

# Report from the Inuit Health in Transition Pilot Study in Disko Bay, Greenland, 15-26 September 2003

*Peter Bjerregaard, September 2003*



Adolf Jensen at anchor off Saqqaq

## **Abstract**

In September 2003, three villages in North Greenland were visited by boat by a team of eight investigators. The main purpose of the trip was to field test data collection procedures and obtain estimates of the time and staffing needed, and of expenses. A total of 99 participants were enrolled in the study at a cost of 3,940 DKK per participant. A need was experienced to revise the recruitment procedure, to revise and reduce parts of the questionnaires, to reduce blood sampling, and to increase the number of days spent in each village. Electronic equipment was found to be vulnerable to the harsh conditions of travel. It was feasible to offer an oral glucose tolerance test to all participants.

## **Purpose**

The purpose of the study was to field test several data collection instruments in a realistic setting including the use of a chartered research vessel to visit the villages in Northern West Greenland. Further to collect data for the international study of Inuit Health in Transition.

## **Narrative**

The data collection team consisted of 8 persons:

- Peter Bjerregaard, Copenhagen. Physician, team leader and supervisor
- Ingelise Olesen, Nuuk. Midwife, clinical assistant and interviewer
- Maja Lis Halkær, Copenhagen. Lab. technician
- Karo Thomsen, Ilulissat. MA, interviewer
- Astrid Olsen, Ilulissat. Health aide, interviewer and contact person
- Aba Nathanielsen, Ilulissat. Kitchen supervisor, interviewer
- Søren Brage, Cambridge. Ph.d. student, physical exercise measurements
- Nina Martinsen, Copenhagen. Bachelor of Public Health, clinical assistant

We met in Ilulissat on Monday, September 15, 2003 where the 167 BRT and 28 m ship Adolf Jensen was waiting for us in the harbour with its crew of 5. Most equipment and materials had been shipped to Ilulissat beforehand; some was carried by hand from Copenhagen, blankets were borrowed from the local hospital and various purchases were done in local shops. Due to a very efficient teamwork, we were ready to sail already at 9 pm.

Adolf Jensen has 3 single cabins for passengers, one 3-person cabin and 2 free bunks in the crew's quarters. There is a cold storage room, a big  $-20^{\circ}$  freezer and a laboratory cum office equipped with a computer, printer and photocopying machine. There is adequate storage space. It is owned by Greenland's Institute for Natural Resources and is well suited for expeditions as ours. A cabin can be used for blood sampling and the lab is big enough for our purposes. We brought our own cooling centrifuge. The rental price was 15,000 DKK per day plus 150 DKK per person per day for food.



Tuesday morning we woke up at anchor outside Saqqaq, the biggest village in Ilulissat municipality (pop. 191). There is no jetty for ships Adolf Jensen's size and equipment and passengers were transported to shore by rubber dinghy. The team was instructed in data collection procedures and the equipment was installed in the village hall. A few interviews (Questionnaire 1) were performed. At night we had invited all inhabitants to a meeting to explain the study and answer questions but relatively few turned up (10-12). Prior to our arrival, posters had been put up in various places in the village announcing our arrival and the health aide had a list of persons interested in participating; unfortunately she was out of town and the list could not be found. We obtained a map from the village office with B-numbers and divided the village into four parts, one for each interviewer to visit and recruit from. Apart from a payphone in the shop the village is quite isolated.



Disko Bay with the three villages visited

Wednesday was our first day of clinical examinations and the best word to describe it is "chaotic". Fortunately, we knew from previous experience that this is usually the case the first day with a new team. The vulnerability of modern technical equipment was stressed by the fact that the (brand new) electronic scales had been damaged by water and that the monitor of the ultrasound equipment gave up after app. 20 minutes. We managed with borrowed scales of varying quality and a small TV-set for the ultrasound but were not able to record the ultrasound readings on videotape as planned. Thursday and Friday went much smoother apart from the gale that necessitated Adolf Jensen to cast anchor at some distance from the village and gave us a rather perilous journey in the rubber dinghy. It was our general impression that people were very helpful; many held full-time jobs, participants usually kept their appointments and showed up at the agreed time – much more so than in the towns we have visited earlier.



