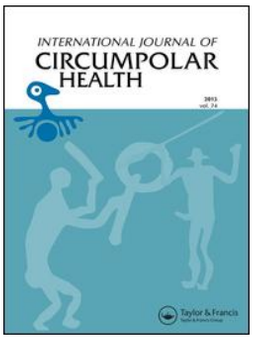

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Inuit health in Greenland: a population survey of life style and disease in Greenland and among Inuit living in Denmark

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INUIT HEALTH IN GREENLAND
A population survey of life style and disease in Greenland and among Inuit living in Denmark

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ABSTRACT

During 1997-2001 a population survey was carried out amongst Greenland Inuit living in Denmark and West Greenland (Nuuk, Sisimiut, Qasigiannguit and four villages in Uummannaq municipality). Data collection comprised an interview, a questionnaire, clinical examinations and sampling of biological specimens (blood, urine, subcutaneous fat tissue). The clinical examinations included anthropometric measurements, an oral glucose tolerance test, ECG, ultrasound of thyroid gland and carotid arteries, a skin prick test, and lung function.

The data collection areas in Greenland ranged from the westernized capital of Nuuk (pop. app. 13,000) to small fishing and hunting villages (pop. app. 250). A total of 4,162 persons aged 18+ participated in the study; clinical examinations were performed on 2,056 of these, 739 from Denmark and 1317 from Greenland. Some of the above mentioned procedures were performed on a subset of the participants. The participation rate was 62%.

We provide an overview of the background of the study and a detailed description of the methods employed for the data collection. A set of standard tables are provided for the indigenous population of Greenland. These cover statistics for selected variables by gender and ten-year age groups.

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A GENERAL DESCRIPTION OF THE STUDY

INTRODUCTION

The present volume is a basic description of a large epidemiological study in Greenland and Denmark. In the course of the planning and data collection much valuable experience has been gathered that might prove useful for researchers planning epidemiological studies among the Inuit or similar population groups. The report is divided into three parts:

Part I	A general description of the study.
Part II	Descriptions of sub-studies and methods for data collection.
Part III	Tables of selected variables by age and gender (Greenland only).

The study was conceived in 1996, first as a study of chronic lung disease and alcohol use among the Inuit migrants in Denmark, but its scope was soon expanded to include also a follow-up of the 1993-94 General Health Interview Survey in Greenland and several nested methodological studies of health interviews, as well as specific studies of cardiovascular disease, diabetes, and thyroid diseases. Furthermore, the study was expanded to include Inuit living in Greenland. The consequences of the gradual development of the study were that the data collection took place in slightly different ways in each community. The major difference was between the data collected in Denmark and in Greenland.

The study was approved by the ethical review committee for Greenland (the Commission for Scientific Research in Greenland) and the Ethical Review Committee for Copenhagen and Frederiksberg. All subjects had been informed about the study in writing and orally, and had given their informed consent in writing prior to enrolment.

1. Design

The overall aim of the project was to study health and disease among Greenlanders living under different living conditions ranging from the traditional life in the villages of northwest Greenland to the European life in Denmark. The basic design of the study is a cross-sectional study of randomly selected Inuit from Denmark and four areas in West Greenland with a view to perform a follow-up after a suitable period of time. The data were collected by face-to-face interviews, self-administered questionnaires, clinical examinations, anthropometric measurements, and sampling of biological specimens (blood, urine, and fat biopsies).

The data collection served as an umbrella for several studies each with its own focus as described in more detail in Part II (figure 1). The data include a set of background variables for all the sub-studies (for instance age, gender, marital status, education) and variables used in only one or perhaps a couple of the sub-studies (ECG, lung function, height and weight, and ultrasonography).

The five localities where data collection took place were Denmark, Nuuk, Sisimiut, Qasigiannguit, and four villages in Uummannaq municipality (Ikerasak, Saattut, Qaarsut, and Ukkussissat). The study areas are shown in figures 2-6. Living conditions vary considerably among the study areas from the European conditions in Denmark to the traditional Inuit living conditions in the villages in Uummannaq district. Nuuk is the capital of Greenland with a population of app. 13,000. The life style is westernised but traditional Greenlandic food makes up a significant proportion of the diet and hunting and fishing are important leisure time activities. Sisimiut is the second largest

1. Follow-up of the 1993-94 Health Interview Survey in Greenland
2. Methodological study
3. Cardiovascular disease and diabetes
4. Respiratory symptoms and allergy
5. Alcohol and liver disease
6. Iodine intake, goitre and thyroid function

Figure 1. The study comprised six substudies.

town in Greenland with a population of over 5,000. The life style is much like in Nuuk but hunting and fishing play a greater role. Qasigiannguit is a small town with less than 1,500 inhabitants. The life style is intermediate; the staple diet is locally caught fish, sea mammals, and birds but a relatively well equipped shop carries western food items including fruit, vegetables, dairy products, and meat. Hunting and fishing is an important trade along with manual jobs in the fish processing industry and clerical jobs in the municipality and private companies. The four villages in Uummannaq have a total population of app. 1,000. The main subsistence is hunting and fishing.

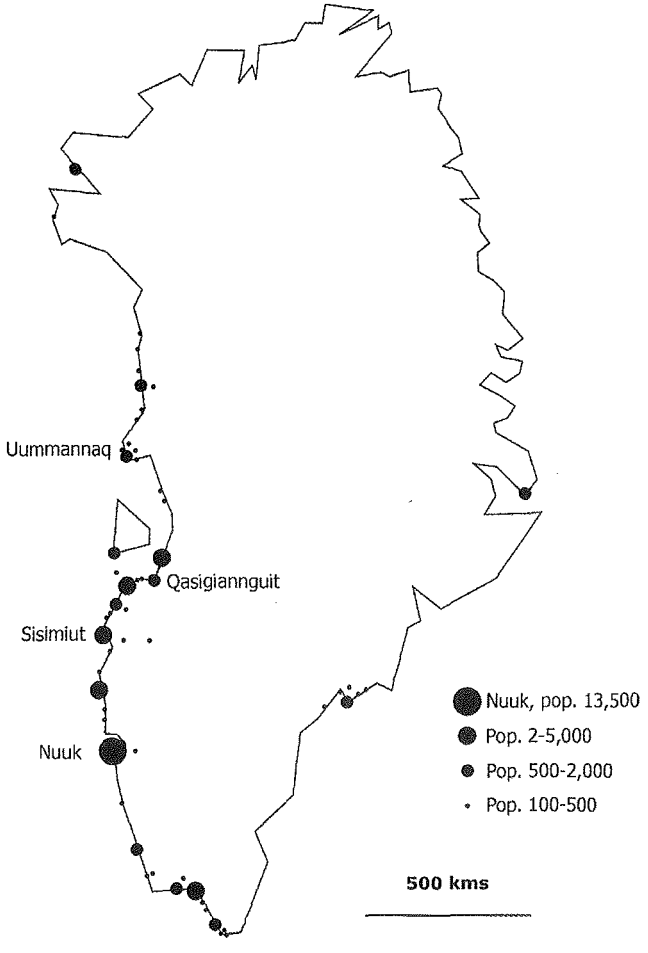

Figure 2. Map of Greenland with towns, villages and names of study areas.

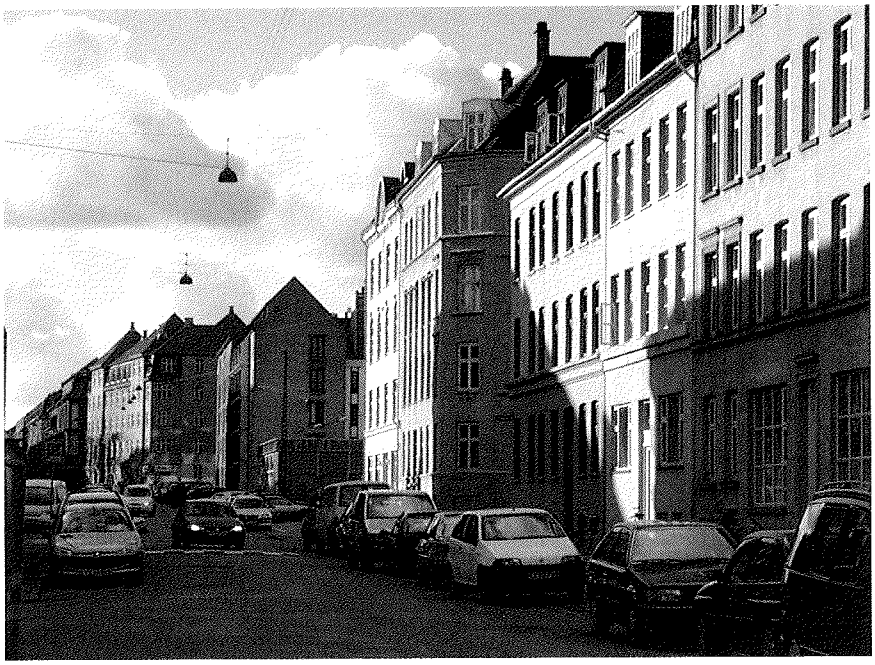

Figure 3. Copenhagen

Figure 4. Nuuk

Figure 5. Qasigiannguit

Figure 6. Ikerasak

2. Population

In Greenland, persons who identify as Inuit call themselves kalaallit (sing. kalaaleq), in English Greenlanders. The population of Greenland was 56,087 in 1999 of which an estimated 90 percent were ethnic Greenlanders. 92% of the population lives on the west coast between 60° and 75° northern latitude, the rest in the far north and on the southern east coast. Further, an estimated 6,500 ethnic Greenlanders live in Denmark permanently or for shorter periods, for example for educational purposes. The inclusion criteria for the study was age 18 or above and Greenlandic ethnicity, defined as Greenlandic or mixed Greenlandic-Danish self-identification or at least one Greenlandic grandparent or – if information on the grandparents was missing – at least one Greenlandic parent. The participants included de facto residents of the selected towns and villages. Accordingly, long term visitors were included while those who were away for longer periods were excluded from the population base, irrespective of whether or not they had informed the authorities about their moving.

In Denmark, a two-stage procedure was used to identify the Greenlanders (figure 7a). First, persons born in Greenland were identified from the Central Population Register (N=8,703). In order to approximate the age composition in Greenland, a sample of these were drawn consisting of a random sample (55%) of those aged 18-44 years and everybody aged 45 and above (N=5,646). After the exclusion of deceased persons and persons who had moved out of the study area, the sample size was 5,318. A questionnaire was mailed to the sample and information on ethnicity was obtained from 77%. A total of 3,513 (66% of the sample) were identified as Greenlanders according to the above mentioned criteria.

A completed questionnaire was received from 2,108 of those identified as Greenlanders (60%). The questionnaire was mailed to the sample in November 1997, and in January and April 1998 questionnaires were sent again to those who had not responded. Subsequently, a random sample of the participants (N=1,358) was invited to participate in the clinical part of the study, which took place from August 1998 to August 1999. A total of 739 participated in this part of the study (54%).

The study areas in Greenland were selected for theoretic as well as pragmatic reasons. Because the aim of the project was to study the

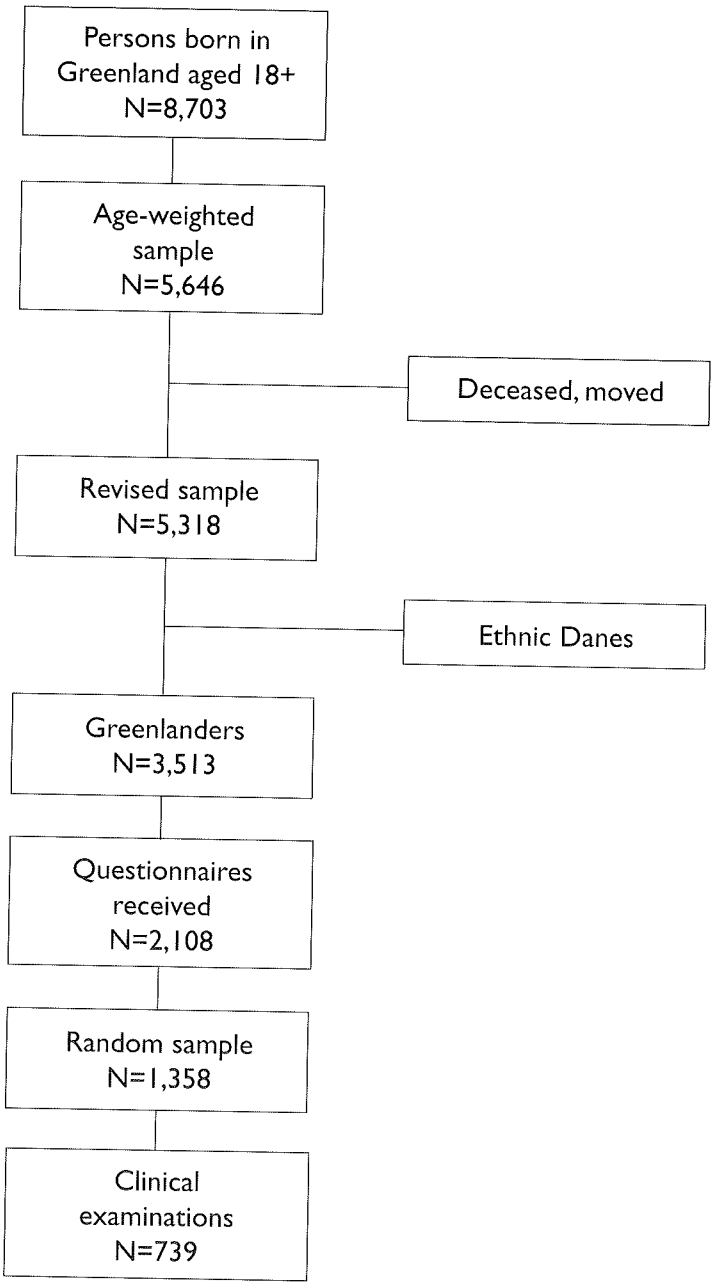

Figure 7a. Study design in Denmark.

impact of modernization on health and disease, the capital (Nuuk) was included in the study to represent the most European living conditions in the country, along with a number of villages representing the opposite end of the scale. As representatives of intermediate living conditions, one large and one small town were selected. East and North Greenland were excluded from the study for logistic reasons and because the populations differ genetically from the majority of the Greenlanders in West Greenland. The specific choice of Sisimiut as a large town, Qasigiannguit as a small town, and Uummannaq for the villages was based on our previous co-operation with the health services of those districts.

In Nuuk and Sisimiut, random samples of persons born in Greenland were invited to participate (figure 7b). These were almost all Greenlanders according to our criteria as mentioned above. The sample consisted of those who had been randomly selected for a Health Interview Survey in 1993 (N=541), a random sample drawn from the population register (N=972), and persons identified from a random sample of households (N=399).

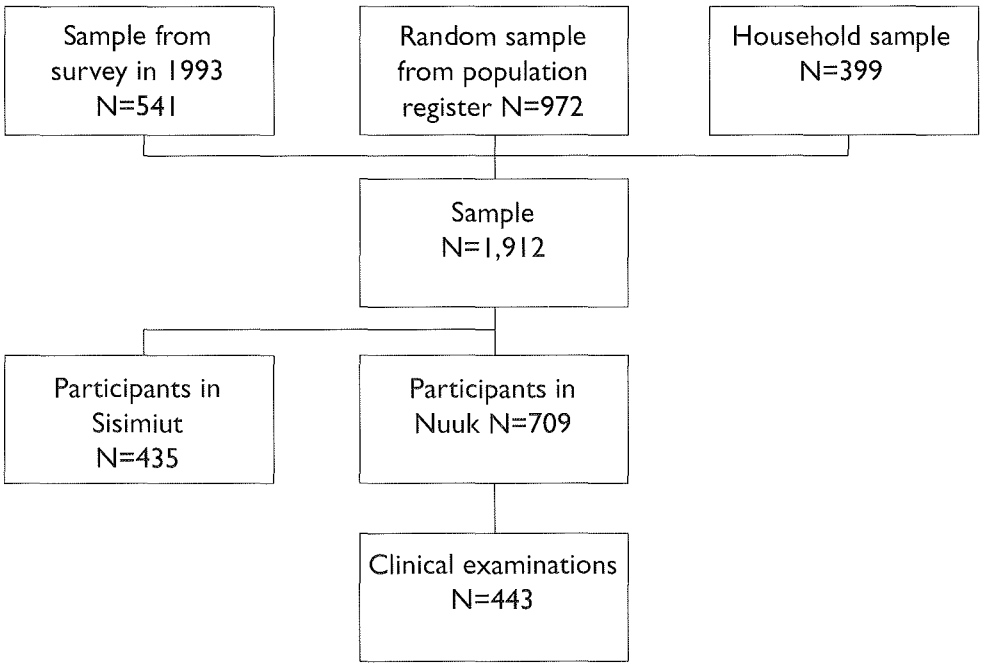

Figure 7b. Study design in Nuuk and Sisimiut.

