

THEME: ENDOCRINOLOGY – DIABETES

12.00 – 12:15	Stig Andersen, Aarhus University* <i>Aspects of endocrinology in the Arctic</i>
12:15 – 12:30	Michael Lyng, Queen Ingrid's Hospital, Nuuk <i>Addressing challenges in chronic care in the primary health care system in Greenland - diabetes as an example</i>
12:30 – 12:45	Marit Eika Jørgensen, Steno Diabetes Center <i>Population research of diabetes in Greenland</i>
12:45 – 13:00	Torsten Lauritzen, Aarhus University <i>Preventive health checks and Screening for diabetes. Interventions in general practice with huge potential for improved health</i>

**Chair:
Jørn Olsen**

13:00 – 14:00 **LUNCH**



AARHUS UNIVERSITY



Aspects of Arctic Endocrinology

Stig Andersen

Kalaallit Nunaannit Ilinniagaqarpugut

Arctic Health Research Centre

Aalborg University Hospital

& Århus University



Consultant Endocrinologist

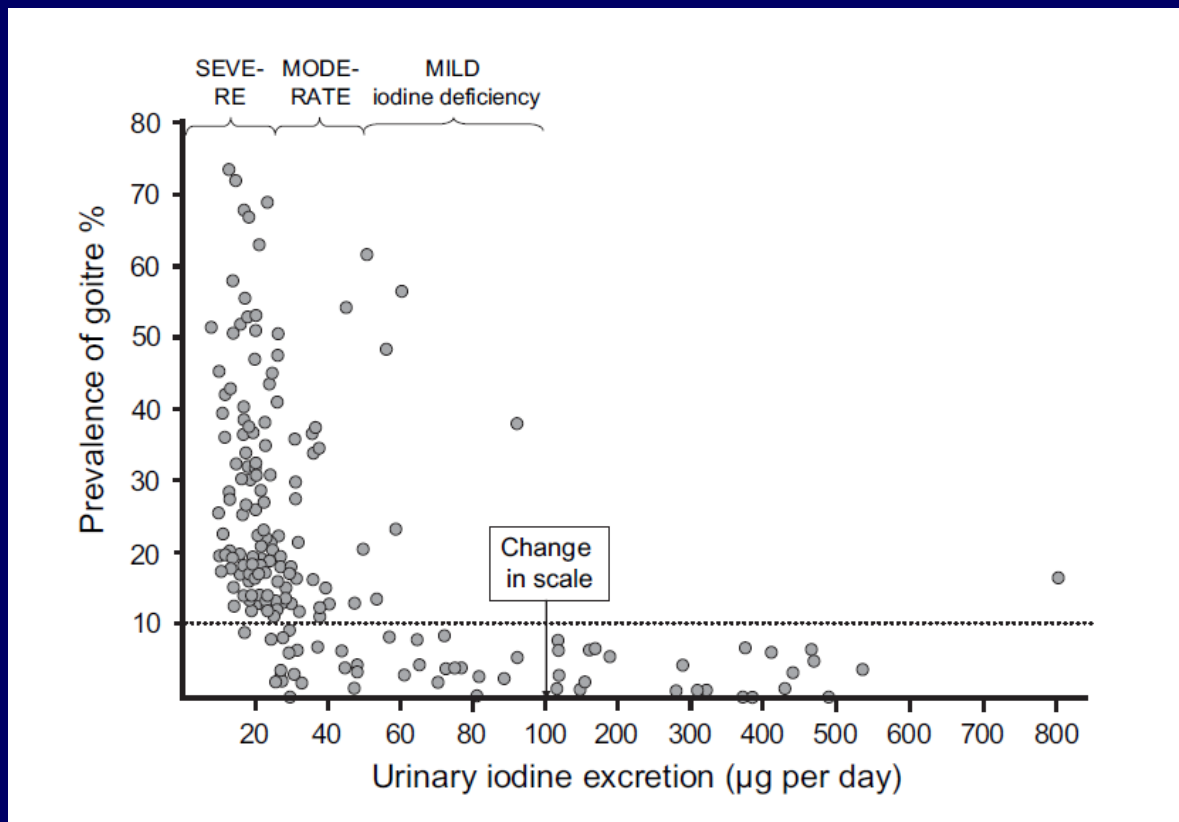
Arctic Health Research Centre

- Iodine
- Vitamin D
- Skeletal health
- Obesity & body build
- Thermogenesis
- Miscellaneous
 - Aging Inuit
 - and
 - other



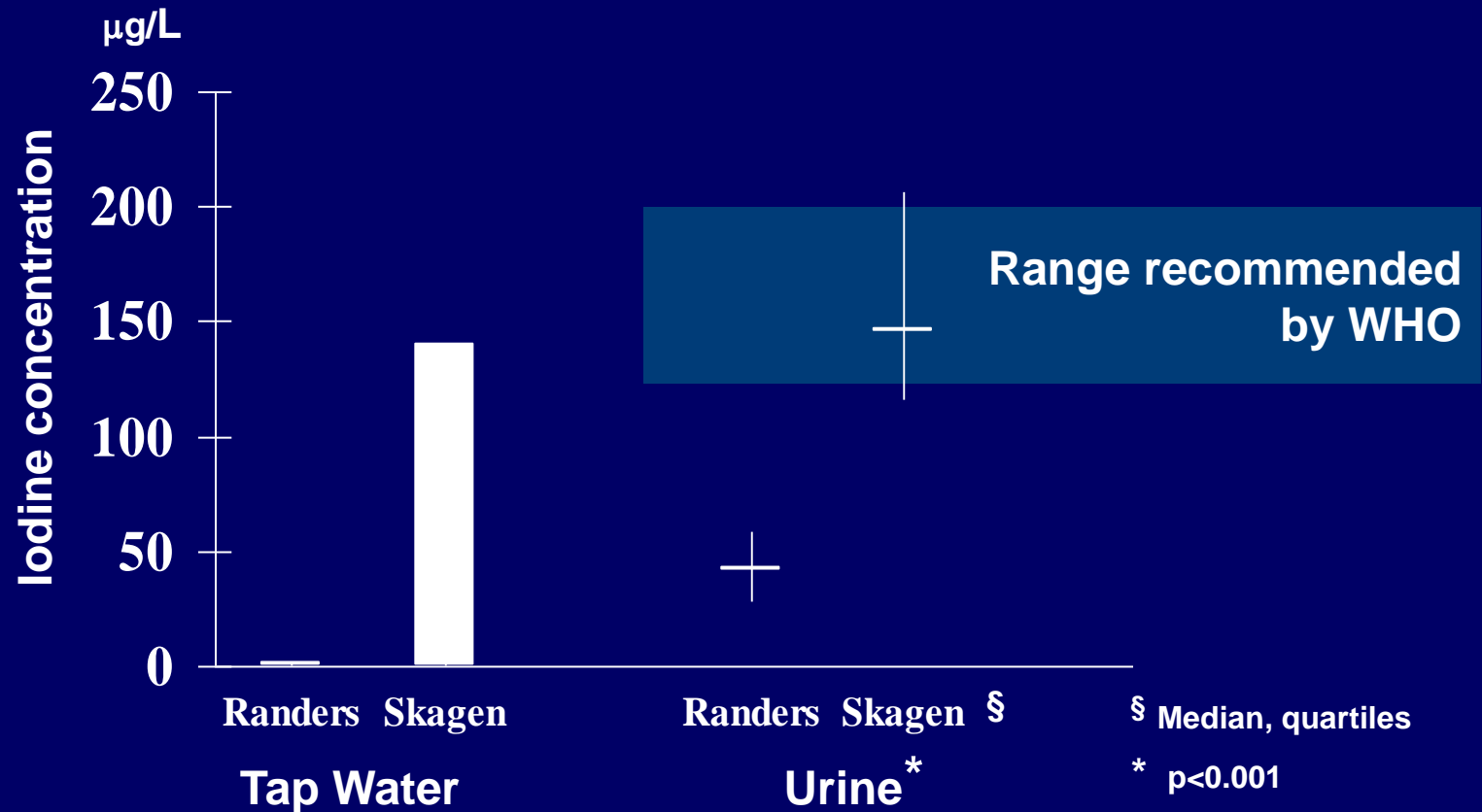
Iodine intake as a determinant of thyroid disorders in populations

Best Practice & Research Clinical Endocrinology & Metabolism 24 (2010) 13–27



Naturally occurring iodine in humic substances in drinking water in Denmark is bioavailable and determines population iodine intake