Saturday we finished around Noon after 3½ days of work in Saqqaq and proceeded to Qeqertaq. There was some wind and Adolf had problems with a broken clutch pipe. On arrival in Qeqertaq we couldn't manoeuvre and had to cast anchor a short distance from the jetty. However, Alex, the machinist, managed to repair the pipe provisionally and we docked before night. In Qeqertaq we managed to use the school on day one and then the service house. We can actually manage with as little as app. 20 m<sup>2</sup> for the clinical part of the study, but it is a difficult task to keep contact with the interviewers when they are spread over most of the village. As Adolf Jensen was able to dock, we tested to have welcome, informed consent and blood sampling on board, and this turned out to function well.

We worked in Qeqertaq for three days. The first evening we had invited everybody to a meeting at the school, and after the information about the study there was singing and music by Adolf Jensen's crew followed by dancing to music by Erneeraq Lindenhahn. The turn up was better than in Saqqaq and everybody had fun. Tuesday afternoon we proceeded to Ilulissat, spent the night there and departed Wednesday morning at 5 am for Ilimanaq. We had already arranged for 12 participants to be fasting and had two full days of clinical examinations in Ilimanaq. Thursday evening we had finished and departed for Ilulissat, Friday we packed and shipped everything. We had to finish a bit earlier than originally planned because the shipments could not be done on weekends.

## Study outline

The data collection comprised the following

- an interviewer administered questionnaire on diet (24 hr recall and FFQ with portion sizes) and sociodemographic variables (Questionnaire 1)
- an interviewer administered questionnaire on health, diseases, physical activity, smoking and health care (Questionnaire 2), and a self administered questionnaire on mental health and the use of alcohol (Questionnaire 3)
- fasting blood sampling
- a 2 hr oral glucose tolerance test
- anthropometric measurements
- ECG and blood pressure
- ultrasound of abdominal wall and liver fat
- measurement of 2 days' physical activity

Data collection was arranged in stations (fig. 1). The planned flow was not rigorously adhered to, but was occasionally changed due to local circumstances. For instance, in one village the visit could not be extended beyond two days wherefore we started out by securing as many fasting blood samples and clinical examinations as possible and performed interview 1 later in the day.

The team was too small and the available time too limited to perform all measurements on all participants. The OGTT was offered to all participants until app. 10 am except on one day of early departure; almost all accepted the offer. The clinical examinations (anthropometry, ECG,

blood pressure, ultrasound) were performed by two team members one of whom was often engaged in blood sampling; it was consequently decided to obtain anthropometry, ECG and blood pressure from all participants and ultrasound only when there was time enough. Questionnaire 2 was reduced somewhat during the pilot study. Finally, the measurement of physical activity was not part of the core study and was only done in a subsample.