The initial collection of data on background variables and general health was carried out by mailed questionnaires or interviews. The reason for choosing two different procedures as well as one of the reasons for the complicated sampling procedure was to study the association of these factors with the response rate and the completeness of the data. A total of 1,144 participants provided the basic information (60%). This part of the data collection took place between November 1998 and July 1999. In Nuuk, all those who had completed the questionnaire or had been interviewed (N=709), were invited to participate in the clinical part of the study, which took place from March to June 1999. A total of 443 participated (62%). The clinical phase was not implemented in Sisimiut.

In Qasigiannguit, all Greenlandic residents of the town were invited to participate in the study (N=842) (figure 7c). The potential participants were identified from the population register supplemented by the files of the hospital. Interviews and clinical examinations took place on the same day. Those aged 40 and above were studied in March-April 2000, while those aged 18-39 were studied in February-March 2001. A total of 618 participated (73%).

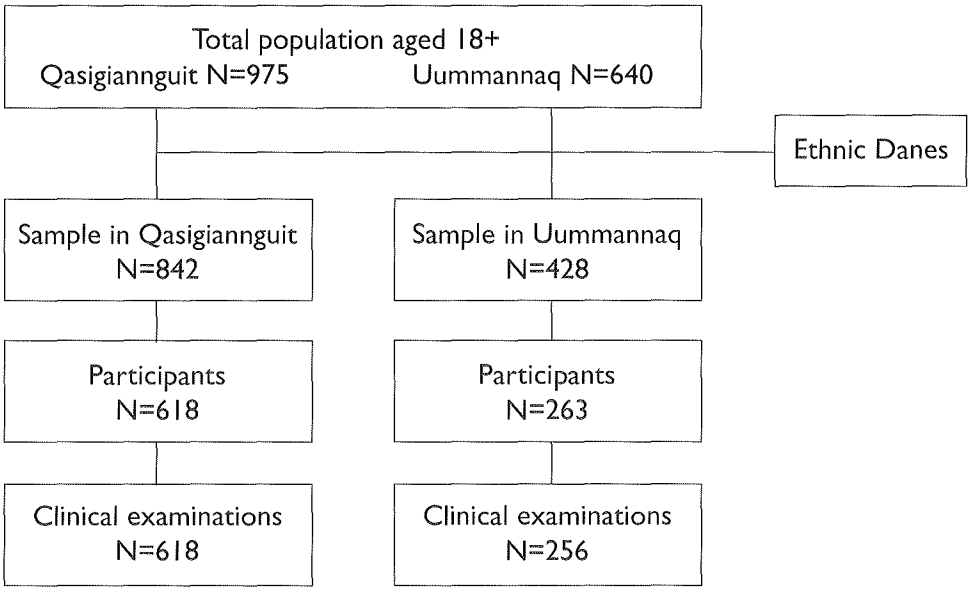

Figure 7c. Study design in Qasigiannguit and four villages of Uummannaq.

In Uummannaq, the four selected villages were visited by boat in July and August 1999. Residents, who were present during the week-long stay of the investigation teams, were invited to participate first in an interview then a day or two later in the clinical examination. The eligible population was identified by systematic house-to-house visits (N=428). A total of 263 persons participated (61%) but unfortunately a significant number of those who participated in the clinical examination were not interviewed (N=64).

In the five study areas together a total of 4,162 persons participated in the study (table 1). The sample size for the interview survey was 6,695 of which 4,069 participated (61%). The sample size for the clinical survey was 3,337 of which 2,056 participated (62%). Among the latter, 1,963 (59%) had also completed the interview part while 93 had not. These were 25 persons from Denmark, 4 from Nuuk, and 64 from Uummannaq who by mistake had not been interviewed. The participation rate in the interview survey ranged from as low as 46% in Uummannaq to 73% in Qasigiannguit while that of the clinical study ranged from 54% in Denmark to 73% in Qasigiannguit. The participation rate of women was higher than that of men; 64% for both interviews and clinical examination for women compared with 55% and 58% for men ($p<0.001$) but participation varied according to age (figure 8). Women participated more often than men until the age of 50 but their participation rate decreased steadily throughout the age span while that of men remained relatively stable until the age of 70. From this age, there was a clear decrease for both genders. The age and gender patterns were similar in all study areas.

Table 1. Sample and participation rate according to study area. Health examination survey in Greenland and Denmark, 1997-2001

	Interview survey		Clinical study		Total	Participation rate	
Study Area	Sample	Interview/ questionnaires	Sample	Clinical examinations		Interview survey	Clinical study
Denmark	3,513	2,108	1,358	739	2,133	60.0%	54.4%
Nuuk	1,084	709	709	443	713	65.4%	62.5%
Sisimiut	828	435	n/a	n/a	435	52.5%	-
Qasigiannguit	842	618	842	618	618	73.4%	73.4%
Uummannaq*	428	199	428	256	263	45.6%	59.8%
Total	6,695	4,069	3.337	2,056	4,162	60.8%	61.6%

* four villages

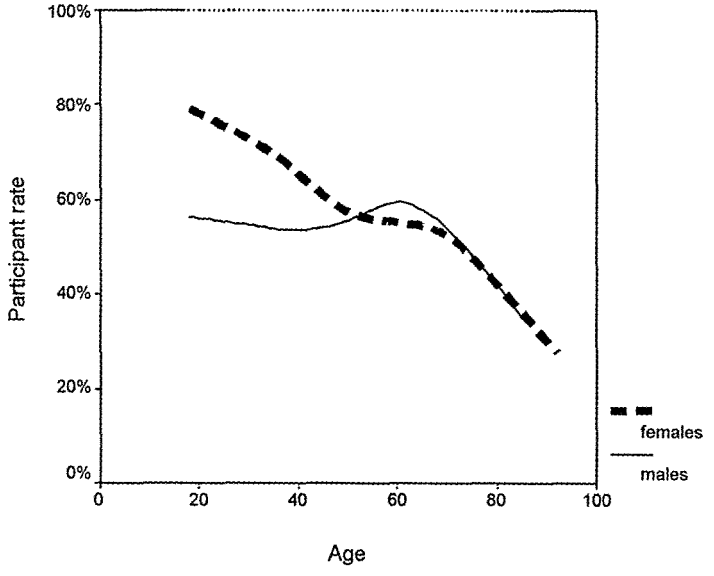

Figure 8. Participation rate by age and gender in Denmark and Greenland.

The participation rates varied according to the data collection method (table 2). As expected, the mailed questionnaires gave the lowest response rate, less than 50% in Greenland. Interviewing according to a list of individuals obtained from the central person register resulted in a reasonably high participation rate (67%) while the hospital based sampling in Qasigiannguit gave a satisfactory result (73%). Interview according to household visits gave a high participation rate in Nuuk but the validity of the enumeration of the households was uncertain and the sample population therefore not well defined. However, the

Table 2. Partcipation rate according to data collection method. Health examination survey in Greenland and Denmark, 1997-2001.

Method	Study areas	Participation in interview survey	Participation in clinical study
Mailed questionnaires	Denmark	60.0%	54.4%
	Nuuk and Sisimiut	47.5%	70.6%
Interview according to individual list	Nuuk and Sisimiut	66.7%	65.5%
Interview according to household visits	Nuuk and Sisimiut	80.5%	50.7%
	Uummannaq*	46.5%	59.8%
Hospital based sampling	Qasigiannguit	73.4%	73.4%

* four villages

return in the form of completed questionnaires per interviewer hour was higher by this method than when interviewing from a list of individuals, many of whom were not at home when the interviewers tried to contact them. The participation rates are not high by European or North American standards but similar rates have been obtained in comparable studies from other Inuit populations: 51% in Alaska in 1994, 54% in Nunavik, Canada, in 1992, and 73% in Kivalliq, Canada, in 1990 (Ebbesson et al. 1998; Jetté 1994; Moffatt et al. 1993).

3. Data collection

Data collection started in Denmark in November, 1997, when the first questionnaires were mailed. Clinical examinations in Denmark took place in 1998 and 1999. In Nuuk, Sisimiut, and Uummannaq, data collection took place in 1999, and in Qasigiannguit in 2000 and 2001. A number of different data collection methods were applied. In Denmark, and partly in Nuuk and Sisimiut, questionnaires were mailed to the sample. In all the study areas in Greenland, and exclusively so in Qasigiannguit and Uummannaq, participants were interviewed by trained interviewers as well as given a self-administered questionnaire with questions on sensitive matters, for instance mental health and use of alcohol. The interviews took place in the participants' homes (Nuuk, Sisimiut), at the local hospital (Qasigiannguit) or at the local health station or school (in the villages). Additional questions were asked by interviewers during the clinical examinations. The questionnaires were available in Greenlandic and Danish and the interviews were conducted in the language of the participants' choice. In Denmark, almost all questionnaires were filled in in Danish, while in Greenland, almost all questionnaires and interviews were in Greenlandic. Table 3 gives an overview of the data collection.

The clinical examinations consisted of sampling of (fasting) blood and urine, an oral glucose tolerance test with 2 hour blood sampling, a subcutaneous fat tissue biopsy, anthropometric measurements, blood pressure, ECG, a general physical examination for signs of alcohol related disease, skin prick test, lung function test, and ultrasound of the thyroid gland and carotid artery. The examinations applied varied according to the study area and the age of the participants (table 4).

The clinical examinations were performed by a team of investigators consisting of trained staff from Denmark and staff from the local hos-

pitals trained on the job. The data collection was arranged by stations between which the participants rotated. As an example, the stations used in Qasigiannguit are shown in figure 9. In all study areas, the clinical examination took place in localities assigned to the project by the local hospital, in the villages, however, in schools or health centres.

Table 3. Data collection methods.

Method	Denmark	Nuuk	Sisimiut	Qasigiannguit	Uummannaq*
Year	1997-1999	1998-1999	1999	Interview	Interview
Method	questionnaire	Interview/ questionnaire	Interview/ questionnaire	Hospital	Home, health clinic
Place of interview	n/a	Home	Hospital		
Time from interview to clinical examination	12 months	65 days	n/a	0	1 day
Median and range	(4-18)	(7-188)			(0-6)
Language (percent interviewed in Danish)	100%	3.8%	1.8% 2000-2001	2.8% 1999	0

* four villages

Table 4. Data collection according to study area. Age group in which the particular data was collected.

Method	Denmark	Nuuk	Sisimiut	Qasigiannguit	Uummannaq*
Interview and questionnaire	18+	18+	18+	18+	18+
Non-fasting blood and urine samples	18+	18-24	-	18-24	18-24
Fasting blood and urinen samples	-	25+	-	25+	25+
Oral glucose tolerance test	-	35+	-	35+	35+
Fat biopsy	18+	18+	-	-	18+
ECG	18+	18+	-	18+	18+
Lugn function with metacholin provocation	18+	18+	-	18+	18+
Reversibility test	18+	18-34	-	18-29	18-34
Skin prick test	18+	18-54	-	18-29	18-54
Anthropometric measurements, blood pressure	18+	18+	-	18+	18+
Ultrasound of thyroid gland and carotic arteries	18+	18+	-	-	-

* four villages

Station 1.	Welcome and information about the study; signing of consent form.
Station 2.	Blood sampling and ingestion of glucose.
Station 3.	Interview and blood pressure.
Station 4.	Physical measurements; ECG.
Station 2.	Return to station 2. Two hour blood samples.
Station 5.	Lung function.

Figure 9. In Qasigiannguit, the participants rotated among five stations. In Copenhagen and Nuuk a station with ultrasound was added.

The methods for data collection gradually changed during the life span of the project. The most efficient arrangements were used in Qasigiannguit, where a team of seven investigators managed to examine on average 12.9 participants a day. Based on our experience, the most crucial factors for a high response rate and good data were a one-step data collection procedure (i.e. interviews and clinical examinations on the same day), a not too extensive examination programme, a close co-operation with the local health services, and the continued presence of a senior investigator.

4. Data management

The questionnaire data from Denmark were manually coded and data were entered directly in SPSS Data Entry. All other data from the questionnaires and the clinical recording sheets were manually double entered on the computer by a commercial data entry company. Answers to open ended questions were recorded in Danish or translated before data entry. A data entry base was constructed in Access and the data was subsequently converted into SPSS. The database contained a custom built coding facility. Results from laboratory analyses were transferred directly from the recording system of the laboratories to computer files. The in-house management of the data consisted of the merging of registry files and data files, and a control for values outside the permitted or expected range against the original data sheets. This was done in SAS and for the end users the data files were converted into SPSS v. 11.0. Further control of data was performed successively in relation to the use of specific variables. The final data set contains 4,162 cases and 780 variables.

5. Information to participants and communities about the results

For a number of the measurements, the interpretation of the results is sufficiently clear to allow a classification into normal and pathological cases. These included blood pressure, oral glucose test, total cholesterol and liver biochemistry. All participants in Denmark, Nuuk, and Uummannaq were informed about pathological results by individual letters in which a medical check-up was recommended. After obtaining written permission from the participants, the local hospitals in Greenland were also informed about the results. In Qasigiannguit, all participants with pathological results were invited to a check-up at the hospital.

The definition of normal and pathological results was complicated by the fact that the participants represented a basically healthy population – a common complication in population-based research – and the fact that tables of normal biochemical values for Greenlanders do not exist. For some of the variables, had we used the Danish normal values, an unrealistically high proportion of the Greenlanders would have had pathological results. In these cases the threshold for action was increased. Table 5 shows the levels of action for the selected variables and the number of participants who were referred. Participants with hybertension or abnormal ECG readings and participants with newly diagnosed diabetes were informed and referred to the local health service.

Table 5. Reference intervals and levels of action for selected variables. Reference values for the general population in Denmark according to the respective analytical laboratories. Action level and number above the level among participants in greenland.

Variable	Reference interval	Action level	Number and percent above the action level	
			No.	%
Blood pressure	≥ 140/90	140/90	217	16,7
Total cholesterol	Men 4,0-7,7 mmol/l Women 4,0-7,3 mmol/l	Men 7,7 mmol/l Women 7,3 mmol/l	108	8,2
Albumin	39,6-51,1 g/l	<37 g/l	30	2,3
ASAT	Men <50 U/l Women <35 U/l	Men 100 U/l Women 70 U/l	31	2,4
Alkaline phosphatase	80-275 U/l	600 U/l	3	0,2
Bilirubin	4-22 micromol/l	23 micromol/l	11	0,8

6. Publication policy and authorship

A publishing committee has been established by the steering committee. Before writing an article or preparing a talk, the researchers associated with the study must submit a proposal and obtain approval from the committee. The name of the last author must always be followed by "... and The Greenlandic Population Study" followed by the names of those currently on the steering group and the institution that houses the secretariat. The secretariat is informed when manuscripts are submitted for publication and when they are accepted.

Each individual project has signed an agreement of co-operation that stipulates the responsibilities of the primary investigator of the project and that of the primary investigator for the whole study regarding use of data, financial matters, and publications. A yearly report is submitted by each individual project.

7. Ancillary studies policy

The data collected including stored biological material may be used for research that was not originally planned. Researchers are welcome to submit their proposals to the steering committee. Permission to use the data will normally be granted providing the proposal is not in conflict with existing research plans. The study protocols must be approved by the relevant ethics review committee and the applicants must bear all the costs related to the retrieval of data and biological material. In addition, a fee is charged towards the maintenance of the project database.

All data generated by additional analyses of existing data or biological material must be supplied to the general database.

DESCRIPTION OF SUB-STUDIES AND METHODS FOR DATA COLLECTION

SUB-STUDIES

1. Follow-up of the 1993-94 Health Interview Survey in Greenland

The aim of the study was to analyse the development of self-reported health and disease, and life style from 1993-94 to 1999-2001.