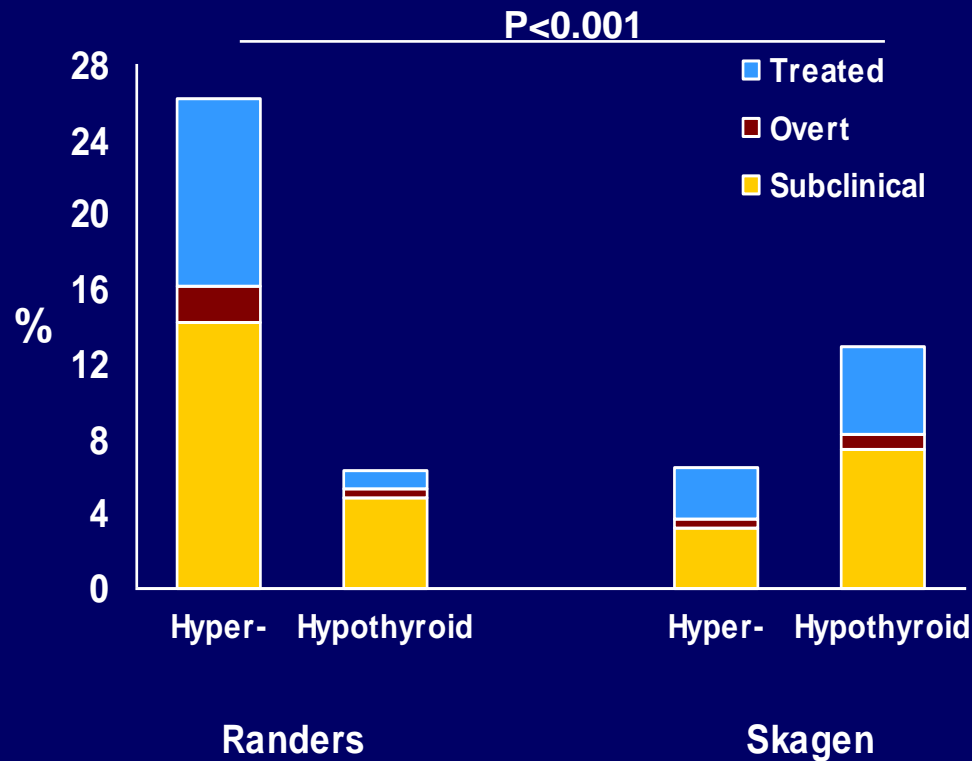
Stig Andersen^{1,2*}, Klaus M. Pedersen¹, Finn Iversen³, Steen Terpling³, Peter Gustenhoff¹, Steffen B. Petersen² and Peter Laurberg¹



More hypothyroidism and less hyperthyroidism with sufficient iodine nutrition compared to mild iodine deficiency—A comparative population-based study of older people

Stig Andersen^{a,*}, Finn Iversen^b, Steen Terpling^b, Klaus Michael Pedersen^a, Peter Gustenhoff^a, Peter Laurberg^a

Maturitas 64 (2009) 126–131



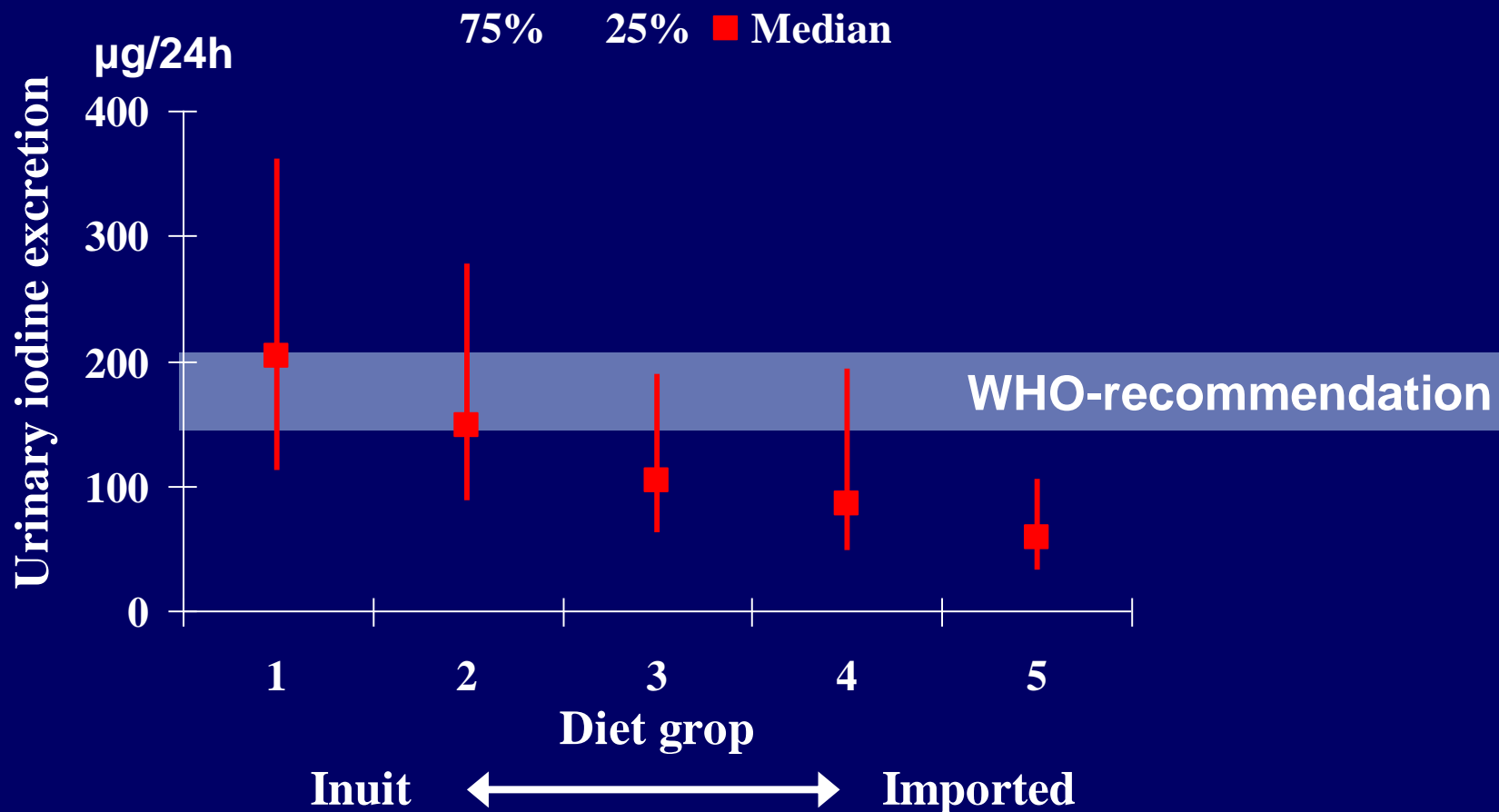
**How many ?
for the recommende intake**



Changes in iodine excretion in 50–69-y-old denizens of an Arctic society in transition and iodine excretion as a biomarker of the frequency of consumption of traditional Inuit foods^{1–3}

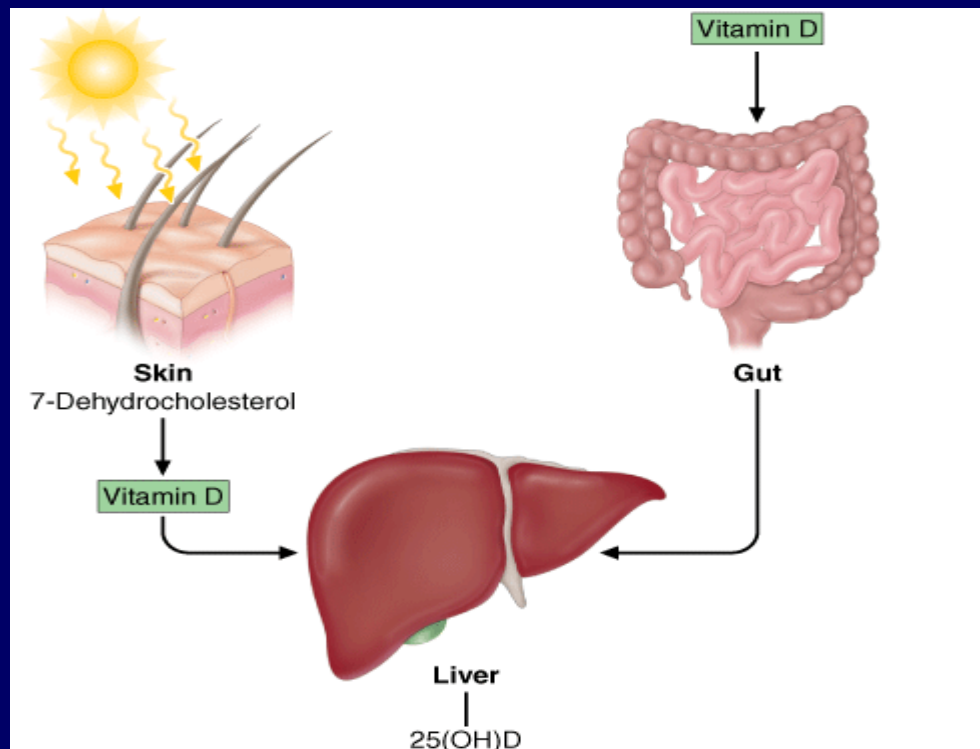
Stig Andersen, Bodil Hvingel, Kent Kleinschmidt, Torben Jørgensen, and Peter Laurberg

Am J Clin Nutr 2005;81:656–63.