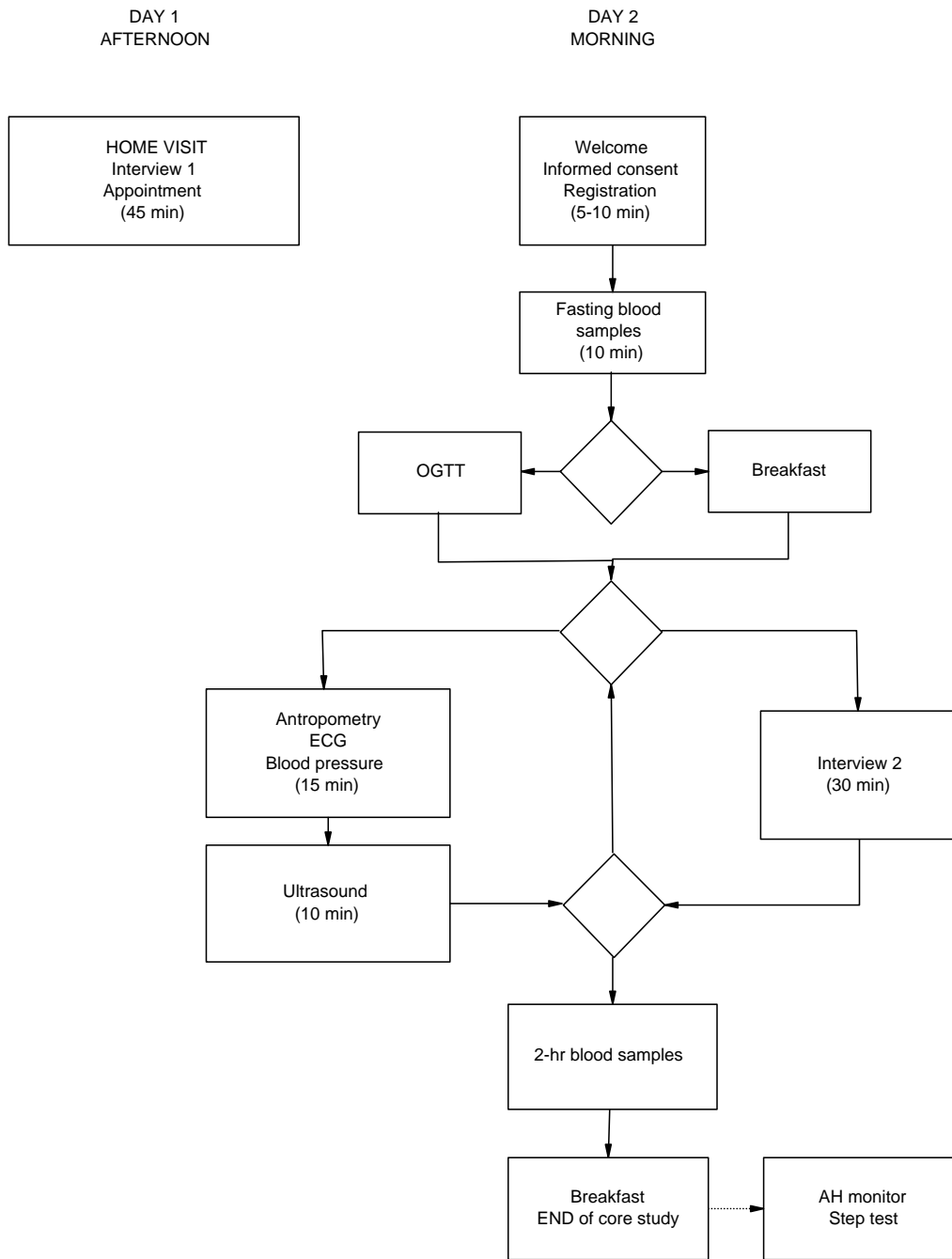


Figure 1. Flow diagram of the study



Coming on board in Saqqaq



Knocking on doors to recruit participants



Examination room in Ilimanaq



Drawing of blood on board Adolf Jensen



ECG



Ultrasound of the abdominal wall



Coming on board in Qeqertaq



Adolf Jensen at the jetty in Qeqertaq

## Data collected

A full data set comprising questionnaires 1 & 2, fasting blood samples, anthropometry, blood pressure and ECG was obtained from 99 participants (table 1). Other data was collected as shown in table 2. On 8 full days of clinical examination an average of 12 examinations per day were done.

Table 1. Population and participation rates. Disko Bay Pilot Study, 2003.

Village	Population aged 25+ <sup>1</sup>	Revised population 25+ <sup>2</sup>	Revised population 25+ <sup>3</sup>	Participants	Participation rate %
Saqqaq	111	83	82	37	44.6
Qeqertaq	77	70	63	33	47.1
Ilimanaq	59	56	52	29	51.8
Total	248	209	197	99	47.4

<sup>1</sup> according to census

<sup>2</sup> excluding non-Greenlanders, persons who had permanently moved; including newcomers

<sup>3</sup> persons actually present in the village (revised population excluding those out fishing for a longer period)

The participation rate was 65% among women and 31% among men. Overall there were no age differences. For women participation rather increased by age to 81% among the 65+ year old, but this was based on only 16 women in the age group. Male participation decreased slightly from village to village (from 33% to 27%) while female participation increased (from 58% to 73%); this was not statistically significant.