Background

In 1993-94, information was collected about health, life style and living conditions from a random sample of 1,728 adults from Greenland. The sample was countrywide and comprised both Greenlanders and Danes. This survey was the first countrywide health survey from Greenland. The database included among other things information about self-rated health, self reported morbidity, diet, physical activity, and use of tobacco and alcohol. A sub sample of participants from the central west coast (n=264) participated in a clinical study of cardiovascular disease.

In order to make the survey from 1993-94 and the present survey comparable, a subset of participants is drawn from the two datasets. The criteria for inclusion ensure comparability regarding ethnicity, place of residence, and method of data collection. Some individuals participated in both surveys.

2. Methodological study

The aim of the study was to analyse a number of methodological issues related to data collection in Greenland:

i) the influence of sampling method on participation rate.
ii) the influence of the age and gender of the interviewers on the results
iii) the influence of the wording and answer categories on self-rated health.

iv) a qualitative evaluation of self-rating of health.
v) a pilot test of question batteries: risk perception; Sense of Coherence; SF-12.
vi) a semi-qualitative evaluation of classification of participants as hunters/fishermen.
vii) how to ask about diet in a simple way.

Background

A Health Interview Survey from 1993-94 raised a number of questions that were addressed as studies nested in the present survey. Because of the lack of professional interviewers in Greenland and because of the high costs of travel, the need for exploring less expensive methods for data collection is imperative. Self-rated health is generally a good predictor of survival but little is known about its significance or meaning in Greenland. Furthermore, analyses indicate that women interviewed by women rate their health much poorer than women interviewed by men, an observation that needed confirmation. Because the number of health surveys in Greenland is so small, a lot of work is needed to test various health scales; it was chosen to include a few of these in the questionnaires for a subset of the participants. The usual socioeconomic classification used in Denmark and other western European countries does not seem to capture the full range of social and economic status in Greenland. For instance, the position of hunters and fishermen is not clear, and the association between social status and income is not as distinct as in many western countries. Finally, an evaluation of the diet with respect to the relative consumption of traditional (marine) food versus imported (terrestrial) food is central to many studies of health and disease in Greenland.

3. Cardiovascular disease and diabetes

The aims of the study were:

i) to analyse behavioural, biological and genetic determinants for atherosclerosis and type 2 diabetes among the Greenland Inuit in relation to early disease manifestations.
ii) to analyse whether life style changes associated with modernisation and migration, in particular a reduction of physical activity and a decreased consumption of marine mammals and fish, increase the prevalence of atheroscle-

rotic disease and diabetes, and induce changes in the biochemical risk profile of the populations.

iii) to assess to what extent the increase in the prevalence of atherosclerotic disease and diabetes which has taken place recently among Alaska Natives can be expected in Greenland, and if necessary to indicate possibilities for preventive strategies.

iv) to assess the implication of the results for the global prevention of atherosclerosis.

Background

The incidence of cardiovascular disease and diabetes is low among the Inuit of Greenland compared with the western industrialised world although this presumption is partly based on outdated and conflicting evidence. Over the last decades dramatic life style changes have occurred in many indigenous populations including Greenlanders, leading to a deterioration of the cardiovascular risk profile and to a world-wide epidemic of type 2 diabetes (non-insulin dependent diabetes, NIDDM). The changes in disease pattern in aboriginal populations in Asia, the Pacific Islands, and North America are likely to have been induced by a combination of genetic susceptibility and a "westernisation" of life style.

Genetic factors are likely to play an important role in determining the observed pattern of plasma lipids and cardiovascular disease. The Inuit of Greenland are a population with a probable genetic potential for developing high incidences of cardiovascular disease and diabetes, but in contrast to populations like, e.g., the Pima Indians, the Nauruans and the Alaska Eskimos, they have retained a life style that counterbalances the genetically determined high risk for disease. It will have important consequences for future preventive strategies in Greenland and globally if a protective effect of the Greenlandic life style can be demonstrated.

For the study on cardiovascular disease and diabetes, questionnaire information was collected on heart disease, dyspnoea, blood pressure, and diabetes. Clinical examinations included anthropometric measurements, blood pressure, ECG, ultrasound of carotid arteries, and an oral glucose tolerance test. Biological samples were analysed for cholesterol fractions and triglyceride, free fatty acids, glucose, insulin, C-peptide, and HbA1c, and DNA was prepared for genetic analyses.

4. Respiratory symptoms and allergy

The aims of the study were:

- to study the prevalence of asthma, allergy and chronic bronchitis among Greenlanders living in Greenland and Denmark and compare this with the general population in Denmark.
- to evaluate the importance of factors such as tobacco, pets, and diet for the development of respiratory symptoms and allergy.
- to evaluate the influence of genetic background and environment on the development of respiratory symptoms.
- to construct a reference distribution of FEV1 and FVC for Greenlanders.
- to examine the distribution of sensitization to aeroallergens (i.e. positive allergy skin prick test).
- to examine the distribution of bronchial responsiveness to inhaled methacholine.

Background

Asthma is a world-wide problem and there is convincing evidence from a number of epidemiological studies that the prevalence of atopic dermatitis, allergic rhinitis and asthma has increased since World War II. Furthermore, respiratory diseases including both asthma and bronchitis are the most frequently found illnesses among adults. Many studies from around the globe show similar trends. A number of possible causes have been proposed, but the full explanation still remains obscure and factors associated with such an increase are not fully understood.

Climatic conditions, living conditions, tobacco consumption, allergen exposure, severe infection during childhood, and diet habits might be some of these factors. Increased awareness of allergic symptoms could influence the outcome of questionnaire based population studies, although this does not explain the reported increase in prevalence of atopy shown by skin prick testing. Greater mite infestation in Scandinavian houses, due to high humidity caused by improved insulation and thereby reduced ventilation, has been correlated with increased mite allergy and hence allergic asthma (Korsgaard 1998, Korsgaard 1983, Lau et al. 2000). A similar change in housing conditions has occurred in Greenland too. Furthermore, during the last century, the introduction of furred pets into homes has led to an increase in

sensitization to pet dander, which also seems to increase the prevalence of asthma among subjects with atopic disposition, whereas this would probably decrease the frequency of allergy among non-atopics due to the hygiene hypotheses. Lastly, the importance of tobacco consumption is also an issue in the development of respiratory illness.

5. Alcohol and liver disease

The aims of the study were:

- to study the prevalence of alcohol dependence and harmful use of alcohol among Inuit in Greenland and Denmark.
- to study the prevalence of viral hepatitis among Inuit in Greenland and Denmark.
- to study the prevalence of clinical and biochemical signs of liver disease in Inuit in Greenland and Denmark.
- to study the relation between alcohol consumption and signs of liver dysfunction in Inuit and to identify additional risk factors/ confounders for this relation.
- to study the relation between life style changes, migration, living conditions, and alcohol habits.
- to initiate a prospective cohort study facilitating later follow-up studies especially on alcohol related mortality and morbidity.

Background

Alcohol intake in Greenland has been a considerable health problem for many years. In 1983 the average alcohol consumption was 22 litres of pure alcohol per inhabitant aged 15 years or more. In 1992 the local government in Greenland passed a new alcohol legislation, but already before these laws were passed the alcohol consumption had decreased and by 1994 the alcohol consumption was reduced to 13.2 litres of pure alcohol per inhabitant aged 15 years or more.

In Greenland the most common adverse consequences of alcohol are accidents, violence, homicides and suicides. The prevalence of the classic alcohol related diseases as for example chronic liver disease or chronic pancreatitis is probably low in spite of a high alcohol consumption and a medium high prevalence of hepatitis B. In a small autopsy study no cases of cirrhosis were found. The pathogenesis underlying the low prevalence of chronic liver diseases in Inuit in Greenland is unknown.

Apart from the above, the prevalence of numerous diseases differs between Danes and Inuit. For example, abdominal hernias as well as congenital heart disease are very prevalent in Inuit. Furthermore, mortality from cerebrovascular bleeding is significantly higher among Inuit.

Many risk factors and modifying factors for the development of these diseases are unknown. In order to elucidate the pathogenesis of chronic liver disease and alcoholic liver disease in particular, information based on standardized self-administered questionnaires and interviews were collected on alcohol habits and diet. The clinical examination included anthropometric measurements and systematic registration of clinical signs of chronic liver disease. Blood samples were analysed for standard biochemical liver function tests (aspartate aminotransferase, alkaline phosphatase, albumin, and bilirubin). Blood samples were collected and stored for later analyses of hepatitis serology and markers of fibrosis such as YKL-40, hyaluronan and procollagen-III aminoterminal peptide (P-III-P). Furthermore DNA was prepared for later genetic analysis, and subcutaneous fat biopsies were sampled to be analysed for lipids as a measure of dietary intake of fat.

6. Iodine intake, goitre and thyroid function

The aims of the study were:

- to obtain information on the iodine intake level among Inuit in Denmark and West Greenland.
- to obtain data on the frequency of some common clinical manifestations of thyroid disorders.
- to obtain data on the occurrence of overt and subclinical thyroid disorders among Inuit in Denmark and West Greenland.
- to obtain data on thyroid volume and structure among Inuit.
- to evaluate the associastion between dietary components and life style descriptives and iodine intake and thyroid disorders.
- to assess the possible need for iodine supplementation or monitoring of the iodine intake level in Greenland.

Background

Thyroid disorders are among the most prevalent medical conditions globally and their occurrence is highly dependent on the availability of iodine. The type of thyroid disorder varies with the iodine intake

level and other environmental factors and probably genetics also. Abnormalities in thyroid function may lead to a variety of disorders (atherosclerosis, heart rhythm disturbances, osteoporosis, mood disturbances).

Little is known about the iodine intake and the prevalence of thyroid abnormalities in Greenland. In 1940 Bertelsen reported the absence of endemic goitre and cretinism among Inuit in Greenland and speculated that this was caused by a sufficient iodine intake supplied by the marine diet. In keeping with the report by Bertelsen, a number of studies from different regions in Greenland have been without reports of thyroid abnormalities.

The circumpolar Inuit are in a transitional state with profound alterations in life style factors. This includes dietary habits and may consequently influence the iodine intake level. Also, a genetic admixture has been taking place. These factors may contribute to a change in the occurrence of thyroid disorders. Recently a report from Queen Ingrid's Hospital in Nuuk suggested an increase in thyroid abnormalities among Inuit in Greenland. This emphasises the need for more systematic studies of iodine intake and thyroid disorders in Greenland.

METHODS FOR DATA COLLECTION

1. Questionnaire

Much of the information was obtained through structured questionnaires, which were filled in either by the respondents themselves or by interviewers. Basically, background information was either obtained by interview or self-administered questionnaire, while information on certain sensitive items such as alcohol use and mental health was obtained through a self-administered questionnaire. Information on specific diseases was obtained through a clinical interview performed by a health professional.

The questionnaires comprised questions on sociocultural background variables and self-reported disease as well as questions on specific diseases or exposures. The questionnaires included questions used in previous surveys in Greenland, translations of internationally used questions and scales, and a few questions used for the first time. Questions that had not been used in the Greenlandic language before were translated from Danish to Greenlandic separately by at least two interpreters and back translated by a third interpreter. The original and the translated version in Danish were compared and discrepancies were discussed among the three interpreters and the principal investigators. Some of the questions are described below in alphabetical order.

Alcohol

In order to obtain a quantitative estimate of the individual alcohol intake the participants were asked: *How many units of beer, wine and spirits do you drink per week on average?* (1 bottle of beer = 1 unit; 1 bottle of strong beer = 2 units; 1 glass of wine = 1 unit; 1 bottle of wine = 6 units; 1 glass of port or similar = 1 unit; 1 bottle of port or similar = 10 units; 1 glass of spirits = 1 unit; 1 bottle of spirits = 30 units). A Danish unit of 12 g alcohol corresponds to one beer, one glass of table wine or three cl. of 40% proof spirit. If the participants drank wine they were asked for preference of red or white wine.

This quantitative measure of alcohol intake has been proven to have significant predictive value in prospective studies (Grønbæk et al. 1995, Becker et al. 1996).

Brief MAST

The Michigan Alcoholism Screening Test (MAST) is one of the most widely used measures of assessing alcohol abuse and can be self-administered or administered by means of interview without training. The original MAST test contained 25 items (Selzer 1971). Many shorter versions of the MAST test have been developed and from these we used the 10-item Brief MAST (Pokorny et al. 1972). In order to avoid inflated scores the questions were modified according to Martin et al. (1990).

The Brief MAST contained the following questions (scores in brackets):

- *Do you feel you are a normal drinker?* (yes=0; no=2)
- *Do friends or relatives think you are a normal drinker?* (yes=0; no=2)
- *Have you ever attended a meeting of Alcoholics Anonymous or similar because of your own problem drinking?* (yes=5; no=0)
- *Have you ever lost friends or girlfriends/boyfriends because of drinking?* (yes=2; no=0)
- *Have you ever gotten into trouble at work because of drinking?* (yes=2; no=0)
- *Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?* (yes=2; no=0)
- *Have you ever had delirium tremens (DTs), severe shaking, heard voices or seen things that weren't there after heavy drinking?* (yes=2; no=0)
- *Have you ever gone to anyone for help about your drinking?* (yes=5; no=0)
- *Have you ever been in a hospital because of drinking?* (yes=5; no=0)
- *Have you ever been arrested for drunk driving or driving after drinking?* (yes=2; no=0)

Individual scores were added and a cumulated score of 6 or more defined a positive test result.

Brief MAST and CAGE screening tests have been validated and compared numerous times for example by MacKenzie et al. (1996).

Modified CAGE questionnaire

The CAGE questionnaire is a short four-item questionnaire to detect alcoholism (Mayfield et al. 1974). The original CAGE questionnaire, however has not worked optimally in a Danish population and the questions have therefore been modified to include the following six questions:

- *Have you, within the last year, felt you should cut down on your drinking?* (yes; no)
- *Have people, within the last year, annoyed you by criticizing your drinking?* (yes; no)
- *Have you, within the last year, felt bad or guilty about your drinking?* (yes; no)
- *Have you, within the last year, had a drink first thing in the morning to steady your nerves or get rid of a hangover (eye opener)?* (yes; no)
- *Do you drink alcohol outside mealtimes on weekdays?* (yes; no)
- *How many days a week do you drink alcohol?* (0 to 7 days)

Two positive answers in questions 1 to 5 or one positive answer in question 1 to 5 plus alcohol drinking more than 3 days per week (question 6) define a positive test result in this alcohol-screening test. The test has been validated in hospital patients (Zierau F, Becker U, personal communication, 1999).

Additional alcohol questions

Serving as measures of internal validity and in order to be able to compare with previous studies in Greenland a number of additional self-administered questions on alcohol habits were included:

- *How often do you drink beer, wine or spirits?*
- *How often does your spouse drink beer, wine or spirits?*
- *Has any of your next of kin had problems because of alcohol?*
- *Were there alcohol problems in your home as a child?*
- *When did you last have a beer, a glass of wine or a glass of spirits?*
- *How much did you drink on that occasion?*
- *Compared with 10 years ago, how much do drink now?*
- *Have you experienced one of the following situations within the last 12 months because of your own alcohol intake or because of alcohol intake by your next of kin (spouse, children or parents)? (domestic quarrel; health problems; lack of money; lost your job; injured yourself or others because of an accident; injured yourself or others because of fighting; difficulties in being on time at your job; reporting ill).*

Asthma, allergy and bronchitis

All participants filled in a written questionnaire concerning respiratory and allergic symptoms related to themselves and their parents. Moreover, their present living conditions, indoor climate, current and former smoking habits of the subject and parents, and whether pets were held indoor were registered.

The questionnaire concerning respiratory symptoms and the definition of asthma were adopted from studies by the American Thoracic Society, Division of Lung Disease of the National Heart, Lung and Blood Institute (US Dept. of Health 1971, Ferris 1978; Hopp et al. 1984). Asthma was defined by questionnaire criteria on the basis of the responses to the following questions:

0. Has a doctor told you that you have asthma (doctors diagnose of asthma)?
1. Have you ever had asthma?
2. Does your breathing ever sound wheezy or whistling?
3. Do you have attacks of shortness of breath with wheezing?
4. Do you experience wheezing, chest tightness, cough, and breathlessness in any of the following situations: at rest, with exertion, with emotional stress, with exposure to cold air, with chest infections or head cold?
5. Do you experience wheezing after exposure to: dust, fumes, mould, pollen, food, pets or drugs?
6. Have you ever had attacks of wheezing, shortness of breath or dry cough at night?
7. Have you ever been hospitalised or observed and treated by a doctor for asthma?
8. Have you ever received medication for your asthma?
9. What was the medication used?
10. Did it help?
11. How old were you at your first asthma attack?
12. How many episodes of wheezing have you had during the last year?
13. How old were you at your last asthma attack?