Sources of Vitamin D

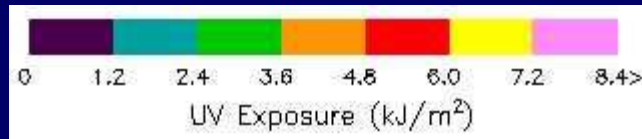
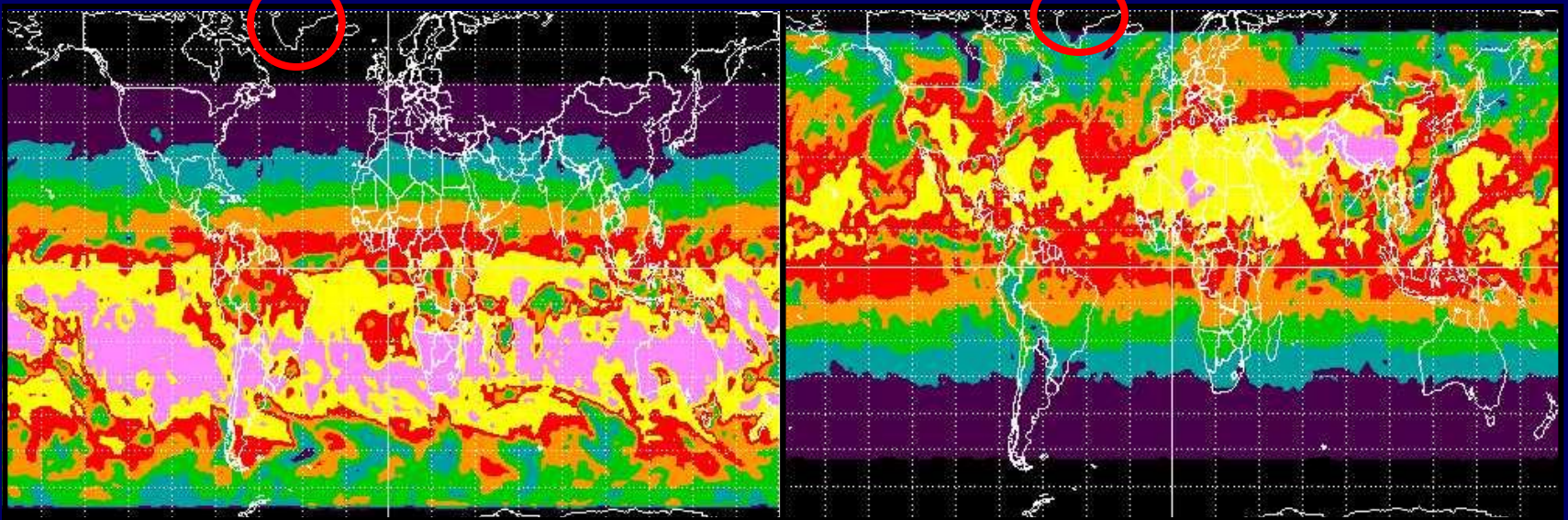
Dermal and Dietary



Global UV-B exposure by Season & Latitude

January

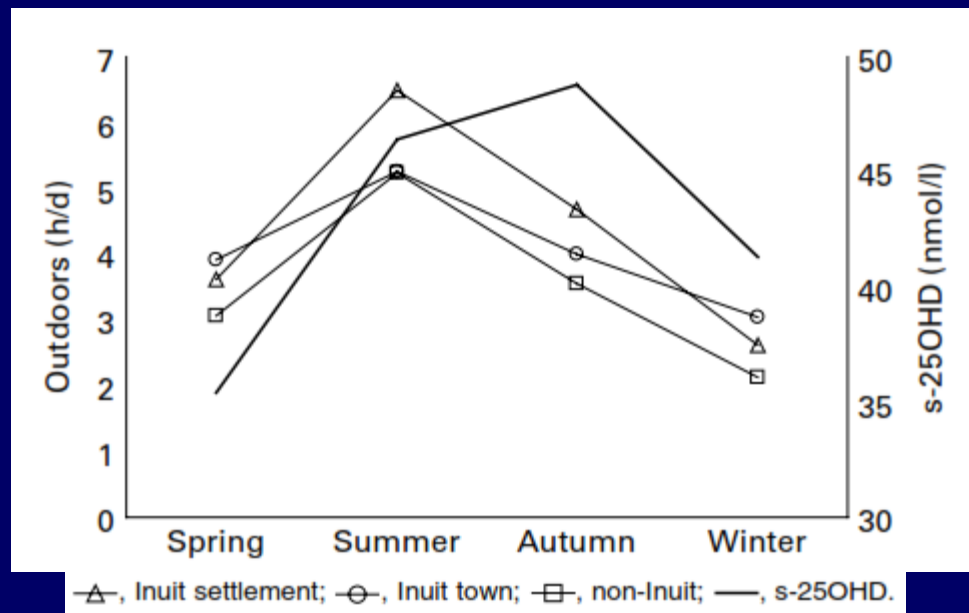
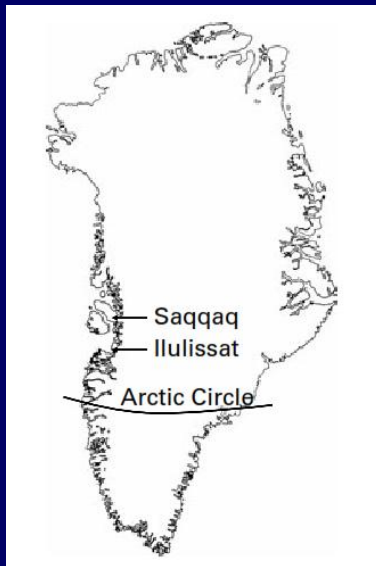
July



Total Ozone Mapping Spectrometer (TOMS)
<http://jwocky.gsfc.nasa.gov>

Vitamin D status in North Greenland is influenced by diet and season: indicators of dermal 25-hydroxy vitamin D production north of the Arctic Circle

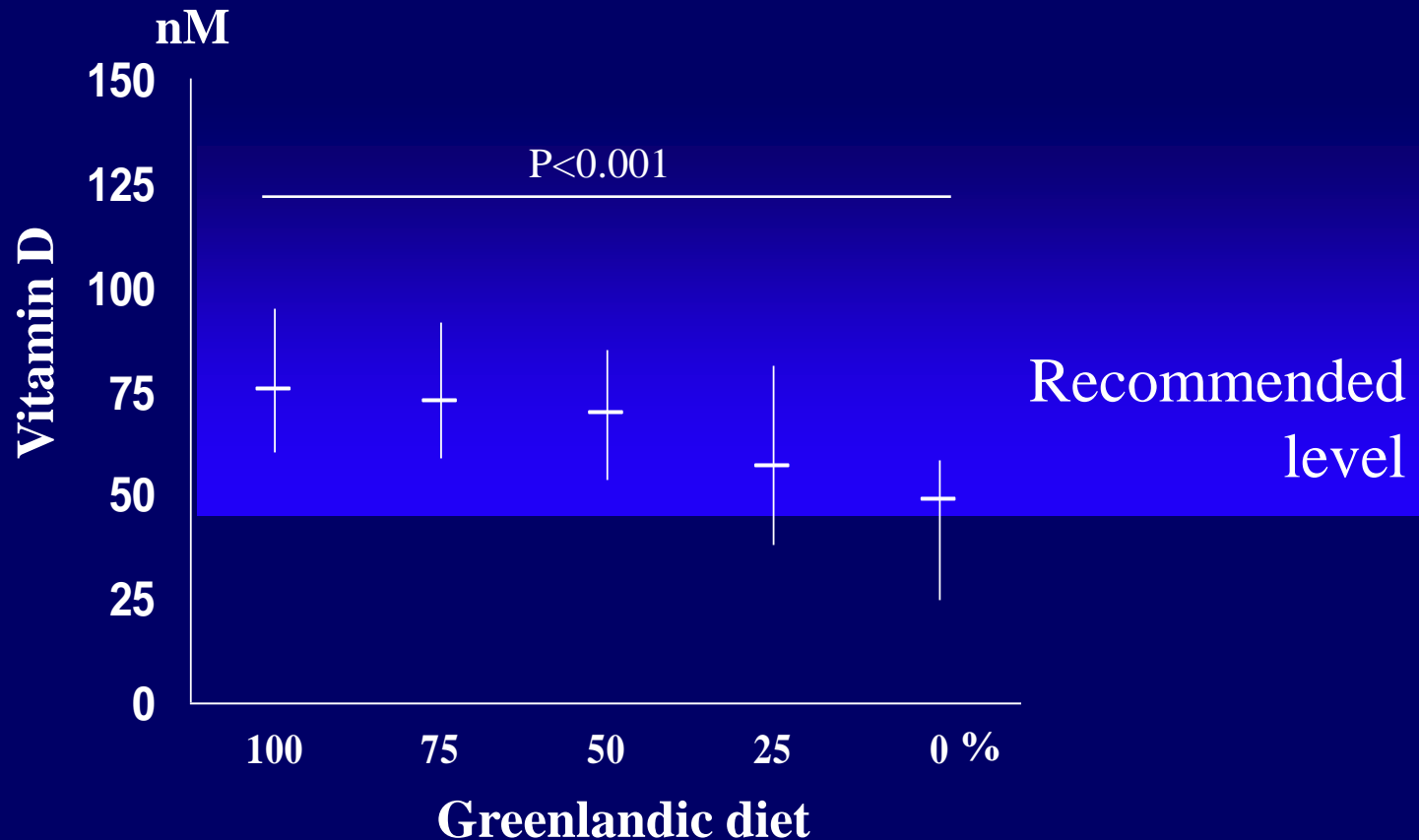
Stig Andersen^{1,2,3*}, Anna Jakobsen¹ and Peter Laurberg^{1,4}