Table 2. Data collected in the Disko Bay Pilot Study, 2003.

Type of data	No. of participants	Percent	Time (min.)
Questionnaire 1	99	100	27 <sup>1</sup>
Questionnaire 2	99	100	52 <sup>1</sup>
Self administered questionnaire	98	99	n/a
Fasting blood sample	99	100	16-21 <sup>2</sup>
OGTT	73	74	n/a
Anthropometry, ECG and blood pressure	99	100	10-15
Ultrasound	57	58	10
Physical activity	35	35	n/a

<sup>1</sup>After three days

<sup>2</sup>including welcome and informed consent

There was as expected a wide variation in the time spent for the interviews. During the first days of interviewing the time spent per interview decreased significantly, from a total of 115 minutes for the two questionnaires together on day one to 86 minutes after day three. The performance of the four interviewers also varied significantly (table 3) but this does not take the quality of the interviews obtained into consideration.

Table 3. Time (minutes) per interview after the three first days. Disko Bay Pilot Study 2003.

Interviewer code	Questionnaire 1		Questionnaire 2	
	mean (SD)	range	mean (SD)	range
1	55 (12)	35-85	22 (7)	15-35
2	64 (15)	37-85	36 (10)	23-60
3	42 (16)	25-75	20 (0)	20-20
4	48 (17)	15-80	27 (8)	15-40
All	52 (17)	15-85	27 (10)	15-60

As a planning figure it is proposed to take the 80% percentile, i.e. mean plus 0.84 SD. This equals 66 minutes for Questionnaire 1, 35 minutes for Questionnaire 2 and 101 minutes for the two questionnaires together.

Team members from Copenhagen and Nuuk were under way for 15 days; Adolf Jensen was chartered for 13 days counting two half days in the beginning and the end as one whole day each; we were in the villages for 10 days and had 8.5 days of clinical examinations – one day less than planned due to the need to ship the questionnaires and data before the weekend.

### **Lessons learned**

The overall conclusion is that it is feasible to conduct a study like this in the villages in Greenland but that certain revisions of the design are necessary to improve performance. Below the overall observations are listed, while a more detailed list of observations made is found in the appendix.

- the preparations for a field trip should be more elaborate and include training of interviewers
- recruitment of participants should be improved in particular the recruitment of men
- the team size should not be less than eight persons including a supervisor
- more time should be spent in each village
- questionnaires and blood sampling should be reduced
- questionnaires need revision including linguistic revision
- oral glucose tolerance test can be offered to all participants with some restrictions for practical reasons
- finally, ultrasound of the abdominal wall and measurements of physical activity should only be done in a subsample of participants in the towns.

### **Data handling**

The questionnaires have been sent by airmail to the National Institute of Public Health and the biological samples have been shipped frozen by boat to Steno Diabetes Centre. We decided not to photocopy the questionnaires or divide each participant's biological samples into two shipments.

Upon arrival, the biological specimens will be stored at  $-80^{\circ}$  at Steno; glucose, insulin, HbA1c, and urine albumin will be analysed at Steno while lipids, FFA and Ocs will be analysed elsewhere. Analytical procedures are described elsewhere.

Questionnaire data and other information will be entered on the computer in-house at NIPH according to a procedure described in detail elsewhere.

### **Expenditures**

The accounts have not been finished yet. The estimated total expenses for data collection amount to DKK 390,000, excluding VIP salary, data entry and lab analyses. This is equivalent to DKK 3,940 per participant, compared with DKK 1,100 per participant in the 2000-2001 population survey in Qasigianguit town. The major item was the boat charter at DKK 195,000 (DKK 15,000 per day).

## Follow-up

Three budget alternatives will be explored.

- 1) use of public transport instead of a boat charter
- 2) use of small boat charter for transport between villages
- 3) use of helicopter charter

The data will be analysed with particular emphasis on

- obesity measures (waist circumference, BMI, ultrasound)
- dietary measures (24 hr recall, FFQ, free fatty acids)
- SF-12 (participation rate, meaningfulness)
- physical activity (questionnaire, measurements)

The design and questionnaires will be reduced and revised according to the findings.