Asthma was defined on the basis of positive responses to questions 2, and 3, and 4, and/or 5 or in case of a shortened questionnaire only "doctors diagnose of asthma". Current asthma was defined as symptoms within the preceding 12 months.

The questions concerning allergy, symptoms of rhinoconjuctivitis, using a questionnaire adapted from the ISAAC study (Asher et al. 1995) and allergy-related factors were as follows:

1. Have you ever experienced allergy in your nose or eyes?
2. Have you ever had atopic dermatitis?
3. Do your parents or siblings suffer from allergy?

Chronic Bronchitis (Suadicani et al. 2001) was defined by questionnaire criteria on the basis of the responses to the following questions:

1. Have you daily, or almost daily, symptoms of bronchitis?
2. Are you coughing daily?
3. Do you have phlegm – particularly in the morning?
4. Have you had coughing and phlegm in a three-month period two years in a row?

Diabetes

The two main questions concerning diabetes were: "Has a doctor ever told you that you had diabetes?" (yes, no) and "Has anyone in your family been diagnosed with diabetes?" (parents, siblings, none). If participants had been diagnosed with diabetes additional questions were asked regarding age at diagnosis, weight at diagnosis, other diseases at the time of diagnose of diabetes, treatment when diagnosed, and current treatment. A diagnosis of diabetes was based on the questionnaire, the participant replying that he or she had been diagnosed with diabetes, or on a diabetic oral glucose tolerance test (see Methods for data collection, Laboratory measurements for details). Diabetes was diagnosed according to the most recent diagnostic criteria from the WHO (World Health Organization 1999).

Diet

The central dietary question was a food frequency question that had been used in a previous health interview survey in 1993-94. This was supplemented by additional questions partly in order to explore the possibilities of a simpler classification of the population into high and low consumers of traditional Greenlandic food. The original food frequency question included six types of country food and eight types of store bought food with six frequency categories ranging from "daily" to "never". The categories of country food were seal meat, whale meat, sea birds, fish, caribou/musk-ox/hare, and mutton. Other questions explored the use of soda pop and sugar in hot beverages, and others were related to meals and the hunting for country food.

Hypertension

Participants were asked:
"Has a doctor ever told you that you had hypertension (high blood pressure?)" (yes, no) and *"Has anyone in your family suffered from hypertension (high blood pressure?)"* (parents, siblings, none). In addition to these, all participants were asked: *"have you ever had your blood pressure measured?"* (yes, no), and in case of yes: *"when was it measured?"* and *"was the blood pressure normal, too low, too high, do not know?"*. If the participant answered in the affirmative to the question about diagnosis of hypertension, he or she was also asked: *"when was it diagnosed?"*, *"how is it treated at present?"* and *"are you under continuous medical care for hypertension?"*.

In the present study, hypertension was defined as the participants answering yes to a history of hypertension or a blood pressure >= 140/90.

Mental health

Several questions were asked about mental health, including questions about current symptoms (anxiety; sleep disturbances; depression), longstanding illness (coded according to ICD 8), and questions about suicidal thoughts and attempts.

General Health Questionnaire

The General Health Questionnaire (GHQ) was originally developed as a screening tool for psychiatric illness and has been used in numerous countries for epidemiological studies. It focuses on changes in normal function during the last two weeks rather than lifelong traits (Goldberg 1972). We used the abbreviated 12-question version and scored the questions according to the "GHQ method" (Goldberg and Williams, 1988) with a subsequent categorization of individuals scoring 0 or 1 as potentially normal, and those scoring 2 and above as potential cases (GHQ-cases). Before its use, the GHQ was pilot tested in a small study among outpatients at the Primary Health Clinic and among psychiatric outpatients in Nuuk. The GHQ has been used in a previous population survey in Greenland (Bjerregaard and Curtis 2002) where validation of the scale by Chronbach's alpha showed an acceptable internal consistence (0.80). In that study, the distribution of potential cases ranged from 21% among participants with good self-rated health and who had not visited the outpatient clinic during

the last three months, to 68% among those who during the last two weeks had visited the clinic with a mental health problem (Bjerregaard et al. 1997). The GHQ has also proved to be a reliable tool in a study among primary care patients, where it has been validated against a psychiatric examination (Lynge et al. 2003).

Physical activity

Questions were asked about physical activity during summer and winter. The question ran: Which of the following describes best your physical activity during your leisure time over the past 12 months? The five response categories were:

a. *Reading, watching TV, or other sedentary activity.*
b. *Light physical exercise at least 4 hours per week, for instance walking (shopping or to work) or light domestic chores.*
c. *Occasional physical exercise for instance sports or dog sledge driving.*
d. *Regular sports or other physical exercise at least 4 hours per week.*
e. *Heavy sports several times per week.*

Rose questionnaire

The questionnaire included Danish and Greenlandic translated versions of the Rose questionnaire (Rose & Blackburn 1968). A translated and back translated Danish version of the questionnaire was used (identical to the version used in multiple large scale epidemiological surveys during the last 30 years). The Danish questionnaire was translated and back translated into Greenlandic.

Self-rated health

In English translation the question ran "How would you rate your health?" with five answer categories: Excellent, good, fair, poor, and very poor. As a part of the methodological study, two different translations of "rate" into Greenlandic were used, one which might be translated as "believe", the other as "feel". Also, two sets of answer categories were used, the one as above, the other with "very good" instead of "excellent".

Sense of coherence

The Sense of Coherence instrument (SOC) was developed by Antonovsky on the basis of a theory on health as a feeling of confidence that life is 1) comprehensible, 2) manageable and 3) meaningful (Antonovsky 1987, 1993). The 13-item version was chosen for this study. Items have answers graded from 1 to 7. Analyses were based on sums of all 13 items (Due 1998).

SF-12

SF-12 is a subset of 12 items from the Short Form –36 Health Survey (SF-36). The SF-12v.1 provides estimates to physical (PCS) and mental (MCS) summary measures (Ware et al. 1996).

Smoking

Six questions were included on smoking:

1. *Do you smoke? (yes, daily; yes, but some days I don't; no)*
2. *Did you ever smoke? (yes, stopped less than six months ago; yes, stopped longer ago; no.*
3. *How many cigarettes/cheroots/cigars/pipes do you or did you usually smoke per day?*
4. *How old were you when you started smoking?*
5. *How many people smoke in your home on an average day, including yourself?*
6. *Did people smoke in your home when you were a child?*

The duration of smoking and the daily tobacco consumption were registered, and an estimate of lifetime tobacco exposure was calculated as pack-years (current tobacco consumption [g/day]/20 * duration of smoking [years]). Passive smoke exposure during childhood and/or by a present partner was also recorded.

Thyroid and iodine intake

A questionnaire on intake of iodine from supplements was included as well as questions on thyroid related symptoms and reports of goitre and thyroid disorders in participant and in relatives.

The questions on iodine supplements were:

1a. Do you take vitamins? (No, never; Yes, sometimes; Yes, during winter; Yes, daily)

1b. If yes, do they contain iodine? (Yes; No; Don't known)

2a. Do you take other supplements regularly? (Yes; No)

2b. If yes, do they contain iodine? (Yes; No; Don't known)

3a. Have you, within the past six months, been given medicine containing iodine for an X-ray examination? (Yes; No; Don't know)

3b. If yes, what kind of examination was performed?

Thyroid disease and thyroid related symptoms

The questions on goitre, thyroid disorders, and thyroid related symptoms were

- *Have you ever noticed a goitre? (Yes; No)*
- *Has a doctor ever told you that you had hyperthyroidism? (Yes; No)*
- *Has a doctor ever told you that you had hypothyroidism? (Yes; No)*
- *Have you had any of the following symptoms within the past twelve months: hyperactivity, palpitation, increased appetite, decreased appetite, increased bowl activity, constipation, dry skin, fatigue, nervousness, mood disturbances, depression. (Yes; No).*
- *Has any of your family members had a diagnosis of one of the following diseases: hyperthyroidism, hypothyroidism, or goitre.* For each disease was given the opportunity to tick yes for father, mother and up to five siblings.

2. Clinical measurements

Airway responsiveness

Airway responsiveness to inhaled histamine was measured using the method described by Yan (Yan et al. 1983). Histamine aerosol was generated by a Morgan nebulizer® with an output of 0.015 ± 0.0005 ml/inhalation. Histamine was administered in doses ranging from 0 (saline) to 7.8 micromol. Testing was terminated when the maximum dose had been reached, or when a decrease of at least 20% of FEV1 from the post-saline value was observed. The response was measured by the FEV1 1 min after each inhalation. By the end of the provocation schedule, the dose of histamine causing a 20% fall in FEV1 (PD20) was calculated by linear interpolation from the individual dose response curve.

Histamine responsiveness was also analyzed with the use of an estimate of the overall slope of the dose-response relationship. The dose-response slope (DRS) was calculated as the decline in FEV1 from the post-saline value (expressed as a percentage of the post-saline value) after the final dose divided by the dose of histamine administered. Before logarithmic transformation a constant of 3% was added to all dose-response slopes to eliminate negative and zero values (O'Connor et al. 1987).

Allergen sampling (pollen and dust)

As a part of the study airborne pollen measurements were carried out in Nuuk during 1997-99, with a Burkard Volumetric 7-Days Spore Trap (Burkard Manufacturing Co. Ltd.). The trap was placed near Queen Ingrid's Hospital (64°10′N, 51°45′W, 19 meters above mean sea-level) at 1.5 metres above ground level. The pollen data for Copenhagen were obtained from official recordings utilising a Burkard Trap placed at the Danish Meteorological Institute (55°43′N, 12°34′E, 8 metres above mean sea-level) 15 meters above ground level. To count pollen standard methods were used (Käpyla & Penttinen 1981). Dust was collected only from the homes of subjects with allergic sensitization to house dust mites and a control group of non-allergic subjects. The participants collected dust samples at the time of the physical examination and samples were collected randomly throughout the year. In Nuuk and Uummannaq, a member of the study team visited the homes of the participants and collected dust samples using the

same two vacuum cleaners. All dust samples were collected in a new vacuum cleaner bag with separate sampling from the mattress and bedroom floor. Bags were sealed in a plastic bag and stored at room temperature until preparation. Domestic mites were counted, identified by microscopy, and recorded as number of mites per gram dust, as described by Lind et al. (1979).

Anthropometric measurements

Height and weight were measured with the participants stripped to their underwear and socks. On the standing participant, waist circumference was measured midway between the iliac crest and the costal margin, hip circumference at its maximum. Weight was measured on a standard balance beam clinical scale.

Blood pressure

Blood pressure was measured at the right arm of the sitting participant after at least five minutes of initial rest. Using a mercury sphygmomanometer with an appropriate size cuff, the blood pressure was read to the nearest mm Hg three times with at least 1 min. interval at the first and fifth Korotkoff sounds. The two last measurements were averaged for the analyses.

Clinical signs of liver disease

As part of the general health examination clinical signs of chronic liver disease were recorded i.e. jaundice, facial telangiectasia, vascular spiders, palmar erythema, white nails, ascites, abdominal wall collateral veins, fatness, and peripheral oedema. Different observers performed the clinical assessments. All observers were educated by means of photographs and written descriptions of the different clinical signs. The clinical observations may be used to diagnose cirrhosis in alcohol-abusing men with high accuracy as previously demonstrated (Hamberg et al. 1996).

Fat biopsy

A subcutaneous fat tissue biopsy was performed in one of the buttocks, pre-anaesthetized by Lidocain/Prilocaine cream (EMLA cream 5%, AstraZeneca) (Beynen & Katan 1985; Kohlmeier & Kohlmeier 1995). The subject lay face down and the biopsy was taken with a needle coupled to a vacuum tube from the upper, outer quadrant of the but-

tocks. The sample was collected in the connector between the needle and the tube, and stored at -80°C in the connector until analysis. The biopsies were used for analysis of fatty acids.

12-lead electrocardiogram

A 12-lead electrocardiogram was obtained with a NIHON COHDEN 9130 apparatus. All ECGs were coded according to Minnesota codes by the same experienced assistant.

Oral glucose tolerance test

After a minimum of 8 hours fasting all participants over 35 years without medical treatment for previously diagnosed diabetes had an oral glucose tolerance test. Plasma glucose was measured fasting. The participant received 82.5g of glucose monohydrate in 250 ml of water (equivalent to 75g of glucose). Plasma glucose was measured again after 120 min. Blood was drawn from the cubital vein, and immediately put on ice. The samples were spun at 4°C, 1,500G for 10 minutes. Plasma was separated, frozen at –20 °C and transported to one central laboratory for measurement of plasma glucose. Glucose tolerance was classified according to WHO criteria (WHO 1999). Fasting plasma glucose >=7.0 mmol/l and/or 2-h plasma glucose >=11.1 mmol/l were taken to indicate diabetes. Impaired Glucose Tolerance (IGT) was defined as fasting plasma glucose < 7.0 mmol/l and 2-h plasma glucose between 7.8 – 11.0 mmol/l and Impaired Fasting Glycaemia (IFG) was defined as fasting plasma glucose 6.1-6.9 mmol/l and 2-h plasma glucose < 7.8 mmol/l.

Pulmonary function test

The forced expiratory volume in 1 s (FEV1) and forced vital capacity (FVC) were measured with a 7-L dry wedge spirometer (Vitalograph®), which was calibrated weekly. Each measurement consisted of at least two maximal expiratory manoeuvres from total lung capacity to residual volume with a variation of FEV1 of less than 5%. The highest FEV1 and FVC were used for the analyses. The FEV1/FVC ratio was calculated, and sign of airway obstruction was defined as FEV1/FVC ratio lower than 70%. All participants had a reversibility test with inhaled beta agonist. A standard dose of bronchodilator (0.4 mg salbutamol) was given straight after the histamine challenge test, as a test (see below) for reversibility with pre-histamine test FEV1 similar to

the previously measured FEV1. Measurement of FEV1 was repeated 15 min. after administration of salbutamol, and bronchodilator reversibility was calculated as follows: (FEV1 after - FEV1 before) / FEV1 before). Bronchodilator reversibility ratio was included in the analysis as a continuous variable. A positive test was defined as an increase in FEV1 of at least 20%.

Skin prick test

Subjects were tested on the volar surface of the distal forearm, using standard dilutions (10 HEP, moulds 1:10 w/v) of allergens in 50% glycerol (ALK-Abello, Hørsholm, Denmark). Skin prick tests were done in duplicate according to the EAACI guidelines (Dreborg 1989) with a histamine standard of 10 mg/ml and the diluent as a negative control. The allergens used were birch, timothy grass, mugwort, horse, dog, cat, Dermatophagoides pteronyssinus and D. farinae and two moulds (Alternaria alternata and Cladosporium herbarum at 1:10 w/v). A positive reaction was defined as a reaction of at least three mm in diameter and at least half the size of the reaction to histamine.

Ultrasound of carotids

High-resolution B-mode carotid ultrasonography was performed with a portable ultrasound scanner (Brüel & Kjær Medical Systems) using a 7.5MHz transducer to provide an index of atherosclerosis. The scanning and reading protocols were identical to those used in the Glostrup Population Study (Joakimsen et al. 1997). The common carotid artery, the glomus region and the first centimetres of the internal carotid arteries on both sides were scanned. The examination included longitudinal images from the front and the side as well as transverse images. The intima-media wall thickness (IMT) was defined as the mean of the maximum IMT for the far wall on both the left and right side. Atheromatous plaques were registered and classified according to size and number (Pignoli et al. 1986, Wagenknecht et al. 1995).

