by ensuring an optimal iodine intake is a high priority among health care providers
- The optimal iodine intake level depends on the association with the occurrence of thyroid disorders
- WHO recommends monitoring of all populations
- Findings of this study may have implications for the monitoring program in Greenland

# Qujanaq

## Apeqqutissaqarpisi?