Blood sampling and recruitment procedures will be revised.

A field test of the revised survey instruments will be considered for the spring of 2004, possibly in Ilulissat town.

Finally, a general design for the main study will be developed before the end of 2003 and applications for funding will be submitted from early 2004.

## Suggestions for the main study

Based on the experience from the pilot study the following general design should be considered for data collection in the villages:

- improved preparations before arrival
- 1-2 days' training of interviewers before the actual data collection
- a general information meeting in the village the first evening
- subsequent recruitment by house-to-house calls and possibly short dietary interviews
- the first few days a new team can handle 8-10 examinations, later on 12-14 or more

Table 4. Stations, language requirements and estimated time for procedures. First appointment 8.00, last OGTT 11.00, last participant finished 13.00.

Station	N	language	Time	Theoretical no. of participants
Registration, informed consent, fasting blood samples, OGTT	1.5	G	15-20 min	13
Interview	3	G	30 min	13
Anthropometry, ECG and blood pressure	1	either	10-15 min	16
Ultrasound of abdominal wall	1	either	10 min	24
2-hr blood samples		either	5 min	
Goodbye		G		
Laboratory	1	either		
All	7	4 G	1 hr 20 + 1 hr waiting	

The minimum team size is 8 including a supervisor. At least 4 must be fluent in the Greenlandic language; of these at least one must also be able to take blood samples. One should always be in the examination room and act as interpreter if needed. The supervisor can take 2-hr blood samples, run errands and serve as communication link between stations but should not be confined to one of the stations. With this team size, a realistic target is 12 participants per day but recruitment is expected to become a bottleneck once 50% participation has been obtained. Other bottlenecks are the welcome and fasting blood sampling, and the interviews. Solutions could consist in having one person responsible for registration and one

for fasting blood sampling, and in reducing questionnaire 2. Informed consent could furthermore be moved to recruitment and questionnaire 1.

Table 5. Task of team members.

<b>Team member</b>	<b>Morning task</b>	<b>Afternoon task</b>
Interviewer & clinical assistant	Welcome, fasting blood samples, OGTT	Recruitment and interview 1
Clinical assistant	Anthropometry, ECG and blood pressure	Preparation of vials for next day
Clinical assistant	Ultrasound	Preparation of vials for next day
Interviewer	Interview 2	Recruitment and interview 1
Interviewer	Interview 2	Recruitment and interview 1
Interviewer	Interview 2	Recruitment and interview 1
Lab. technician	Preparation of samples; blood sampling	Preparation of vials for next day
Supervisor	Supervision; 2-hr blood samples and other tasks	Preparation of paperwork for next day; keeping of records

3-4 weeks on board is the maximum time. Two weeks are fine and one more week would have been OK but then there is a need for a weekly day off.

### Conclusion

The overall conclusion is that it is feasible to conduct data collection by boat in the villages of Greenland. There are, however, a number of caveats and the data collection instruments as well as the procedures must be revised and tuned to optimal performance. It is advised to reduce the data collection further and to increase the team size. The participation rate was much too low and special attention must be paid to the recruitment of participants. It might be considered to conduct a new pilot study in Ilulissat town in spring 2004 when all procedures and questionnaires have been revised.



In appreciation of the great work done by Maja Lis, Karen Marie, Flemming, Nina, Ingelise, Steffen, As-  
trid, Karo, Aba, Søren and the absent Kristian and Alex.

The study was financially supported by the Environmental Health Foundation of the Danish Ministry for the Interior and Health, the Danish Medical Research Council and the Medical Research Council of Greenland. The Commission for Scientific Research in Greenland had ethically approved the study. All participants gave their informed consent in writing. We thank the health care services of Ilulissat for their kind co-operation and loan of facilities.