Ultrasound of thyroid gland

Thyroid ultrasound examinations were performed using a portable ultrasound scanner (LOGIQTM _100, Milwaukee, Wisconsin, USA) fitted with a 7.5 MHz linear transducer (GE Yokogawa Medical Systems LTD, Tokyo, Japan). Subjects were examined in supine position with the neck hyperextended. Thyroid volume was measured using

transverse scans to obtain the width and depth of each lobe and longitudinal scans to measure length. The volume of each lobe was calculated according to the formula of an ellipsoid: width * length * thickness * Π/6 (Knudsen et al. 1999). Thyroid structure was described as homogeneous, uninodular, multinodular, or cystic.

3. Laboratory measurements

Blood samples were collected as the first procedure after information about the study and signing of the informed consent. Participants over 25 years had been fasting overnight. Blood samples were drawn by venipuncture at normal venous pressure. Blood was collected in BD-Vacutainer Systems TM, Belliver Industrial Estate, Plymouth PL6 7BP, UK. Whole blood was allowed to clot and serum and plasma were separated by centrifugation for 10 minutes at 1500G at 20°C. Samples were stored at -20°C until analyses. A spot urine sample was collected from each participant and samples were stored at 4 °C until shipment.

For bio bank: 12 x 0.5 ml of EDTA-plasma, 12 x 0.5 ml of serum, and 3 x 1.8 ml of urine from each subject were stored at -20°C. DNA from white cells of each subject was extracted and stored at -20°C until transfer to -80°C . The bio bank is located at the Steno Diabetes Centre. The samples taken in Denmark are located at Bispebjerg Hospital.

Anti HAV

Test tube: BD-Vacutainer dry No. 367619. Separated into a Nunc Cryo Tube 1.8 ml No. 363401.
Blood component: a minimum of 1 ml serum.
Preparation: Allowed to rest for at least 30 minutes before centrifugation. Centrifuged at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.

Anti HCV

Test tube: BD-Vacutainer dry No. 367619. Separated into a Nunc Cryo Tube 4.5 ml No. 363452.
Blood component: a minimum of 4.5 ml serum.
Preparation: Allowed to rest for at least 30 minutes before centrifugation. Centrifuged at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.

Apoliprotein

Test tube: BD-Vacutainer dry No. 367619. Separated into a Nunc Cryo Tube 1.8 ml No. 363401.
Blood component: a minimum of 1 ml serum.

Preparation: Allowed to rest for at least 30 minutes before centrifugation. Centrifuged at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.
Method: awaiting analysis.

C-peptide

Test tube: BD-Vacutainer dry No. 367619. Separated into a Nunc Cryo Tube 4.5 ml No. 363452.
Blood component: a minimum of 1 ml of serum.
Preparation: Allowed to stand for >30 minutes and <1.5 hour before centrifugation. Centrifuged at 4°C or at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.
Method of analysis: Wallac Auto Delfia.
Reference: Auto DELFIATMInsulin kit B080-101, Wallac Oy, Finland.
Laboratory: Steno Diabetes Centre, Gentofte, Denmark.
Normal range: (fasting) 200-700 pmol/l.

DNA

Test tube: BD-Vacutainer K3E 15% 0.12 ml No. 368457.
Blood component: Nuclear cells (buffy coat) from 3 x 10 ml EDTA blood.
Preparation: Stored at room temperature until centrifugation at 20°C, 1500G for 15 minutes. The buffy coat from 3 x 10 ml EDTA blood is divided into two portions and frozen in cryotubes at –80°C, if possible, otherwise frozen at –20°C until transferred to –80°C.
DNA extraction: Steno Diabetes Centre, Gentofte, Denmark.

Free fatty acids

Test tube: BD-Vacutainer K3E 15% 0.12 ml no. 368457. Separated into a Nunc Cryo Tube 1.8 ml No. 363401.
Blood component: a minimum of 1.8 ml EDTA-plasma.
Preparation: Put on ice immediately, within 30 minutes centrifuged at 4°C, 1500G for 10 minutes. Stored frozen at -20°C.
Method: awaiting analysis.

Glucose

Test tube: BD-Vacutainer FH 20mg 143 I.U. No. 367764, separated into Nunc Cryo Tube 4.5 ml No.363452.

Blood component: a minimum of 1 ml plasma.
Preparation: Put on ice immediately, within 1 hour centrifuged at 4°C, 1500G for 10 minutes. Stored frozen at -20°C.
Method: Hexokinase/G6P-DH-Determination on Hitachi 912 System.
Laboratory: Steno Diabetes Centre, Gentofte, Denmark.

HbA1c

Test tube: BioRAD Sample Preparation kit. (Na-heparinised (5µl) capillary in Ebendorf tube with 1 ml EDTA and potassium cyanide solution (0.25 mmol/l)).
Preparation: The capillary was filled with blood stabilized with EDTA, and transferred into the sample preparation vial and shacked to rinse the blood from the capillary.
Method: Ion exchange HPLC; measured by Bio-Rad VARIANTTM.
Reference: BioRad Variant Hemoglobin A1c Program. Instruction Manual.
Laboratory: Steno Diabetes Centre, Gentofte, Denmark.
Normal range: 4.1 – 6.4%.

HbsAg

Test tube: BD-Vacutainer K3E 15% 0.12 ml No. 368457. Separated into 2 Nunc Cryo Tube 4.5 ml No. 363452.
Blood component: a minimum of 8 ml EDTA-plasma.
Preparation: Centrifuged at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.

IgE

Test tube: BD-Vacutainer K3E 15% 0.12 ml No. 368457.
Blood component: a minimum of 4 ml EDTA-plasma.
Preparation: Centrifuged at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.
The total serum IgE levels were determined by paper radioimmunosorbent test (PRIST, Pharmacia, Sweden). The upper reference limits for total serum IgE were defined according to Backer et al. (1992).
Specific IgE was analysed using the Magic Lite SQ Allergy Screen (ALK, Hørsholm, Denmark), a rapid solid phase, non-competitive, immunochemiluminometric assay for the detection of specific IgE antibody. The allergens of interest (i.e. the most common aeroallergens in Denmark) are covalently coupled to paramagnetic particles, which

allows their separation without centrifugation and the reaction with the specific IgE antibody in serum. Samples with RLUs greater than the calculated cut-off values were considered positive.

Insulin

Test tube: BD-Vacutainer dry No. 367619. Separated into a Nunc Cryo Tube 4.5 ml No. 363452 Blood component: a minimum of 1 ml of serum.
Preparation: Allowed to stand for >30 minutes and <1.5 hour before centrifugation. Centrifuged at 4°C or at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.
Method of analysis: Enzyme-linked two-site immunoassay for quantification of intact insulin in human serum (Wallac Auto Delfia).
References: Auto DELFIATMInsulin kit B080-101, Wallac Oy, Finland (Andersen et al. 1993).
Laboratory: Steno Diabetes Centre, Gentofte, Denmark.

Lipids

Test tube: BD-Vacutainer dry No. 367619. Separated into Nunc Cryo Tube 1.8 ml No. 363401.
Blood component: a minimum of 1.5 ml serum.
Preparation: Allowed to rest for at least 30 minutes before centrifugation. Centrifuged at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.
Methods: Enzymatic colorimetric tests using Hitachi 917.
Total cholesterol: CHOD-PAP, Roche 1491458.
HDL: HDL-Cholesterol plus, Roche 1930648.
Triacylglycol (triglyceride): Triglycerides GPO-PAP, Roche 1730711.
LDL and VLDL values were calculated from these.
Laboratory: Department of Clinical Chemistry, Bispebjerg Hospital, University of Copenhagen, Denmark.

Liver function tests

Test tube: BD-Vacutainer dry No. 367619. Separated into Nunc Cryo Tube 1.8 ml No. 363401.
Blood component: a minimum of 1 ml serum.
Preparation: Allowed to rest for at least 30 minutes before centrifugation. Centrifuged at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.

Methods: Serum-bilirubin, -albumin, -aspartate aminotransferase and -alkaline phosphatases were determined by routine methods on an auto-analyser (Hitachi 917).
Albumin: ALB plus (BCG), Roche 1970909.
ASAT: ASAT/GOT, Roche 1876848.
Alkaline phosphatase: Alkaline phosphatase optimised, Roche 1877348.
Bilirubin: Bilirubin (DPD).
Laboratory: Department of Clinical Chemistry, Copenhagen University Hospital, Bispebjerg, Denmark.
Serum samples were stored at -20°C for later analysis of serologic tests for hepatitis B and C.

Markers of fibrosis

Test tube: BD-Vacutainer dry No. 367619. Separated into Nunc Cryo Tube 1.8 ml No. 363401.
Blood component: Serum.
Preparation: Allowed to rest for at least 30 minutes before centrifugation. Centrifuged at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.
Methods: YKL-40 is determined on serum samples by means of radioimmuno-assay (Johansen et al. 1993) at the Department of Rheumatology, Hvidovre Hospital, University of Copenhagen, Denmark). The intra- and inter-assay coefficients of variation were < 6.5% and < 12% and the detection limit was 20 µg/l. The median serum YKL-40 in 260 healthy adults with a median age of 48 years was 102 µg/l (upper 95th percentile=247 µg/l) (Johansen et al. 1996).
Serum P-III-P was measured by a commercially available RIA (Orion Diagnostica, Espoo, inland) (Risteli et al. 1988). The intra- and inter-assay coefficients of variation were 4.5% and 5.5%. The median serum P-III-P in 260 healthy adults described above was 3 µg/l (95th percentile=5.4 µg/l).

Serum hyaluronan was measured by a commercially available radiometric assay (Pharmacia, Uppsala, Sweden) based on the use of specific hyaluronan-binding proteins isolated from bovine cartilage. The intra- and inter-assay coefficients of variation were 10% and 8%. The median serum hyaluronan in 247 healthy adults was 28 µg/l (95th percentile=97 µg/l) (Brandt et al. 1987).

Serum T3, T4 and TSH

Test tube: BD-Vacutainer dry No. 367619. Separated into 2 Nunc Cryo Tube 1.8 ml No. 363401.
Blood component: a minimum of 3 ml serum.
Preparation: Allowed to rest for at least 30 minutes before centrifugation. Centrifuged at 20°C, 1500G for 10 minutes. Stored frozen at -20°C.

Thyroid function was assessed by measuring serum free thyroxine (FT4) and free T3 (FT3) and serum TSH on ADVIA® Centaur analyzer using ADVIA reagents from Bayer (Bayer Corporation, Leverkusen, Germany). The assay ranges were (information by supplier): serum FT4, 1.3-155 pmol/l (0.1-12.0 ng/dl); FT3, 0.3-30.8 pmol/l (0.2-20 pg/ml); and TSH, 0.010-150 mIU/l. The normal ranges in Caucasian populations are: serum FT4, 8.4-23.2 pmol/l (0.6-1.8 ng/dl); FT3, 3.8-8.4 pmol/l (0.25-0.55 pg/ml); and TSH, 0.4-3.7 mIU/l. The precision of the assays were (CV%) serum FT4, 3.03 % at level 13.9 pmol/l (1.1 ng/dl); FT3, 2.87 % at level 6.6 pmol/l (4.3 pg/ml); TSH, 5.87 % at level 0.74 mIU/l.

Urine albumin/creatinine ratio

Test tube: Bjørn Nielsen glass tube 7.5 x 12.5.
Preparation: Spot urine. Stored at 4°C until shipment. Centrifuged before analysis.
Method: 1: U-albumin: Turbidimetric determination of albumin concentration in urine on Cobas Mira Plus, Roche Diagnostic Systems. 2: U-creatinine: Creatinine Jaffé method on a Hitachi 912 system.
Laboratory: Steno Diabetes Centre, Gentofte, Denmark.
Reference: Foster-Swanson et al. 1994. Urinary albumin to urinary creatinine ratio (mg albumin/g creatinine) is used as an estimate of albumin excretion rate. Urinary albumin excretion is considered to be abnormal if the albumin to creatinine ratio is > 20 mg/g.

Urinary iodine

Test tube: Nunc Cryo Tupe 4.5 ml No.363452.
Component: Spot urine.
Preparation: Stored frozen at-20°C.
Iodine in urine was determined by the Sandell-Kolthoff reaction after alkaline ashing as described in detail elsewhere (Andersen et al. 2002). Urinary iodine excretion was expressed in µg/l and as an estimate of

24h urinary iodine excretion. This estimate was based on measurement of creatinine concentration and the average 24h urinary creatinine excretion in an age and gender matched group.

Urine stix

Method: Nephur-Test® + LEUCO Boehringer Mannheim.
Preparation: Spot urine less than 4 hours.

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TABLES OF SELECTED VARIABLES BY AGE AND GENDER OF INUIT IN GREENLAND

The tables in part III are based on the participants living in Greenland and are exclusive of 13 participants with unknown ethnicity. The total number of participants was thus 2016 The number of participants varies from variable to variable; 1952 participants completed an interview or filled out a questionnaire; 1856 participants filled in the self-administered questionnaire; 1310 participated in the clinical examination and blood sampling. Furthermore, some questions were not posed to all participants and some of the clinical examinations and blood analyses were not performed for all age groups or in all study areas. N in table headings indicates the study base – N minus missing are the actual number of participants who answered the question. The percentage of missing cases is generally not shown in the tables except for a few variables with high and unequally distributed missing values.

1. Population

Table 3.1.1. Population and participants.

Gender and age	Population in study area No.	Random sample No.	Participants No.	Participation rate %
Men				
18-24	581	126	74	58.7
25-34	1144	339	196	57.8
35-44	1184	357	214	59.9
45-54	633	334	188	56.3
55-64	346	228	143	62.7
65+	209	144	81	56.3
Men total	4097	1528	896	58.6
Women				
18-24	569	93	79	84.9
25-34	1147	327	258	78.9
35-44	1220	366	287	78.4
45-54	615	339	233	68.7
55-64	350	250	158	63.2
65+	274	183	105	57.4
Women total	4174	1558	1120	71.9
Men and women	8271	3086	2016	65.3

2. Diet and life style

Table 3.2.1. Consumption of seal meat (N=1952; missing 73).

Gender and age	Daily %	4-6 times per week %	1-3 times per week %	2-3 times per month %	Less often %	Never %
Men						
18-24	0.0	2.9	26.5	33.8	25.0	11.8
25-34	0.0	2.7	29.2	28.1	32.4	7.6
35-44	1.0	2.9	37.7	31.9	26.1	0.5
45-54	3.4	6.9	41.1	30.3	18.3	0.0
55-64	7.8	7.0	51.9	26.4	7.0	0.0
65+	8.3	5.6	50.0	16.7	15.3	4.2
Men total	2.9	4.5	38.9	28.7	21.9	3.1
Women						
18-24	0.0	2.7	17.6	32.4	39.2	8.1
25-34	0.0	4.0	24.5	29.3	39.0	3.2
35-44	0.0	1.8	30.7	30.7	33.2	3.6
45-54	2.9	6.2	33.3	27.1	28.6	1.9
55-64	2.8	5.6	42.0	28.0	20.3	1.4
65+	2.2	10.0	42.2	27.8	15.6	2.2
Women total	1.2	4.5	31.4	29.1	30.8	3.1
Men and women	1.9	4.5	34.7	29.0	26.8	3.1

Table 3.2.2. Consumption of fish (N=1952; missing 84).

Gender and age	Daily %	4-6 times per week %	1-3 times per week %	2-3 times per month %	Less often %	Never %
Men						
18-24	1.5	7.4	27.9	33.8	20.6	8.8
25-34	0.0	6.5	36.4	27.7	25.5	3.8
35-44	0.0	3.5	53.7	25.4	16.4	1.0
45-54	1.7	10.3	47.4	25.7	14.3	0.6
55-64	5.5	15.6	50.0	21.9	6.3	0.8
65+	7.1	15.7	52.9	20.0	4.3	0.0
Men total	1.9	8.8	45.8	25.7	15.7	2.1
Women						
18-24	0.0	1.4	27.0	21.6	43.2	6.8
25-34	0.4	5.2	35.6	29.6	25.2	4.0
35-44	0.4	5.5	47.4	24.1	19.3	3.3
45-54	1.9	7.5	43.9	26.2	19.2	1.4
55-64	1.4	7.7	53.1	22.4	14.7	0.7
65+	3.4	13.8	63.2	10.3	9.2	0.0
Women total	1.1	6.5	44.5	24.3	20.9	2.7
Men and women	1.4	7.5	45.1	24.9	18.6	2.4

Table 3.2.3. Consumption of vegetables other than potatoes (N=1952; missing 124).