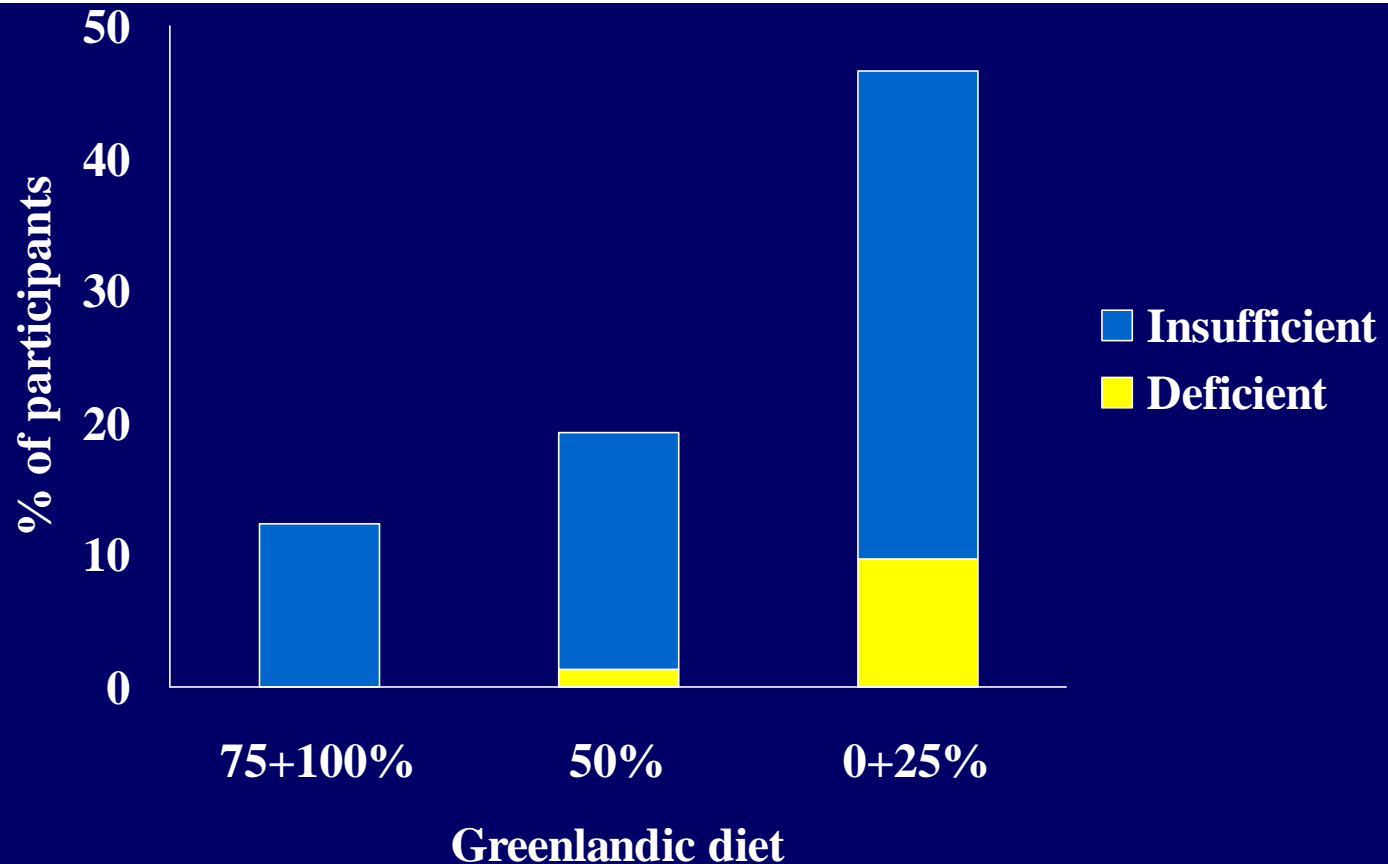
Vitamin D status in Greenland is influenced by diet and ethnicity: a population-based survey in an Arctic society in transition

Stig Andersen^{1,2*}, Peter Laurberg³, Bodil Hvingel⁴, Kent Kleinschmidt², Lene Heickendorff⁵ and Leif Mosekilde⁶



Vitamin D status in Greenland is influenced by diet and ethnicity: a population-based survey in an Arctic society in transition

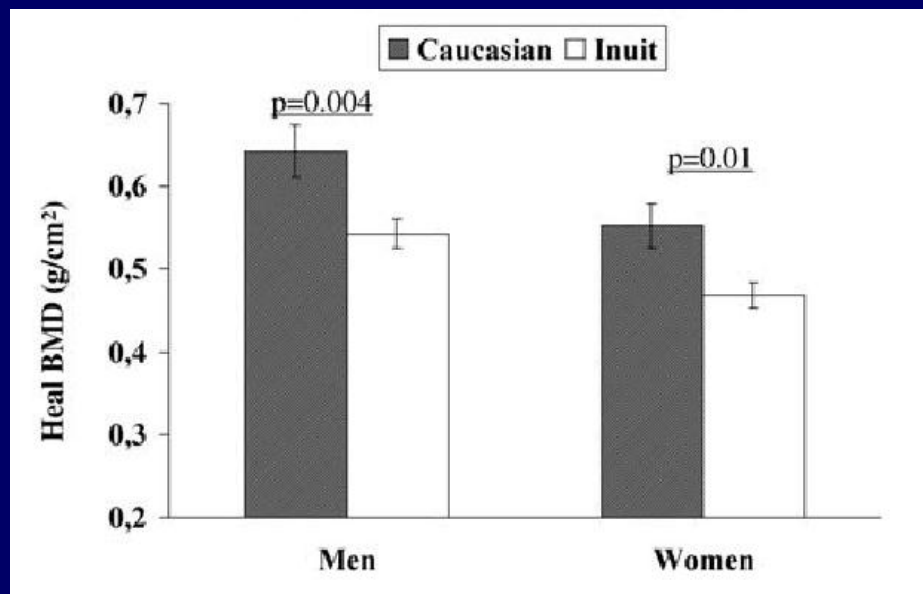
Stig Andersen^{1,2*}, Peter Laurberg³, Bodil Hvingel⁴, Kent Kleinschmidt², Lene Heickendorff⁵ and Leif Mosekilde⁶



Original Article

**Ethnic Differences in Bone Mineral Density Between Inuit
and Caucasians in North Greenland Are Caused by Differences
in Body Size**

Stig Andersen,^{,1,2} Eskild Boeskov,¹ and Peter Laurberg²*



Original Article

Ethnic Differences in Bone Mineral Density Between Inuit and Caucasians in North Greenland Are Caused by Differences in Body Size

Stig Andersen,^{,1,2} Eskild Boeskov,¹ and Peter Laurberg²*

	Univariate				Multivariate ^a			
	Arm		Heel		Arm		Heel	
	B	<i>p</i> -Value	B	<i>p</i> -Value	B	<i>p</i> -Value ^b	B	<i>p</i> -Value ^c
Gender ^d	−0.08	<0.001	−0.09	<0.001	−0.1	<0.001	−0.04	0.10
Age	0.001	0.56	−0.001	0.73	−0.001	0.48	−0.001	0.58
Ethnicity	0.03	0.16	0.11	<0.001	0.02	0.44	0.03	0.30
Smoking	0.01	0.30	−0.01	0.51	0.01	0.10	0.01	0.45
Residence ^e	0.01	0.67	0.002	0.96	0.04	0.82	0.01	0.70
Height ^f	0.002	0.008	0.007	<0.001	0.001	0.37	0.01	<0.001
Weight ^g	0.002	0.001	0.004	<0.001	−0.006	0.15	−0.01	0.24
BMI ^h	0.004	0.03	0.005	0.03	0.004	0.002	0.01	<0.001