**Appendix**

**Detailed observations  
Information to participants in Greenlandic and Danish language  
Informed consent form in Greenlandic and Danish language**

## Detailed observations

### Before the study

- the checklist should appear on the registration paper which should be placed first in the folder to give an instant overview of the name and ID numbers as well as the examination status
- any field trip should begin with 2-3 days of interviewer training.
- team members should be socially competent, agile and not prone to get seasick
- the participants might be given ID numbers before the start of the study
- checklist of all equipment, papers and consumables
- examination in relation to monthly or fortnightly payments of salary reduces attendance
- carry bag or rucksack with logo for the interviewers
- certain ID numbers are easily confused – avoid similar figures next to each other
- more preparations can be done beforehand. Blood vials can be labelled; questionnaires and other papers can be arranged in sets; participants can be assigned ID numbers (but we cannot at the same time assign ID and label the questionnaires because we do not want to bring 50% unused questionnaires)
- arrange a training course for research assistants: interview techniques by Karo and Ingelise; dietary interview by Tine. Is the Centre for Health Education interested?

### Recruiting participants

- the definition of the population is a problem. How can we make sure that the interviewers visit everybody and record whether or not they want to participate? We need more time in each village
- the population lists do not have B-numbers, can we get such lists from the municipality?
- obtain maps of the villages with B-numbers
- increase no. of interviewers
- reduce and combine the questionnaires – leave afternoon free for recruitment
- involve the local health aides
- give special consideration to recruitment of men
- compensate participants for the time spent, e.g. DKK 500 per person?

### During the study

- daily briefings with the whole team are necessary but difficult to realize
- all participants should follow the same procedures and sequence, i.e. Interview 1 and recruitment on day 1, the rest on day 2 or later.
- however, consider fasting blood sampling early in the morning and the rest in the late afternoon – for those working
- it is important that someone is responsible for welcome and blood sampling also later during the day
- the supervisor has an important role: check that all procedures have been followed and that all material is marked with ID; make the daily working schedule; be the one to maintain an overview; be available; authorise additional expenses etc. This role cannot be dispensed with but is not a full-time job. However, it is somewhat contradictory to assign a post to the supervisor.
- a physician comes in handy when the ECG is abnormal, the blood pressure is high and in other cases, but is not indispensable
- blood sampling can take place on board or in the village
- how should we manage abnormal ECGs?
- how critical is the information about the duration of the 2 hr OGTT? If 120 min is really critical, procedures must be improved – and watches synchronized
- calibration of weighing scales?
- it is important that both participants and team are occupied throughout the examination period; a realistic estimate of the duration of each procedure is therefore necessary
- there should always be a Greenlandic speaking person in the examination room.
- one day off every week, spent on shore, rented house
- rooms for interviews should be given as high priority as rooms for examinations. Interviews on board the boat?
- contact between team members may be kept with walkie talkies

- ready made glucose water, alternatively weighed glucose powder in bottles for adding water
- the team members need a change in their daily routines; should be trained in different tasks so that they can alternate. Karo is already part trained in blood sampling; students can be trained in lab routines
- start at 7 am? Change the ship's routines with regard to meals? Lunch at 1 or 2 pm?

#### Questionnaires

See questionnaires with notes and Karo's revisions for further details.

#### Questionnaire 1

- the questions about the use of sugar repeat the 24 hr interview
- the worst part of the dietary questions is the FFQ for Greenlandic food and the main problem is seasonal variation. Suggestion: how often do you eat this when it is in season? and How long is the season?
- Question 6 about physical activity at work should be removed
- can we drop recipes in the 24 hr recall?
- can we drop the 24 hr recall altogether?
- can we leave out portion sizes for the FFQ?

#### Questionnaire 2

- There is too much text to read in SF-12
- SF-12 first question: use the original version
- all new questions must be revised, back translated and further revised
- the physical activity questions must be revised and reduced. Why is TV watching and sitting for other purposes two questions? Several duplicates in Q 34-36
- the questions about health care are time consuming
- do we need to record the time of OGTT and 2 hr blood samples in the questionnaire?
- Q37 "been on the land" duplicates a question at the end

#### Self administered

- ilaqarusukkaluarlutit – to be together sexually

#### Equipment

- modern technique is vulnerable. Wherever possible use mechanical instead of electronic equipment (scales e.g.)
- the centrifuge needs earthing, the other equipment not. Yet, noise on ECGs might have been avoided (but we ran it on battery when the noise was especially pronounced)

#### Blood sampling

- capillary blood for HbA1c is time consuming; must be analysed on venous blood
- need to draw less blood, especially for the biobank. Scrutinize procedures.
- a cooling centrifuge is needed for glucose and FFA – can this be changed?