Gender and age	Daily %	4-6 times per week %	1-3 times per week %	2-3 times per month %	Less often %	Never %
Men						
18-24	13.2	45.6	30.9	2.9	7.4	0.0
25-34	16.2	48.1	21.1	8.6	4.3	1.6
35-44	18.0	39.0	26.8	7.3	6.3	2.4
45-54	13.5	34.5	29.8	11.7	7.6	2.9
55-64	10.2	31.4	33.1	11.0	7.6	6.8
65+	4.8	20.6	30.2	12.7	14.3	17.5
Men total	14.1	38.1	27.7	9.1	7.0	4.0
Women						
18-24	24.7	31.5	28.8	4.1	9.6	1.4
25-34	30.8	41.3	17.4	6.1	4.0	0.4
35-44	26.3	44.2	22.3	3.3	3.6	0.4
45-54	21.7	37.2	26.6	7.2	6.8	0.5
55-64	22.3	24.6	35.4	8.5	6.9	2.3
65+	18.4	23.0	25.3	11.5	18.4	3.4
Women total	25.1	36.8	24.4	6.2	6.5	1.0
Men and women	20.2	37.4	25.8	7.5	6.7	2.3

Table 3.2.4. Consumption of fresh fruit (N=1952; missing 131).

Gender and age	Daily %	4-6 times per week %	1-3 times per week %	2-3 times per month %	Less often %	Never %
Men						
18-24	11.8	19.1	38.2	11.8	19.1	0.0
25-34	8.8	18.2	38.7	20.4	13.3	0.6
35-44	13.0	21.0	37.5	13.0	12.5	3.0
45-54	7.0	23.4	31.0	15.2	18.7	4.7
55-64	13.9	13.9	30.4	9.6	22.6	9.6
65+	4.5	6.1	27.3	13.6	33.3	15.2
Men total	10.1	18.5	34.6	14.6	17.7	4.5
Women						
18-24	16.2	21.6	40.5	5.4	13.5	2.7
25-34	19.4	26.2	32.7	8.1	13.3	0.4
35-44	24.9	26.0	25.3	8.8	12.5	2.6
45-54	21.2	20.2	27.4	12.5	14.4	4.3
55-64	16.7	18.2	37.1	9.8	14.4	3.8
65+	8.2	16.5	31.8	9.4	28.2	5.9
Women total	19.7	22.7	30.7	9.3	14.7	2.8
Men and women	15.5	20.9	32.4	11.6	16.0	3.6

Table 3.2.5. How often did you during the last year eat a meal from your own or your family's catch? (N=1952; missing 110).

Gender and age	Daily %	4-6 times per week %	1-3 times per week %	2-3 times per month %	Less often %	Never %
Men						
18-24	1.5	7.5	40.3	13.4	28.4	9.0
25-34	2.2	8.1	40.0	17.8	23.8	8.1
35-44	3.4	12.3	35.5	15.8	24.6	8.4
45-54	7.4	15.9	27.8	12.5	28.4	8.0
55-64	7.8	13.3	34.4	10.9	18.0	15.6
65+	10.4	20.9	31.3	4.5	29.9	3.0
Men total	5.1	12.6	34.7	13.7	24.9	9.0
Women						
18-24	1.4	6.8	25.7	20.3	40.5	5.4
25-34	2.9	9.0	31.4	19.2	29.0	8.6
35-44	2.5	9.1	36.2	15.2	23.2	13.8
45-54	3.9	13.7	33.3	9.3	28.9	10.8
55-64	2.3	10.0	37.7	10.8	27.7	11.5
65+	4.6	14.9	29.9	8.0	24.1	18.4
Women total	3.0	10.4	33.4	14.2	27.7	11.4
Men and women	3.9	11.4	34.0	14.0	26.4	10.3

Table 3.2.6. Physical activity (N=1952; missing 93).

Gender and age	Physically inactive %	Moderately physically active %	Very physically active %
Men			
18-24	9.1	33.3	57.6
25-34	13.3	58.6	28.2
35-44	15.3	58.6	26.1
45-54	14.8	55.7	29.5
55-64	19.1	59.6	21.3
65+	21.6	59.5	18.9
Men total	15.4	56.2	28.3
Women			
18-24	10.0	68.6	21.4
25-34	15.6	71.6	12.8
35-44	14.3	75.1	10.6
45-54	22.6	69.7	7.7
55-64	21.0	76.8	2.2
65+	26.4	69.2	4.4
Women total	18.0	72.4	9.6
Men and women	16.8	65.1	18.0

Table 3.2.7. Smoking (N=1952; missing 24).

Gender and age	Non-smoker %	Previous smoker %	1-14 cigarettes per day %	15+ cigarettes per day %	Pipe or cigar smoker %
Men					
18-24	20.6	2.9	63.2	10.3	2.9
25-34	14.0	8.6	46.8	28.0	2.7
35-44	9.7	15.5	44.0	25.6	5.3
45-54	9.4	12.7	41.4	27.6	8.8
55-64	9.5	24.1	38.7	15.3	12.4
65+	16.9	27.3	32.5	10.4	13.0
Men total	12.0	14.8	43.7	22.3	7.1
Women					
18-24	17.6	6.8	62.2	10.8	2.7
25-34	10.1	11.3	66.5	8.9	3.2
35-44	10.0	14.7	56.3	14.7	4.3
45-54	12.3	18.3	42.5	21.0	5.9
55-64	21.6	16.2	46.6	10.8	4.7
65+	29.3	20.2	38.4	6.1	6.1
Women total	14.4	14.8	53.2	13.0	4.5
Men and women	13.4	14.8	49.0	17.2	5.7

Table 3.2.8. Smoking: pack-years (N=1952; missing 51).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	0.0	2.3	6.1	2.6	2.9
25-34	0.0	6.8	14.4	7.5	9.0
35-44	0.0	10.2	28.0	14.3	16.4
45-54	0.0	16.0	48.9	24.8	41.5
55-64	0.0	21.0	82.6	33.4	44.1
65+	0.0	15.3	70.5	36.1	78.8
Men total	0.0	9.8	40.0	19.1	37.7
Women					
18-24	0.0	1.6	3.9	2.5	5.6
25-34	0.0	4.4	11.3	5.0	4.7
35-44	0.0	7.3	18.8	8.6	7.6
45-54	0.0	9.8	31.3	16.6	45.1
55-64	0.0	7.5	30.3	12.3	15.6
65+	0.0	4.9	26.5	11.6	20.8
Women total	0.0	5.5	22.5	9.8	23.1
Men and women	0.0	7.2	29.5	14.0	30.9

3. Language and childhood

Table 3.3.1. Mastering of Greenlandic language (N=1952; missing 128).

Gender and age	Fluently %	Fairly well %	With difficulty %	Not at all %
Men				
18-24	92.4	7.6	0.0	0.0
25-34	88.0	8.7	2.7	0.5
35-44	96.6	2.0	1.5	0.0
45-54	94.1	2.9	2.4	0.6
55-64	96.0	3.2	0.8	0.0
65+	88.9	4.2	2.8	4.2
Men total	93.0	4.5	1.8	0.6
Women				
18-24	89.2	9.5	1.4	0.0
25-34	91.5	4.7	3.0	0.9
35-44	97.8	1.8	0.4	0.0
45-54	94.6	3.4	1.5	0.5
55-64	94.8	2.2	1.5	1.5
65+	97.7	0.0	0.0	2.3
Women total	94.6	3.3	1.4	0.7
Men and women	93.9	3.8	1.6	0.7

Table 3.3.2. Mastering of Danish language (N=1952; missing 140).

Gender and age	Fluently %	Fairly well %	With difficulty %	Not at all %
Men				
18-24	32.4	38.2	27.9	1.5
25-34	51.1	24.7	22.0	2.2
35-44	46.5	27.2	22.3	4.0
45-54	38.6	26.9	22.8	11.7
55-64	27.6	19.5	33.3	19.5
65+	17.7	17.7	30.6	33.9
Men total	39.6	25.6	25.1	9.7
Women				
18-24	29.2	36.1	29.2	5.6
25-34	36.8	29.3	26.4	7.5
35-44	54.4	23.7	17.5	4.4
45-54	40.6	24.3	23.3	11.9
55-64	16.0	21.4	35.1	27.5
65+	7.0	15.1	31.4	46.5
Women total	36.6	25.0	25.1	13.3
Men and women	37.9	25.3	25.1	11.7

Table 3.3.3. Place of residence at age 5 (N=1952; missing 64).

Gender and age	Village in Greenland %	Town in Greenland %	Denmark %
Men			
18-24	14.9	85.1	0.0
25-34	19.4	77.4	3.2
35-44	31.9	67.6	0.5
45-54	45.9	53.6	0.6
55-64	57.9	42.1	0.0
65+	71.4	28.6	0.0
Men total	38.2	60.9	1.0
Women			
18-24	11.0	89.0	0.0
25-34	27.0	71.7	1.2
35-44	34.8	64.9	0.4
45-54	48.6	50.5	0.9
55-64	59.6	39.7	0.7
65+	65.2	34.8	0.0
Women total	40.2	59.1	0.7
Men and women	39.3	59.9	0.8

Table 3.3.4. Father's occupation (N=1952; missing 224).

Gender and age	Hunter/ fisherman %	Salaried employee %	Other %	Missing %
Men				
18-24	23.5	55.9	10.3	10.3
25-34	33.0	49.5	8.5	9.0
35-44	37.3	45.0	8.6	9.1
45-54	62.8	24.6	6.6	6.0
55-64	57.6	26.6	2.9	12.9
65+	70.0	10.0	2.5	17.5
Men total	46.9	36.3	6.8	9.9
Women				
18-24	21.6	51.4	6.8	20.3
25-34	38.3	42.3	7.1	12.3
35-44	37.0	44.1	8.9	10.0
45-54	51.6	32.4	4.0	12.0
55-64	60.1	22.2	2.6	15.0
65+	67.7	12.1	6.1	14.1
Women total	45.3	35.8	6.2	12.7
Men and women	46.1	36.0	6.5	11.5

Table 3.3.5. Mother's occupation (N=1952; missing 181).

Gender and age	Homemaker/ hunter's wife %	Salaried employee %	Other %	Missing %
Men				
18-24	7.4	83.8	2.9	5.9
25-34	16.5	70.2	6.9	6.4
35-44	31.6	58.9	3.3	6.2
45-54	56.8	26.8	7.1	9.3
55-64	72.7	10.8	2.9	13.7
65+	67.5	2.5	7.5	22.5
Men total	41.6	43.6	5.2	9.6
Women				
18-24	10.8	75.7	5.4	8.1
25-34	19.4	66.0	6.7	7.9
35-44	34.2	55.9	6.8	3.2
45-54	59.1	28.4	4.4	8.0
55-64	64.7	12.4	5.2	17.6
65+	64.6	10.1	7.1	18.2
Women total	41.4	43.6	6.0	9.0
Men and women	41.5	43.6	5.6	9.3

Table 3.3.6. Alcohol problems at home as a child (N=1856; missing 130).

Gender and age	Yes, often %	Yes, now and then %	No, never %	Missing %
Men				
18-24	4.6	50.8	40.0	4.6
25-34	14.3	48.6	34.3	2.9
35-44	11.1	42.2	44.7	2.0
45-54	5.1	29.4	59.9	5.6
55-64	1.5	17.9	64.9	15.7
65+	0.0	6.8	82.2	11.0
Men total	7.4	34.4	52.0	6.2
Women				
18-24	19.7	43.7	33.8	2.8
25-34	21.4	41.9	35.9	0.9
35-44	12.5	37.3	44.3	5.9
45-54	6.4	30.3	57.8	5.5
55-64	2.1	12.3	68.5	17.1
65+	3.2	3.2	69.9	23.7
Women total	11.4	30.7	50.2	7.6
Men and women	9.6	32.3	51.0	7.0

4. General health

Table 3.4.1. Self-rated health (N=1952; 32 missing).

Gender and age	Excellent %	Good %	Fair %	Poor %	Very poor %
Men					
18-24	22.1	45.6	32.4	0.0	0.0
25-34	31.7	50.0	17.2	1.1	0.0
35-44	22.3	47.1	26.2	4.4	0.0
45-54	30.0	38.3	28.9	2.8	0.0
55-64	15.2	42.0	37.7	5.1	0.0
65+	13.0	33.8	46.8	6.5	0.0
Men total	24.0	43.7	29.0	3.3	0.0
Women					
18-24	17.8	56.2	24.7	1.4	0.0
25-34	27.1	53.4	18.3	0.8	0.4
35-44	30.5	48.0	17.9	2.9	0.7
45-54	21.3	40.7	31.2	5.9	0.9
55-64	13.2	37.5	41.0	6.9	1.4
65+	10.3	33.0	48.5	7.2	1.0
Women total	22.7	45.5	27.1	3.8	0.8
Men and women	23.3	44.7	28.0	3.6	0.4

Table 3.4.2. Symptoms, illness, and longstanding disease (N=1952; missing: symptoms 40, illness 104, disease 69).

Gender and age	Somewhat troubled by one or more of 15 symptoms during last two weeks %	Seriously troubled by one or more of 15 symptoms during last two weeks %	Activity restricted due to illness (last two weeks) %	Longstanding disease %
Men				
18-24	52.9	38.2	4.4	20.6
25-34	61.2	33.0	13.1	33.9
35-44	53.4	36.4	14.7	40.6
45-54	58.7	36.3	14.7	40.9
55-64	52.7	42.7	22.0	53.8
65+	38.5	51.3	27.5	58.9
Men total	54.7	38.1	15.7	41.2
Women				
18-24	49.3	46.6	13.9	20.5
25-34	50.0	42.0	16.8	30.9
35-44	49.5	44.4	14.0	34.1
45-54	42.7	53.6	21.3	48.6
55-64	44.6	50.0	28.0	51.8
65+	30.2	68.8	27.3	69.7
Women total	45.8	48.9	19.1	40.7
Men and women	49.7	44.1	17.6	40.9

5. Mental health

Table 3.5.1. General Health Questionnaire (N=1736; missing 256).

Gender and age	Robust (score 0-1) %	Vulnerable (score 2+) %	Missing %
Men			
18-24	54.1	41.0	4.9
25-34	62.7	29.8	7.5
35-44	60.0	29.4	10.6
45-54	61.7	24.0	14.4
55-64	55.8	19.4	24.8
65+	47.9	19.7	32.4
Men total	58.6	26.7	14.7
Women			
18-24	46.9	46.9	6.3
25-34	55.6	34.6	9.8
35-44	62.8	27.9	9.3
45-54	58.9	25.8	15.3
55-64	50.7	21.4	27.9
65+	44.1	30.1	25.8
Women total	55.7	29.5	14.8
Men and women	57.0	28.2	14.7

Table 3.5.2. Suicidal thoughts and suicidal attempts (N=1856; missing 178).