Clinical risk factors for osteoporosis are common in Greenland

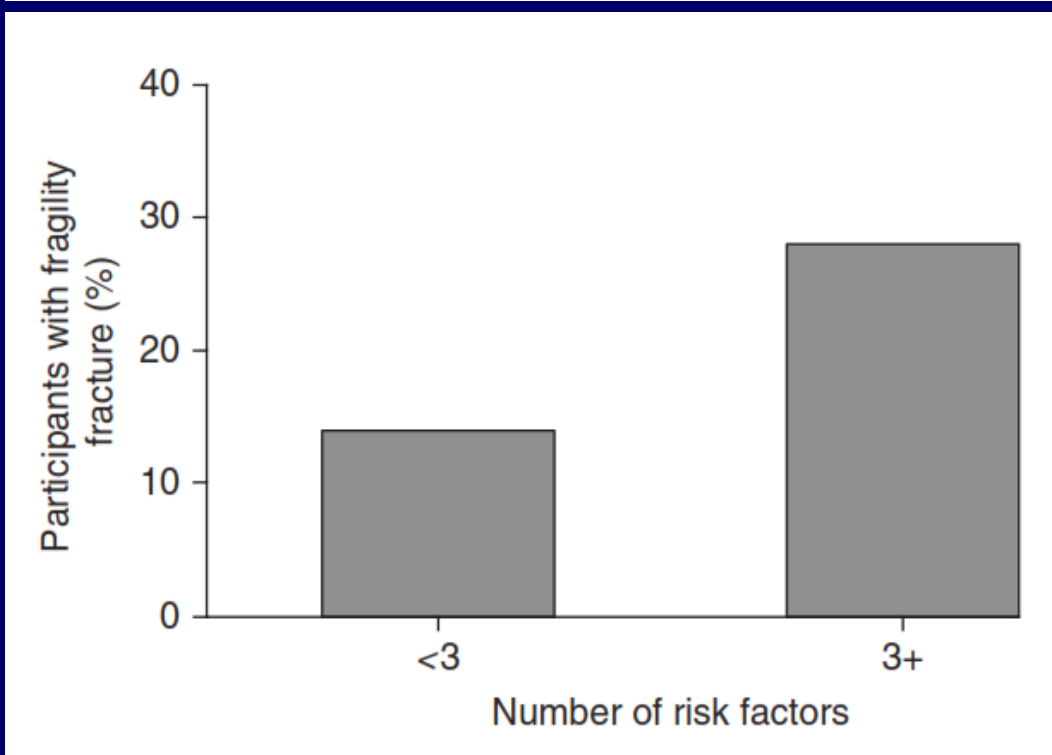
Anna Jakobsen¹
Stig Andersen^{1,2}

	Men		Women				p ^a	p ^b		
	Aged 54–55 years		Aged 54–55 years		Aged 63–65 years				Aged 69–77 years	
	n	%	n	%	n	%			n	%
Family history										
Yes	4	8.9	4	11.4	6	16.2	11	22.0	ns	ns
No	41	91.1	31	88.6	31	83.8	39	78.0		
Smoker										
Present	19	42.2	20	60.6	16	41.0	21	35.0	ns	0.022
Past	17	37.8	12	36.4	16	41.0	21	35.0		
Never	9	20.0	1	3.0	7	18.0	18	30.0		
Alcohol units/week										
<15	37	82.2	28	77.8	30	76.9	52	89.7	ns	ns
15+	8	17.8	8	22.0	9	23.1	6	10.3		
Other diseases										
Yes	5	11.1	4	11.1	3	7.5	9	15.0	ns	ns
No	40	88.9	32	88.9	37	92.5	51	85.0		
Steroid daily										
Yes	1	2.2	1	2.8	0	0.0	0	0.0	na	na
No	44	97.8	35	97.2	38	100	52	100		
Other bone affecting drugs										
Yes	1	2.2	0	0.0	0	0.0	1	1.8	na	na
No	44	97.8	35	100	38	100	54	98.2		
Sun exposure										
Often	3	6.7	3	8.3	2	5.3	6	11.8	ns	0.003
Some	34	75.5	31	86.1	30	78.9	26	51.0		
Limited	8	17.8	2	5.6	6	15.8	19	37.2		
Dairy products										
Daily	29	64.4	26	72.2	24	63.2	41	73.2	ns	ns
Weekly	7	15.6	6	16.7	5	13.2	9	16.1		
Rarely	9	20.0	4	11.1	9	23.6	6	10.7		
Age at menopause										
<45	na		6	18.8	7	25.0	4	11.4	na	ns
45+	na		26	81.2	21	75.0	31	88.6		

Clinical risk factors for osteoporosis are common among elderly people in Nuuk, Greenland

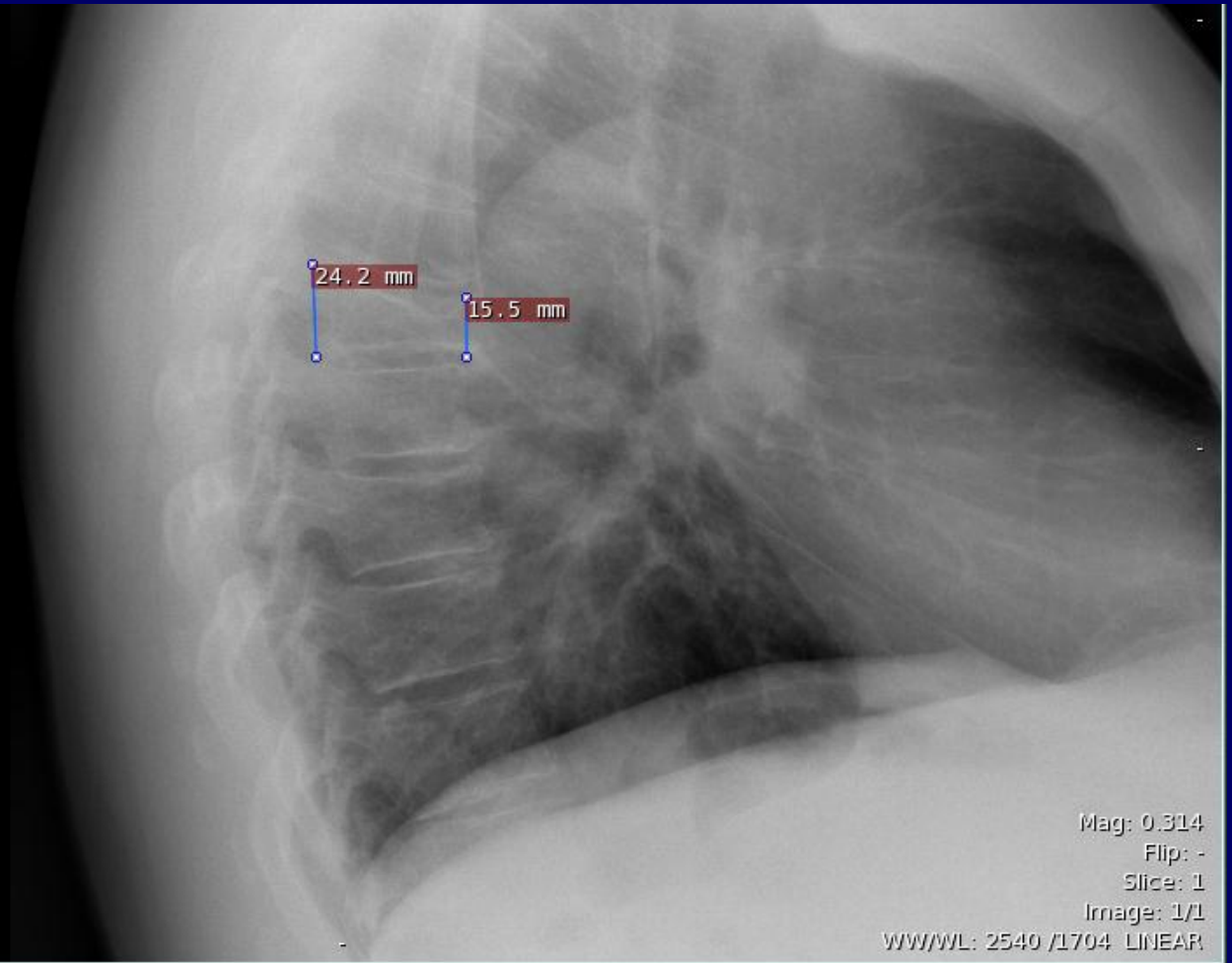
Anna Jakobsen^{1,2*}, Peter Laurberg³, Peter Vestergaard^{3,4} and Stig Andersen^{1,2,5}

Int J Circumpolar Health 2013, **72**: 19596 - <http://dx.doi.org/10.3402/ijch.v72i0.19596>



Osteoporotic fractures in Greenland?

MI.NJA.0E129501
Thorax
25-07-2011
11:44:54



Series: L0034 Thorax lat

BodyPart: -
Laterality: -
Comments: -

Mag: 0.314
Flip: -
Slice: 1
Image: 1/1

WWWL: 2540 /1704 LINEAR

Osteoporotic fractures

in Greenland?