## Kalaallit Nunaanni innuttaasunik misissuineq 2003

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Peter Bjerregaard  
Ilisimatooq  
København

Eskild Boeskov  
Nakorsaaneq  
Ilulissat

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## Befolkningsundersøgelsen i Grønland 2003

Der gennemføres i 2003 en helbredsundersøgelse af befolkningen i bygderne i Ilulissat kommune. Vi vil med denne henvendelse opfordre dig til at deltage i undersøgelsen.

Formålet med undersøgelsen er at studere forekomsten af især hjertesygdomme og sukkersyge, således at man fremover kan blive bedre til at forebygge dem. Vi lægger særlig vægt på at undersøge sammenhængen mellem kost, fysisk aktivitet og sygdom og planlægger at efterundersøge deltagerne om 10 år.

Vi beder dig om at deltage i en undersøgelse, der varer ca. 1½ time. Forud for undersøgelsen skal du faste (ikke spise eller drikke) i mindst 8 timer og du må heller ikke ryge. Du får taget blodprøver og hjertekardiogram (ekg), bliver interviewet om dit helbred, får målt blodtryk, og bliver målt og vejjet. Der bliver lavet en ultralydsundersøgelse af halspulsåren, hjertet og maven. Nogle af deltagerne bliver bedt om at gå med en lille monitor i et par dage for at måle deres puls og fysiske aktivitet. Prøverne er helt ufarlige og medfører ikke noget ubehag.

Blodprøverne bliver analyseret for blandt andet kolesterol, fedtstoffer, blodsukker og forureningsstoffer (kviksølv og andre stoffer). Nogle af disse resultater kan fortælle om du måske har øget risiko for sygdom; disse resultater skriver vi til dig om. Andre af resultaterne fra blodprøverne har kun videnskabelig interesse. Hvis du alligevel gerne vil have oplyst disse resultater, gør vi det gerne, hvis du skriver og beder os om det. Blodprøven vil blive opbevaret under sikre forhold på Steno Diabetes Center i København indtil forskningsprojektet er afsluttet.

Det er naturligvis helt frivilligt at deltage, og du kan til enhver tid trække dig ud af undersøgelsen. Vi vil gerne have mulighed for at meddele dig resultaterne af blodprøverne, og vil også gerne kunne gentage undersøgelsen om 10 år. Undersøgelsen er derfor ikke anonym, men oplysningerne om dit navn vil blive kodet, således at kun særligt autoriseret personale får adgang til dem, og kun når vi skal i kontakt med dig. Undersøgelsen finansieres af Grønlands Sundhedsvidenskabelige Forskningsråd, Statens Sundhedsvidenskabelige Forskningsråd og Indenrigs- og Sundhedsministeriets Miljømedicinske Forskningscenter.

Hvis du ønsker yderligere information om undersøgelsen, eller hvis du senere ønsker at trække dig ud af undersøgelsen og få dine oplysninger og blodprøver destrueret, kan du henvende dig til en af nedenstående.

Venlig hilsen

Peter Bjerregaard  
professor  
København

Eskild Boeskov  
chefdistriktslæge  
Ilulissat

Undertegnede har fået skriftlig og mundtlig information om projektet og ønsker at deltage i helbredsundersøgelsen. Jeg accepterer samtidig, at eventuelt overskydende blod kan gemmes indtil projektet ophører.

Jeg kan til enhver tid trække mig ud af undersøgelsen ved skriftlig henvendelse til projektledelsen. Mine blodprøver vil da blive destrueret.

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Jeg giver hermed tilladelse til at resultaterne af blodprøver og andre undersøgelser sendes til Ilulissat Sygehus.

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