Gender and age	No suicidal thoughts %	Ever had serious suicidal thoughts %	Ever attempted suicide %	Missing %
Men				
18-24	75.4	23.1	18.5	1.5
25-34	69.7	26.3	10.3	4.0
35-44	76.9	17.1	9.5	6.0
45-54	83.6	11.3	6.2	5.1
55-64	81.3	4.5	2.2	14.2
65+	74.0	5.5	2.7	20.5
Men total	77.2	15.2	7.9	7.7
Women				
18-24	64.8	33.8	19.7	1.4
25-34	64.5	30.8	18.4	4.7
35-44	78.2	16.2	14.4	5.5
45-54	74.3	16.5	10.6	9.2
55-64	69.2	0.7	2.7	30.1
65+	71.0	3.2	2.2	25.8
Women total	71.4	17.4	12.1	11.1
Men and women	74.0	16.4	10.2	9.6

6. Anthropometric measurements

Table 3.6.1. Height (cm) (N=1310; missing 5).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	165.3	173.5	182.2	173.5	6.4
25-34	166.0	174.0	182.5	174.1	6.1
35-44	162.0	171.0	179.2	170.8	6.7
45-54	156.8	166.0	174.6	166.0	6.8
55-64	155.9	165.5	172.1	164.2	6.8
65+	152.7	163.0	168.5	161.5	6.1
Men total	158.5	169.0	179.0	168.9	7.8
Women					
18-24	153.1	163.0	169.0	161.0	6.7
25-34	154.0	159.5	167.0	160.3	5.1
35-44	151.1	159.0	167.5	159.3	6.0
45-54	148.0	155.0	162.0	155.1	5.5
55-64	145.8	154.0	162.0	153.9	5.4
65+	142.4	149.0	158.0	149.5	5.9
Women total	149.0	157.0	166.0	157.1	6.6
Men and women	150.8	162.0	175.0	162.3	9.2

Table 3.6.2. Weight (kg) (N=1310; missing 8).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	59.9	72.1	88.7	74.1	12.4
25-34	60.7	73.5	96.4	76.4	14.3
35-44	60.8	74.5	92.9	76.0	12.7
45-54	56.9	69.9	88.2	72.7	16.4
55-64	53.5	72.3	92.1	72.9	15.7
65+	57.3	65.0	9.8	69.5	13.9
Men total	58.2	72.3	92.0	74.1	14.5
Women					
18-24	52.1	64.2	80.6	65.2	11.6
25-34	50.4	63.0	79.7	64.5	11.6
35-44	50.8	64.3	82.0	66.2	13.5
45-54	47.1	66.4	86.3	66.7	14.1
55-64	44.7	64.0	84.3	64.5	16.0
65+	42.0	63.6	82.8	63.2	15.4
Women total	49.0	64.0	82.0	65.3	13.7
Men and women	52.0	68.0	87.7	69.2	14.7

Table 3.6.3. Body Mass Index (kg/m²) (N=1310; missing 8).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	20.8	23.9	30.0	24.6	3.7
25-34	20.7	24.7	30.8	25.1	4.1
35-44	21.5	25.3	31.2	26.0	3.8
45-54	21.5	25.5	31.4	26.3	4.8
55-64	20.4	26.3	33.8	27.0	5.3
65+	21.5	25.4	33.2	26.7	4.8
Men total	21.0	25.3	31.6	26.0	4.5
Women					
18-24	20.5	24.1	32.6	25.2	4.3
25-34	20.0	24.5	31.1	25.1	4.2
35-44	20.9	25.3	32.7	26.0	4.9
45-54	20.7	27.3	34.7	27.7	5.4
55-64	19.5	26.5	34.7	27.2	6.2
65+	19.5	27.7	36.8	28.2	6.4
Women total	20.3	25.8	33.1	26.4	5.3
Men and women	20.7	25.4	32.7	26.2	5.0

Table 3.6.4 BMI categories (N=1310; missing 8).

Gender and age	Underweight BMI<18.5 %	Normal BMI 18.5-24.9 %	Overweight BMI 25.0-29.9 %	Obese BMI>=30.0 %
Men				
18-24	0.0	70.2	21.1	8.8
25-34	2.6	52.1	33.3	12.0
35-44	0.7	42.6	41.9	14.7
45-54	0.8	42.1	40.5	16.7
55-64	2.3	38.6	30.7	28.4
65+	0.0	40.8	40.8	18.4
Men total	1.2	46.4	36.0	16.4
Women				
18-24	0.0	60.0	26.0	14.0
25-34	2.9	51.4	32.4	13.3
35-44	3.2	44.7	34.2	17.9
45-54	3.5	30.1	33.6	32.9
55-64	5.6	33.6	31.8	29.0
65+	6.1	25.8	36.4	31.8
Women total	3.6	41.2	32.9	22.4
Men and women	2.5	43.5	34.3	19.7

Table 3.6.5. Waist circumference (cm) (N=1310; missing 13).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	74.0	81.0	101.8	84.3	10.4
25-34	76.0	85.0	102.5	87.6	11.2
35-44	79.0	89.0	104.0	90.2	10.8
45-54	77.0	89.0	103.3	90.5	12.2
55-64	78.0	95.0	112.2	94.8	13.0
65+	82.0	92.5	112.1	95.3	12.7
Men total	77.0	88.0	106.0	90.3	12.1
Women					
18-24	69.0	79.5	97.5	82.0	11.0
25-34	70.0	81.0	97.5	82.6	10.6
35-44	71.0	83.5	103.4	85.5	12.5
45-54	71.0	90.0	108.5	90.6	13.6
55-64	71.0	90.0	109.3	90.3	14.4
65+	77.0	94.0	115.5	94.9	14.8
Women total	71.0	85.0	105.3	87.1	13.3
Men and women	73.0	87.0	106.0	88.5	12.9

Table 3.6.6. Waist-hip ratio (N=1310; missing 13).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	0.80	0.86	0.99	0.87	0.07
25-34	0.82	0.89	1.01	0.90	0.07
35-44	0.85	0.92	1.02	0.92	0.07
45-54	0.85	0.94	1.03	0.94	0.07
55-64	0.88	0.95	1.07	0.96	0.09
65+	0.88	0.97	1.05	0.96	0.06
Men total	0.84	0.92	1.03	0.93	0.08
Women					
18-24	0.76	0.82	0.92	0.83	0.06
25-34	0.77	0.84	0.93	0.85	0.06
35-44	0.78	0.85	0.97	0.87	0.08
45-54	0.80	0.90	1.00	0.91	0.09
55-64	0.82	0.91	1.02	0.92	0.09
65+	0.86	0.93	1.05	0.94	0.07
Women total	0.79	0.87	0.99	0.88	0.08
Men and women	0.80	0.89	1.01	0.90	0.08

7. Cardiovascular disease and diabetes

Table 3.7.1. Diastolic blood pressure (mm Hg) (N=1310; missing 39).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	56.8	72.0	90.0	72.9	12.5
25-34	60.0	72.0	90.0	74.4	11.6
35-44	61.0	75.0	87.8	74.0	10.1
45-54	60.0	75.0	90.0	74.9	12.7
55-64	64.5	77.5	92.1	77.7	11.6
65+	56.4	70.0	85.0	70.7	11.4
Men total	60.0	73.0	90.0	74.4	11.7
Women					
18-24	57.5	69.0	80.0	67.1	9.0
25-34	59.0	70.0	80.8	69.0	9.3
35-44	60.0	70.0	85.0	71.1	9.9
45-54	60.0	72.5	85.0	73.7	10.2
55-64	59.5	70.0	91.6	74.4	13.8
65+	59.0	72.8	92.0	74.0	12.2
Women total	60.0	70.0	86.0	71.6	10.9
Men and women	60.0	71.0	88.0	72.9	11.3

Table 3.7.2. Systolic blood pressure (mm Hg) (N=1310; missing 39).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	102.0	120.0	134.4	120.2	13.2
25-34	100.6	115.0	132.2	116.0	12.5
35-44	101.0	114.0	131.8	116.3	13.0
45-54	97.1	115.0	138.2	117.1	16.7
55-64	104.2	126.0	160.0	128.0	20.1
65+	105.3	132.0	162.5	132.9	22.5
Men total	100.0	118.0	140.0	120.1	17.0
Women					
18-24	95.0	110.0	122.5	108.6	10.2
25-34	95.0	109.0	120.0	107.6	10.8
35-44	95.0	110.0	127.8	111.3	12.8
45-54	100.0	119.0	140.0	119.5	17.2
55-64	105.0	125.0	162.6	130.1	22.4
65+	111.5	143.3	179.0	144.3	23.9
Women total	98.0	113.0	145.1	117.8	19.7
Men and women	100.0	115.0	142.9	118.8	18.6

Table 3.7.3. Total cholesterol (mmol/l) (N=1310; missing 4).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	3.9	5.2	6.3	5.2	1.0
25-34	4.3	5.5	6.9	5.5	1.1
35-44	4.4	6.1	7.3	5.9	1.1
45-54	5.2	6.3	7.4	6.4	1.1
55-64	4.5	6.0	7.9	6.2	1.3
65+	4.5	5.7	7.2	5.7	1.0
Men total	4.5	5.8	7.3	5.9	1.2
Women					
18-24	3.8	4.9	5.9	5.0	1.1
25-34	4.3	5.4	6.6	5.4	0.9
35-44	4.6	5.8	7.1	5.9	1.0
45-54	4.9	6.2	7.7	6.3	1.1
55-64	5.1	6.3	8.0	6.5	1.1
65+	4.9	6.6	8.0	6.4	1.3
Women total	4.5	5.9	7.4	5.9	1.2
Men and women	4.5	5.9	7.3	5.9	1.2

Table 3.7.4. High density cholesterol (HDL) (mmol/l) (N=1310; missing 4).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	1.0	1.2	1.7	1.3	0.3
25-34	1.0	1.3	1.8	1.4	0.4
35-44	1.0	1.5	1.9	1.5	0.4
45-54	1.1	1.6	2.4	1.7	0.5
55-64	1.1	1.7	2.3	1.7	0.5
65+	0.9	1.6	2.4	1.6	0.6
Men total	1.0	1.5	2.2	1.5	0.5
Women					
18-24	1.1	1.4	1.8	1.4	0.3
25-34	1.1	1.5	2.0	1.5	0.4
35-44	1.1	1.6	2.1	1.6	0.4
45-54	1.1	1.6	2.3	1.6	0.4
55-64	1.1	1.6	2.2	1.7	0.5
65+	1.2	1.7	2.2	1.7	0.4
Women total	1.1	1.5	2.2	1.6	0.4
Men and women	1.1	1.5	2.2	1.6	0.4

Table 3.7.5. Fasting low density cholesterol (LDL) (mmol/l) (N=1092; missing 7).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	-	-	-	-	-
25-34	2.3	3.5	5.0	3.6	0.9
35-44	2.5	3.9	5.4	3.9	1.0
45-54	3.0	4.1	5.7	4.3	1.2
55-64	2.6	4.0	5.8	4.0	1.1
65+	2.7	3.5	5.1	3.7	1.0
Men total	2.7	3.9	5.3	3.9	1.1
Women					
18-24	-	-	-	-	-
25-34	2.3	3.4	4.5	3.4	0.8
35-44	2.7	3.7	5.0	3.8	0.9
45-54	2.8	4.0	5.5	4.1	1.1
55-64	3.1	4.1	5.8	4.3	1.2
65+	2.8	4.3	5.6	4.3	1.1
Women total	2.7	3.8	5.2	3.9	1.0
Men and women	2.7	3.8	5.3	3.9	1.1

Table 3.7.6. Fasting very low density cholesterol (VLDL) (mmol/l) (N=1092; missing 7).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	-	-	-	-	-
25-34	0.3	0.5	1.0	0.6	0.3
35-44	0.3	0.4	0.9	0.5	0.3
45-54	0.2	0.4	0.9	0.5	0.3
55-64	0.3	0.4	0.8	0.5	0.3
65+	0.2	0.4	0.7	0.4	0.2
Men total	0.3	0.4	0.9	0.5	0.3
Women					
18-24	-	-	-	-	-
25-34	0.3	0.4	0.7	0.5	0.2
35-44	0.3	0.4	0.7	0.5	0.2
45-54	0.3	0.5	0.9	0.5	0.3
55-64	0.3	0.5	0.9	0.5	0.3
65+	0.3	0.5	0.8	0.5	0.2
Women total	0.3	0.4	0.8	0.5	0.2
Men and women	0.3	0.4	0.8	0.5	0.3

Table 3.7.7. Fasting serum triacylglycol (triglyceride) (mmol/l) (N=1092; missing 1).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	-	-	-	-	-
25-34	0.6	1.1	2.2	1.3	0.7
35-44	0.6	1.0	2.3	1.2	0.8
45-54	0.5	0.9	1.9	1.0	0.6
55-64	0.6	1.0	1.7	1.1	0.6
65+	0.5	0.9	1.6	1.0	0.4
Men total	0.6	1.0	2.0	1.1	0.7
Women					
18-24	-	-	-	-	-
25-34	0.6	0.9	1.6	1.1	0.6
35-44	0.6	0.9	1.8	1.1	0.8
45-54	0.7	1.1	2.1	1.2	0.6
55-64	0.6	1.1	2.0	1.2	0.6
65+	0.6	1.0	1.8	1.1	0.5
Women total	0.6	1.0	1.9	1.1	0.7
Men and women	0.6	1.0	1.9	1.1	0.7

Table 3.7.8. Fasting plasma glucose (mmol/l) (N=1092; missing 41).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	-	-	-	-	-
25-34	4.9	5.5	6.1	5.6	0.7
35-44	5.0	5.7	6.4	5.7	0.5
45-54	4.8	5.7	6.7	5.7	0.9
55-64	5.1	6.0	7.1	6.1	0.9
65+	5.2	6.0	7.4	6.1	1.0
Men total	5.0	5.7	6.7	5.8	0.8
Women					
18-24	-	-	-	-	-
25-34	4.8	5.3	6.0	5.3	0.4
35-44	4.8	5.5	6.2	5.5	0.7
45-54	5.0	5.6	6.9	5.8	1.2
55-64	5.0	5.9	7.0	6.2	2.2
65+	5.0	6.0	7.4	6.3	1.9
Women total	4.9	5.6	6.6	5.7	1.3
Men and women	4.9	5.6	6.6	5.8	1.1

Table 3.7.9. Serum glycated hemoglobin (HbA1c) (percent) (N=1310; missing 5).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	5.4	5.7	6.2	5.8	0.3
25-34	5.5	6.0	6.4	5.9	0.4
35-44	5.7	6.1	6.7	6.1	0.4
45-54	5.9	6.3	6.8	6.3	0.4
55-64	6.0	6.4	7.1	6.5	0.5
65+	5.9	6.5	7.2	6.5	0.5
Men total	5.6	6.1	6.8	6.2	0.5
Women					
18-24	5.1	5.6	5.9	5.5	0.3
25-34	5.3	5.7	6.1	5.7	0.3
35-44	5.5	5.9	6.4	5.9	0.4
45-54	5.6	6.2	6.8	6.2	0.6
55-64	5.8	6.5	7.2	6.6	1.0
65+	5.8	6.5	7.0	6.6	1.0
Women total	5.4	6.0	6.7	6.1	0.7
Men and women	5.5	6.1	6.7	6.1	0.6

Table 3.7.10. Fasting serum insulin (pmol/l) (N=1092; missing 43).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	-	-	-	-	-
25-34	22.0	39.0	89.0	51.2	44.9
35-44	20.1	37.5	67.8	41.3	20.5
45-54	11.2	30.0	69.8	38.6	33.3
55-64	17.9	38.0	102.3	50.4	33.5
65+	14.0	32.0	94.0	39.9	33.2
Men total	16.0	35.0	79.0	44.0	33.5
Women					
18-24	-	-	-	-	-
25-34	23.5	44.5	93.0	51.8	27.8
35-44	20.2	40.0	79.8	46.9	29.0
45-54	20.2	44.0	100.4	52.8	38.6
55-64	22.5	41.0	93.0	49.9	28.2
65+	19.0	46.0	116.6	52.3	33.8
Women total	22.0	43.0	90.6	50.3	31.5
Men and women	19.0	39.0	88.0	47.6	32.5

Table 3.7.11. Fasting serum C-peptide (pmol/l) (N=1092; missing 43).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	-	-	-	-	-
25-34	228	357	927	464	298
35-44	232	376	682	415	195
45-54	205	393	705	433	233
55-64	214	467	963	557	318
65+	224	412	713	447	196
Men total	224	388	780	457	256
Women					
18-24	-	-	-	-	-
25-34	266	402	723	444	168
35-44	272	430	756	472	225
45-54	285	480	921	546	349
55-64	260	447	1090	538	308
65+	242	563	938	591	325
Women total	268	443	830	506	277
Men and women	247	419	810	485	269

Table 3.7.12. Diabetes and impaired glucose tolerance (N=836; missing 8).