Vertebral fractures in Greenland

Vibeke N Sørensen, Piotr Voitjek, Dorte Jørgensen, Stig Andersen
Arctic Health Research Centre, Aalborg University Hospital, Denmark
Dept. of Internal Medicine, Dept. of Radiology, Queen Ingrid's Hospital, Nuuk, Greenland



Background

- Lack of sun and 66% smokers in Greenland influence the risk of osteoporotic fractures.
- BMD is similar in Inuit and Caucasians.
- Evaluation of vertebral fractures among Inuit is lacking.
- Vertebral fractures may be diagnosed from lateral chest radiographs.
- Chest radiographs are frequently done and readily available.

Aims

- To determine the occurrence of vertebral fractures among patients admitted to Queen Ingrid's Hospital in Nuuk, Greenland, compared to an outpatient population, and

- to estimate the need for osteoporosis treatment.

Methods

Evaluation of all lateral chest radiographs performed at Queen Ingrid's Hospital in Nuuk, Greenland, over a three month period.

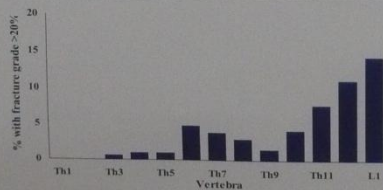
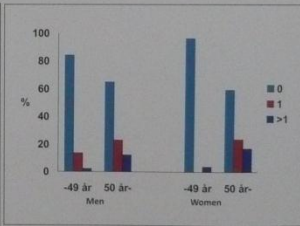
Fractures were assessed by measurement of vertebral body heights at the anterior, middle and posterior regions.

Results

Table 1
Descriptives of consecutive chest radiographs performed over a three month period at Queen Ingrid's Hospital in Nuuk, Greenland.

	All n (%)	Men n (%)	Women n (%)	P*
Number of radiographs	293	118 (58.1)	85 (41.9)	0.002
vertebrae evaluated	1869	1047 (56.0)	822 (44.0)	
Age				0.19
30-49 years	70 (34.8)	44 (37.3)	26 (30.6)	
50-69 years	105 (51.7)	61 (51.7)	44 (51.8)	
70-89 years	26 (13.8)	13 (11.0)	15 (17.6)	
Referring Department				0.64
General Medicine	65 (32.0)	38 (32.2)	27 (31.7)	
Internal Medicine	94 (46.3)	59 (50.0)	35 (41.2)	
Surgery	44 (21.7)	21 (17.8)	23 (27.1)	

* Chi-squared test
* More vertebrae eligible for evaluation in women than in men (Average, women 9.7 vs men 8.9)



Logistic regression	B	OR	95% CI
Gender	0.96	0.98	(0.8-1.0)
Age	0.000	0.21	(0.1-0.4)
Referring Department	0.33	0.66	(0.3-1.5)

Conclusions

Vertebral deformities were commonly detected on lateral chest radiographs in this population.

The occurrence increased with age.

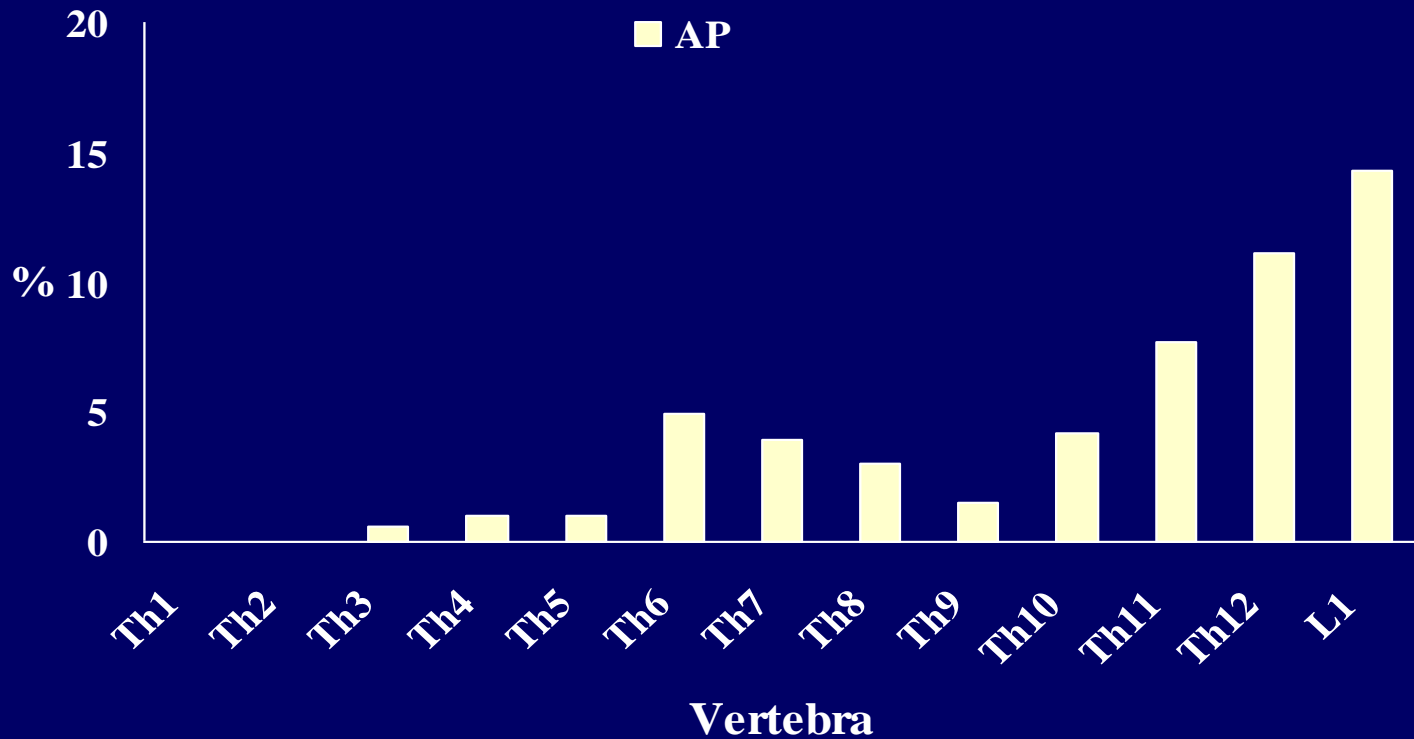
They were detected in about one third of men and half of old women aged 70 years and above.

A mere 0.2% of the population in the capital Nuuk received treatment for osteoporosis.

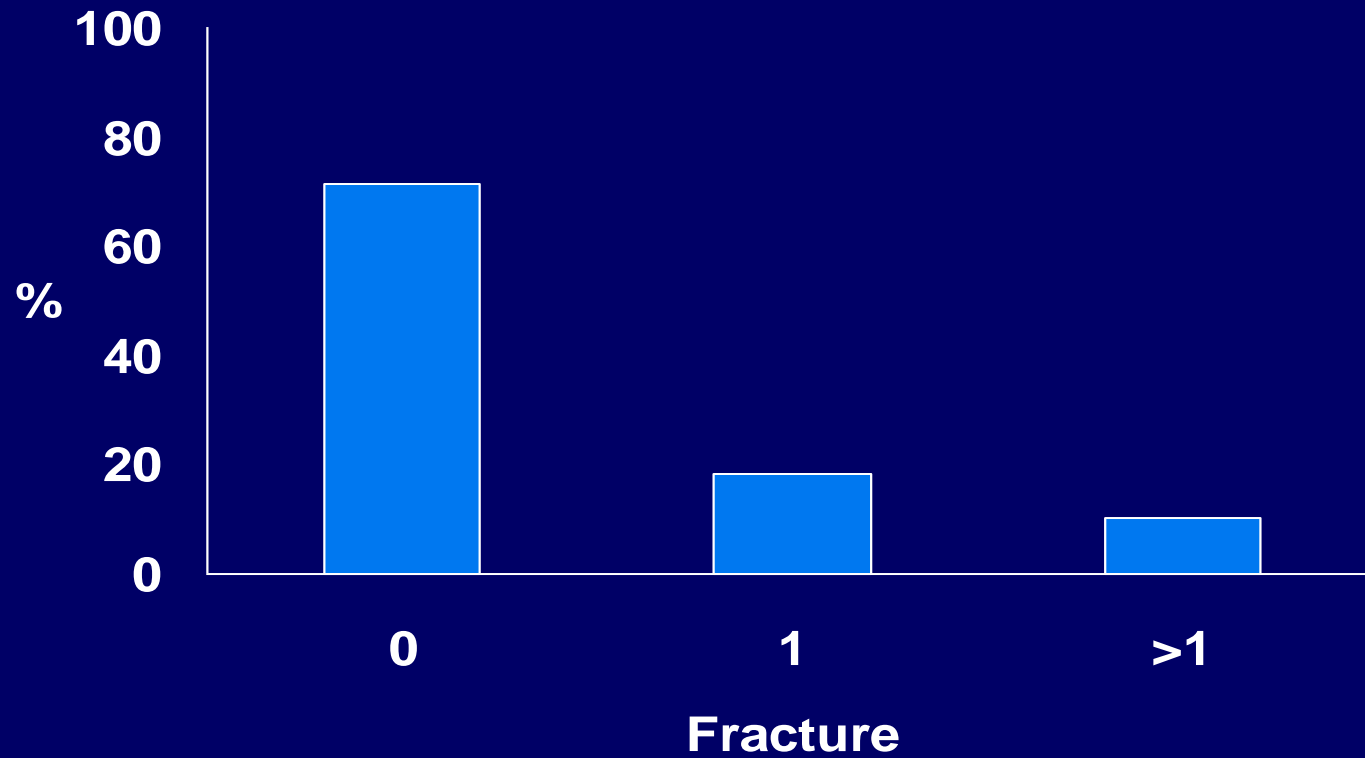
All lateral chest x-rays
over 3 months:

- 5.607 measures
- 1.869 vertebrae
- 203 x-rays

Vertebral deformity >25%



Vertebral deformity >25%



Body proportions and Arctic habitat



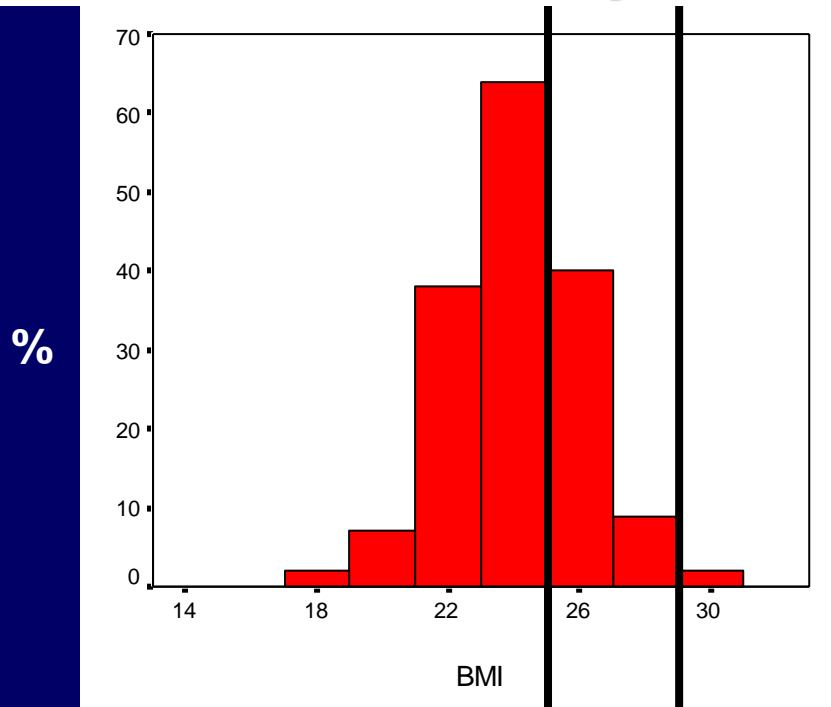
- Cold

- decreases growth of the limbs

CLINICAL STUDY

Gender diversity in developing overweight over 35 years of Westernization in an Inuit hunter cohort and ethno-specific body mass index for evaluation of body-weight abnormalities

Stig Andersen^{1,2}, Gert Mulvad³, Henning Sloth Pedersen³ and Peter Laurberg²



Inuit specific BMI:
(90 percentiles)

Men 20.2-27.9

Women 17.9-27.7

WHO def. Inuit def.

Lipids/BMI in Inuit & non-Inuit in Canada

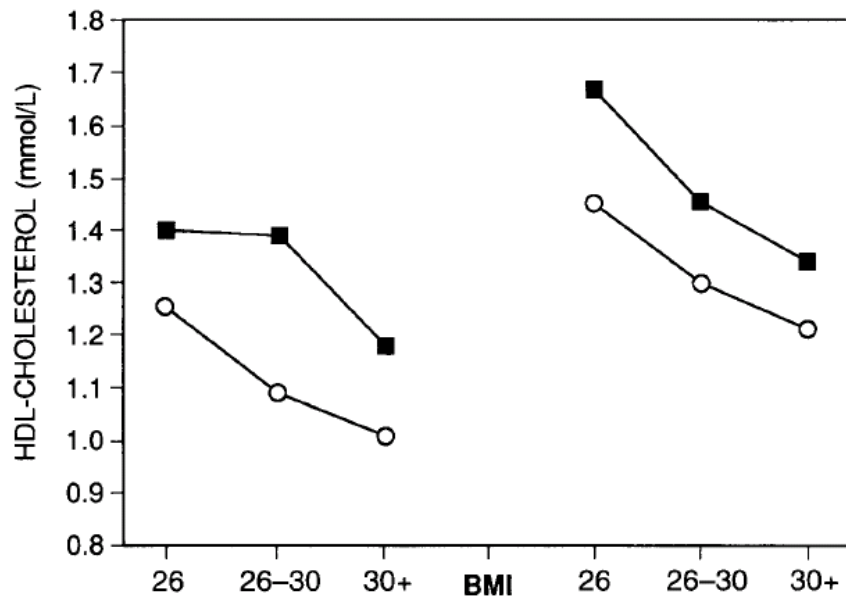
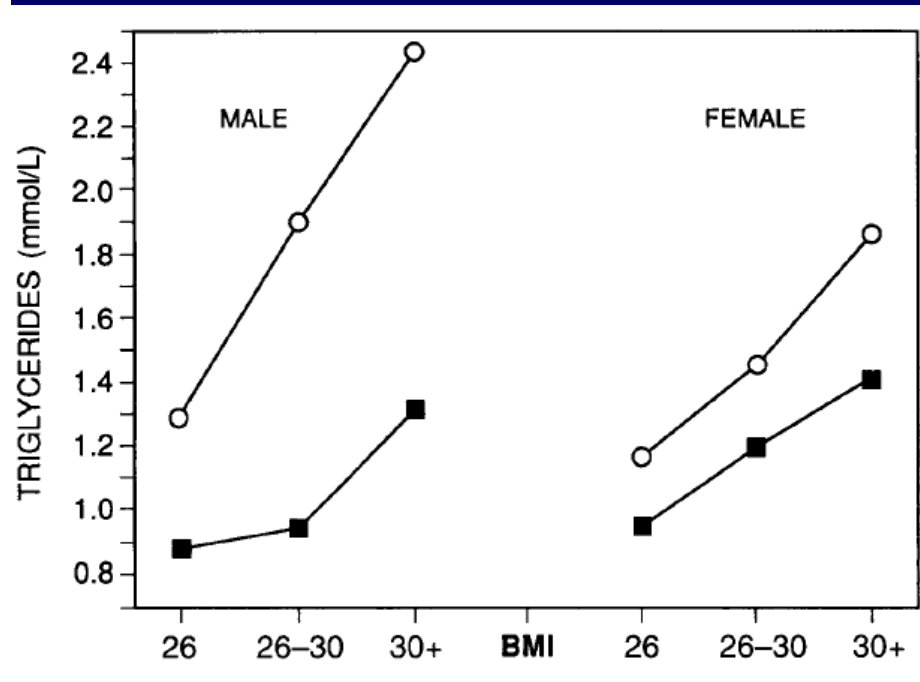


Figure 5. Age-adjusted sex-specific mean TG and HDL levels by categories of body mass index (BMI) for Keewatin Inuit (squares) and Province of Manitoba (circles).

	HDL	Triglycerider
Women	$y = -0.08x + 3.8$	$y = 0.11x - 2.0$
	$y = -0.06x + 3.0$	$y = 0.18x - 3.5$
Men	$y = -0.06x + 2.9$	$y = 0.11x - 2.0$
	$y = -0.06x + 2.8$	$y = 0.28x - 6.1$



ETHNICITY INFLUENCES BMI AS EVALUATED FROM REPORTED SERUM LIPID VALUES IN INUIT AND NON-INUIT: RAISED UPPER LIMIT OF BMI IN INUIT?