Gender and age	IGT[1] %	Diabetes[2] %
Men		
18-24	-	-
25-34	-	-
35-44	4.2	1.7
45-54	6.2	7.1
55-64	9.1	20.8
65+	22.7	20.5
Men total	8.2	9.9
Women		
18-24	-	-
25-34	-	-
35-44	5.0	3.9
45-54	11.5	10.8
55-64	15.5	11.7
65+	30.2	19.0
Women total	12.4	9.5
Men and women	10.6	9.7

1 Fasting plasma glucose <7.0 mmol/l and 2 hr plasma glucose 7.8-11.0 mmol/l.

2 Fasting plasma glucose >7.0 mmol/l or 2 hr plasma glucose >11.1 mmol/l or currently treated for diabetes.

8. Lung disease and allergy

Table 3.8.1. Lung function (FEV1 litres) (N=1310; missing 15).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	3.9	4.3	5.5	4.5	0.6
25-34	3.6	4.4	5.2	4.4	0.6
35-44	3.2	4.1	4.8	4.1	0.6
45-54	2.6	3.4	4.1	3.4	0.6
55-64	1.7	2.8	3.6	2.8	0.7
65+	1.3	2.1	3.0	2.1	0.6
Men total	2.4	3.8	4.8	3.6	1.0
Women					
18-24	2.9	3.3	3.8	3.3	0.4
25-34	2.8	3.2	3.8	3.2	0.4
35-44	2.4	3.0	3.7	3.0	0.5
45-54	1.7	2.5	3.1	2.4	0.5
55-64	1.4	2.0	2.6	2.0	0.5
65+	0.9	1.5	2.2	1.5	0.5
Women total	1.6	2.8	3.6	2.7	0.7
Men and women	1.8	3.1	4.4	3.1	1.0

Table 3.8.2. Lung function (FEV1% of predicted value) (N=1310; missing 57).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	80.2	90.7	108.7	92.9	10.2
25-34	83.1	97.7	114.4	98.4	13.7
35-44	85.9	104.4	120.8	103.7	13.0
45-54	82.4	100.5	119.5	100.7	15.2
55-64	71.3	97.3	118.3	94.1	21.6
65+	52.7	79.8	114.5	81.6	23.6
Men total	77.7	97.9	118.2	97.4	17.2
Women					
18-24	80.8	93.1	109.3	94.3	9.7
25-34	88.7	102.6	116.2	102.1	11.1
35-44	87.3	106.0	121.0	105.1	14.7
45-54	74.2	101.5	118.6	99.9	16.7
55-64	59.7	90.0	115.7	89.7	20.5
65+	48.4	81.6	113.5	79.3	22.2
Women total	74.3	100.3	118.3	98.2	17.6
Men and women	75.9	98.9	118.3	97.8	17.4

Table 3.8.3. Lung function (FVC litres) (N=1310; missing 28).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	4.7	5.2	6.9	5.5	0.8
25-34	4.5	5.5	6.3	5.4	0.8
35-44	4.1	5.2	6.1	5.1	0.7
45-54	3.4	4.3	5.3	4.3	0.7
55-64	2.6	3.7	4.6	3.7	0.8
65+	2.0	2.9	4.1	2.9	0.8
Men total	3.3	4.7	6.0	4.6	1.1
Women					
18-24	3.3	4.0	4.4	3.9	0.4
25-34	3.3	3.9	4.5	3.9	0.5
35-44	3.0	3.6	4.5	3.7	0.6
45-54	2.2	3.0	3.7	3.0	0.6
55-64	1.9	2.6	3.3	2.6	0.5
65+	1.4	2.0	2.8	2.0	0.6
Women total	2.1	3.4	4.3	3.3	0.8
Men and women	2.4	3.8	5.5	3.9	1.2

Table 3.8.4. Lung function (FEV1/FVC ratio) (N=1310; missing 28).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	75.6	82.1	89.2	82.0	6.2
25-34	74.8	80.8	87.8	81.0	5.7
35-44	73.0	79.5	85.5	79.4	5.1
45-54	69.3	78.3	86.5	78.1	7.3
55-64	64.5	76.0	84.9	74.9	9.0
65+	56.9	72.3	80.9	70.6	9.3
Men total	69.5	79.0	86.4	78.3	7.6
Women					
18-24	77.1	85.5	90.1	84.8	4.9
25-34	76.4	83.3	90.5	83.5	6.1
35-44	75.5	82.7	88.1	82.2	5.3
45-54	75.0	81.0	88.6	80.9	6.3
55-64	66.0	76.6	84.8	76.5	7.9
65+	59.5	75.9	84.3	75.7	21.7
Women total	72.7	81.3	88.7	81.0	9.2
Men and women	70.8	80.4	87.7	79.8	8.6

Table 3.8.5. Skin prick test (N=644; missing 252).

Gender and age	Reaction of >=3mm for at leaste one allergen Positive %	Negative %	Missing %
Men			
18-24	17.5	70.2	12.3
25-34	9.2	59.2	31.6
35-44	7.9	33.3	58.7
45-54	2.8	43.1	54.2
Men total	9.0	51.1	39.9
Women			
18-24	20.0	58.0	22.0
25-34	13.1	49.2	37.7
35-44	12.7	50.0	37.3
45-54	9.6	40.4	50.0
Women total	13.0	48.4	38.6
Men and women	11.3	49.5	39.1

9. Alcohol and liver disease

Table 3.9.1. Consumption of alcohol. No. of drinks per week (N= 1858; missing 313).

Gender and age	<1 %	1-7 %	8-21 %	22-35 %	≥36 %	Missing %
Men						
18-24	18.5	26.2	32.3	3.1	4.6	15.4
25-34	38.9	17.1	26.9	4.6	2.9	9.7
35-44	31.2	20.6	28.1	6.0	2.0	12.1
45-54	27.1	19.8	31.6	3.4	2.3	15.8
55-64	29.1	22.4	16.4	5.2	0.7	26.1
65+	46.6	20.5	13.7	0.0	0.0	19.2
Men total	32.0	20.4	25.8	4.3	2.1	15.6
Women						
18-24	45.1	28.2	12.7	4.2	0.0	9.9
25-34	50.0	24.8	10.7	1.3	0.9	12.4
35-44	36.2	29.2	15.9	1.1	0.0	17.7
45-54	36.7	25.2	11.5	0.5	0.5	25.7
55-64	57.8	21.1	4.8	1.4	0.0	15.0
65+	59.6	13.8	2.1	0.0	0.0	24.5
Women total	45.2	24.7	10.7	1.2	0.3	17.9
Men and women	39.3	22.8	17.4	2.5	1.1	16.8

Table 3.9.2. Modified CAGE (N=1858; missing 271) and brief MAST (N=1310; missing 40).

Gender and age	CAGE Positive %	CAGE Negative %	CAGE Missing %	MAST Positive %	MAST Negative %	MAST Missing %
Men						
18-24	23.1	61.5	15.4	1.8	96.5	1.8
25-34	26.9	62.9	10.3	6.0	92.3	1.7
35-44	34.7	54.8	10.6	11.8	86.0	2.2
45-54	28.8	59.9	11.3	13.4	83.5	3.1
55-64	26.9	52.2	20.9	12.5	85.2	2.3
65+	13.7	64.4	21.9	4.0	92.0	4.0
Men total	27.7	58.6	13.7	9.4	88.2	2.4
Women						
18-24	14.1	77.5	8.5	4.0	96.0	0.0
25-34	15.0	77.4	7.7	5.7	91.4	2.9
35-44	17.7	67.2	15.1	5.8	91.1	3.1
45-54	20.2	61.9	17.9	9.6	84.9	5.5
55-64	5.4	74.8	19.7	5.6	90.7	3.7
65+	3.2	70.2	26.6	0.0	95.5	4.5
Women total	14.3	70.4	15.3	5.9	90.6	3.5
Men and women	20.2	65.2	14.6	7.4	89.5	3.1

Table 3.9.3. Prevalence of icterus, spider naevi, ascites, and clinically evaluated fatness (N=1310; missing 58-63).

Gender and age	Icterus %	Spider naevi %	Ascites %	Fatness %
Men				
18-24	0.0	0.0	0.0	5.4
25-34	0.0	0.0	0.0	10.5
35-44	0.8	0.0	0.0	10.0
45-54	0.8	0.0	1.7	14.3
55-64	2.4	0.0	2.4	14.6
65+	2.1	0.0	0.0	8.5
Men total	0.9	0.0	0.7	11.1
Women				
18-24	0.0	0.0	0.0	18.8
25-34	0.0	0.0	0.0	21.9
35-44	0.6	0.0	0.0	19.9
45-54	0.0	0.7	0.0	30.4
55-64	0.0	0.0	0.0	25.2
65+	0.0	0.0	0.0	20.0
Women total	0.1	0.1	0.0	23.2
Men and women	0.5	0.1	0.3	17.9

Table 3.9.4. Serum bilirubine (mmol/l) (N=1310; missing 4).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	3.8	8.0	18.4	9.5	6.2
25-34	4.0	7.0	13.0	8.1	4.7
35-44	4.0	7.0	13.0	7.9	4.1
45-54	4.0	7.0	12.0	7.4	3.8
55-64	3.0	6.0	13.0	6.9	3.4
65+	4.0	6.0	9.9	6.7	2.5
Men total	4.0	7.0	13.0	7.8	4.3
Women					
18-24	3.0	6.0	11.0	6.6	4.3
25-34	3.0	6.0	11.0	6.3	3.2
35-44	3.2	6.0	11.0	6.7	3.1
45-54	3.0	6.0	10.0	6.5	2.7
55-64	3.0	6.0	11.0	6.4	3.0
65+	3.7	6.0	10.0	6.6	2.8
Women total	3.0	6.0	10.6	6.5	3.1
Men and women	3.0	6.0	12.0	7.1	3.7

Table 3.9.5. Serum aspartate aminotransferase (ASAT) (U/l) (N=1310; missing 4).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	21.0	27.0	39.4	29.9	10.8
25-34	21.0	29.0	42.2	30.6	10.1
35-44	22.0	31.0	50.4	36.3	23.8
45-54	25.0	35.0	56.2	40.4	21.8
55-64	26.0	36.0	85.4	45.8	29.9
65+	26.1	39.5	59.8	42.1	14.6
Men total	23.0	32.0	54.0	37.4	21.3
Women					
18-24	16.0	21.0	37.0	23.5	7.3
25-34	17.0	23.0	33.0	25.6	14.5
35-44	18.0	23.0	35.0	25.9	10.4
45-54	20.7	29.0	45.6	31.5	11.8
55-64	22.0	31.0	54.4	35.3	18.2
65+	22.0	30.5	48.2	33.3	12.2
Women total	18.0	25.0	42.0	28.8	13.7
Men and women	19.0	28.0	48.0	32.6	17.9

Table 3.9.6. Serum albumine (g/l) (N=1310; missing 4).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	42.0	45.3	48.5	45.3	2.4
25-34	41.9	44.0	48.0	44.4	3.6
35-44	40.0	43.0	47.0	43.1	3.1
45-54	40.0	43.0	46.0	43.1	3.1
55-64	40.0	42.0	46.0	42.1	3.8
65+	38.0	42.0	44.9	41.2	4.1
Men total	40.0	43.0	47.0	43.3	3.5
Women					
18-24	41.0	44.0	47.0	43.5	2.7
25-34	39.1	42.4	45.0	42.2	3.3
35-44	39.0	42.0	45.0	42.2	2.6
45-54	39.0	42.0	45.3	42.3	2.5
55-64	38.0	42.0	46.0	42.0	3.8
65+	37.7	41.0	45.0	40.8	5.2
Women total	39.0	42.0	45.3	42.2	3.3
Men and women	39.0	43.0	46.0	42.6	3.4

Table 3.9.7. Serum alkaline phosphatase (U/l) (N=1310; missing 4).

Gender and age	Percentiles 10%	50%	90%	mean	SD
Men					
18-24	140	186	256	198	51
25-34	122	179	238	180	48
35-44	115	171	232	172	47
45-54	112	176	262	180	56
55-64	119	184	275	194	65
65+	147	198	297	207	64
Men total	119	179	253	185	55
Women					
18-24	115	172	238	177	55
25-34	100	141	218	154	67
35-44	93	134	201	145	68
45-54	107	164	266	178	68
55-64	123	185	270	197	105
65+	135	196	332	216	72
Women total	104	155	244	170	77
Men and women	109	167	248	176	69

10. Thyroid disease

Table 3.10.1. Frequency of some common clinical manifestations of hyperthyroidism (N= 699; missing 8).

	Interview survey		Clinical study		Total	Participation rate	
Gender and age	Hyperactivity %	Palpitations %	Increased appetite %	Increased bowel acticity %	Fatigue %	Nervousness %	Mood disturbances %
Men							
18-24	11.1	16.7	11.1	5.6	33.3	25.0	22.2
25-34	20.0	23.6	29.1	24.1	25.5	21.4	32.7
35-44	17.5	23.8	17.5	19.0	22.2	17.7	23.8
45-54	8.3	20.8	18.1	25.0	27.8	14.5	15.3
55-64	5.8	21.2	9.6	23.1	28.8	19.4	13.5
65+	11.5	23.1	23.1	42.3	23.1	17.7	7.7
Men total	12.6	22.0	18.5	23.5	26.2	18.3	19.9
Women							
18-24	15.0	19.0	23.8	19.0	38.1	28.6	42.9
25-34	28.4	34.4	32.2	10.4	50.0	38.1	36.5
35-44	19.8	36.6	33.7	18.8	42.6	28.2	30.7
45-54	23.7	35.9	32.3	30.1	59.1	38.1	37.0
55-64	17.2	34.4	14.1	25.0	45.3	30.4	29.7
65+	19.4	48.4	29.0	29.0	61.3	27.3	32.3
Women total	22.0	35.6	29.1	21.2	49.8	33.4	34.1
Men and women	18.1	30.0	24.7	22.1	40.0	27.3	28.2

Table 3.10.2. Frequency of some common clinical manifestations of hypothyroidism (N= 699; missing 8).

Gender and age	Fatigue %	Decreased appetite %	Constipation %	Dry skin %	Depression – Moderate %
Men					
18-24	33.3	5.6	0.0	16.7	0.0
25-34	25.5	12.7	7.4	21.8	4.7
35-44	22.2	9.5	15.9	19.4	8.0
45-54	27.8	9.7	15.3	29.2	1.9
55-64	28.8	5.8	17.3	19.2	8.1
65+	23.1	11.5	19.2	7.7	5.9
Men total	26.2	9.4	13.7	21.1	5.2
Women					
18-24	38.1	14.3	0.0	23.8	7.7
25-34	50.0	16.7	18.8	32.3	10.3
35-44	42.6	23.0	27.7	32.7	4.7
45-54	59.1	12.9	32.3	36.6	16.9
55-64	45.3	12.5	31.3	18.8	13.0
65+	61.3	9.7	36.7	32.3	7.1
Women total	49.8	16.0	26.4	30.8	10.4
Men and women	40.0	13.3	21.2	26.8	8.3

Table 3.10.3. Self reported thyroid disorders (N= 699; missing 198).

Gender and age	Hypothyroidism %	Hyperthyroidism %	Goitre %
Men			
18-24	0.0	0.0	0.0
25-34	0.0	0.0	0.0
35-44	0.0	0.0	3.9
45-54	0.0	1.9	5.6
55-64	2.8	10.8	5.3
65+	7.7	8.3	14.3
Men total	1.0	2.9	4.3
Women			
18-24	0.0	0.0	7.7
25-34	1.3	1.3	7.5
35-44	3.5	2.3	0.0
45-54	3.2	1.6	9.0
55-64	0.0	5.6	5.4
65+	13.3	6.7	12.5
Women total	2.7	2.4	5.7
Men and women	2.0	2.6	5.1

Table 3.10.4 Reported family history of thyroid disorders (N= 699; missing 66).

	Hypothyroidism			Hyperthyroidism			Goitre		
Gender and age	Parent %	Sibling %	Both %	Parent %	Sibling %	Both %	Parent %	Sibling %	Both %
Men									
18-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-34	2.2	0.0	0.0	0.0	0.0	0.0	2.1	6.3	0.0
35-44	1.7	1.7	0.0	3.5	0.0	0.0	1.7	3.3	0.0
45-54	0.0	0.0	1.5	1.5	0.0	0.0	1.4	0.0	0.0
55-64	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0
65+	4.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Men total	1.6	0.8	0.4	1.2	0.0	0.0	1.1	2.3	0.0
Women									
18-24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-34	1.2	1.2	0.0	1.2	0.0	1.2	2.3	2.3	0.0
35-44	2.2	1.1	0.0	2.2	0.0	0.0	2.1	1.0	0.0
45-54	2.2	1.1	0.0	1.1	0.0	0.0	2.2	3.3	0.0
55-64	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65+	10.0	0.0	0.0	6.9	0.0	0.0	3.4	0.0	0.0
Women total	2.1	1.1	0.0	1.6	0.0	0.3	1.8	1.6	0.0
Men and women	1.9	1.0	0.2	1.4	0.0	0.2	1.5	1.9	0.0