Ethnicity & Disease, Volume 23, Winter 2013

Paneeraq Noahsen, BA; Stig Andersen, MD, PhD

			BMI-ratio ^a	BMI	
			Inuit/Non-Inuit	Inuit ^b	Higher in Inuit ^c
Jørgensen et al ^d	Men	HDL	1.12	27.62	10%
		Triglycerides	1.16	28.64	15%
Young ^e	Women	HDL	1.05	26.54	6%
		Triglycerides	1.08	27.18	9%
	Men	HDL	1.14	28.36	13%
		Triglycerides	1.12	26.36	5%
Women	HDL	1.09	27.93	12%	
	Triglycerides	1.11	27.27	9%	

CLINICAL STUDY

Thyroid hyperactivity with high thyroglobulin in serum despite sufficient iodine intake in chronic cold adaptation in an Arctic Inuit hunter population

Stig Andersen^{1,2}, Kent Kleinschmidt², Bodil Hvingel³ and Peter Laurberg^{1,4}

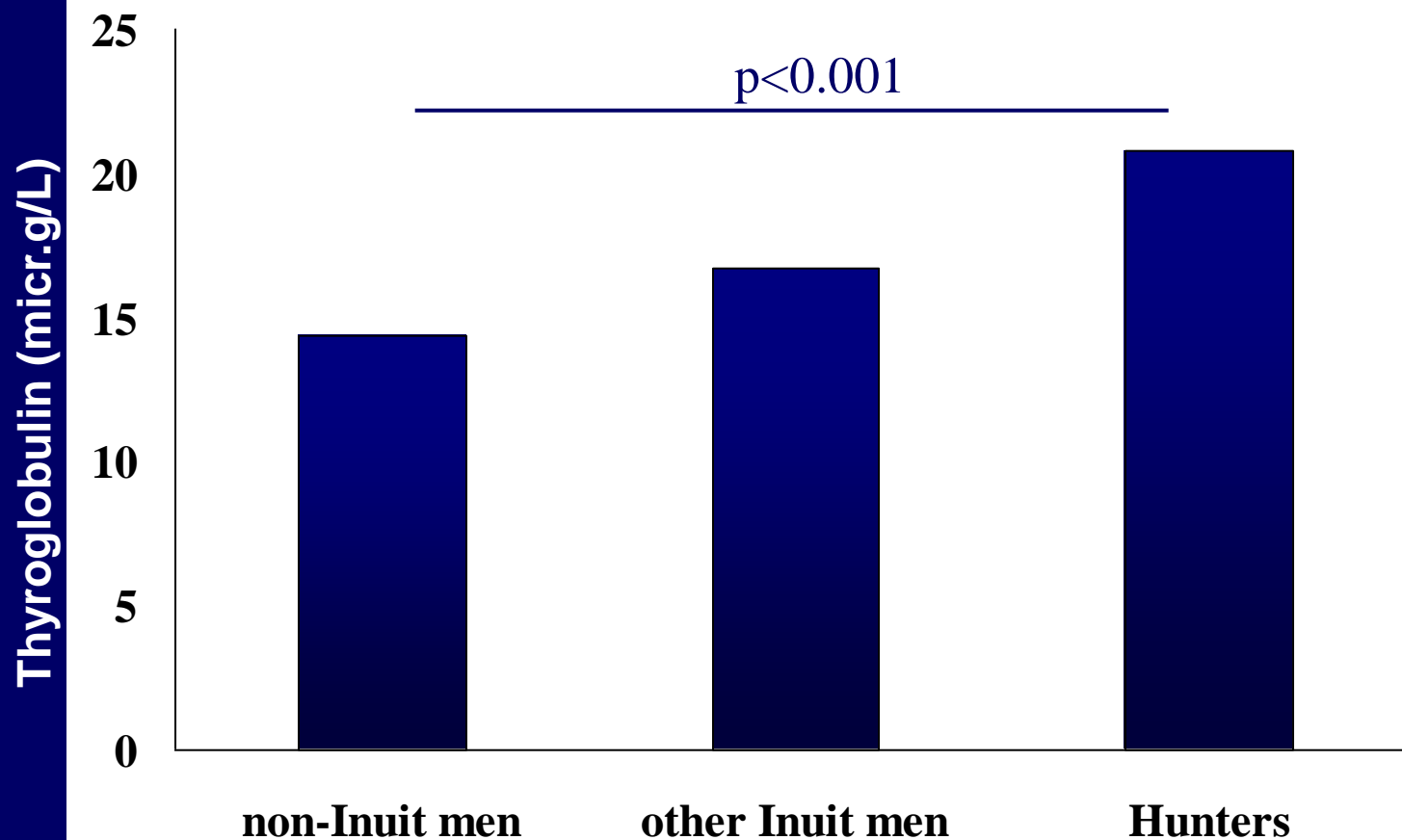
Body heater

Non-shivering thermogenesis

CLINICAL STUDY

Thyroid hyperactivity with high thyroglobulin in serum despite sufficient iodine intake in chronic cold adaptation in an Arctic Inuit hunter population

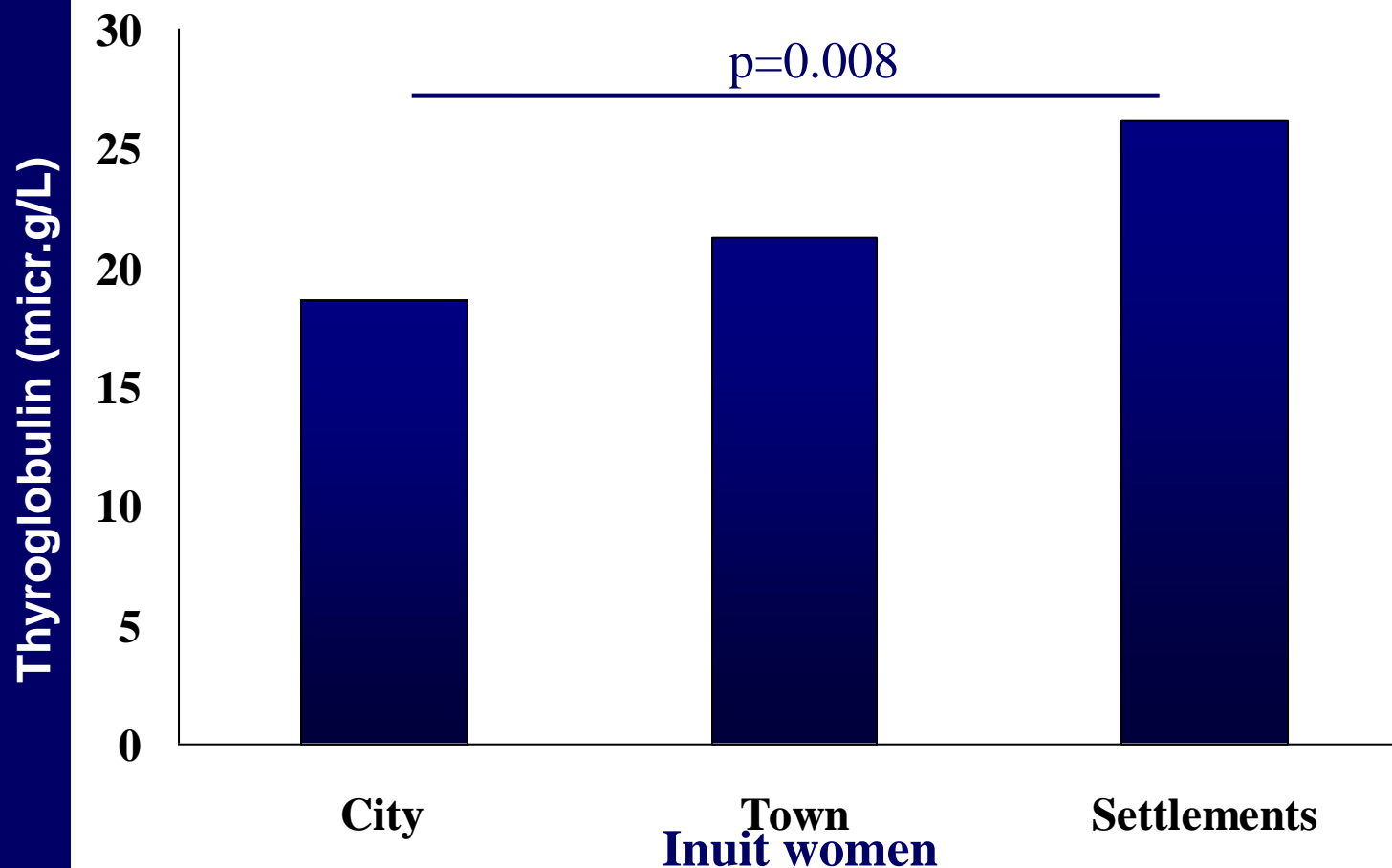
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CLINICAL STUDY

Thyroid hyperactivity with high thyroglobulin in serum despite sufficient iodine intake in chronic cold adaptation in an Arctic Inuit hunter population

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Kalaalerpasuit tingullulertanngillat

Nakorsannorniartuni ilinniartuq Kalaallit Nunaanneersoq misissuinermit, silarsuarmi tamarmi tingulluummik napparsimalersartunut iluaqutaasinnaas-sagunartumut peqataavoq

All, Noah Mølgaard
Nuts. M. Berthelsen

Tingukut aseruttoorluni nappaat hepatitis B, napparsimalersut toqussutigisinnaasartagaat, kalaalerpasuit nappaatigilersanngilaat.

Center for Grønlandsforskningimi Ålborgimiittumi nakorsaq nakorsannorniartuni ilinniartuq inuusuttoq Kalaallit Nunaanneersoq aapparalugu kalaallit Danmarkimut nuukkaangata tamanna allannortarnersoq paasiarlugu misissuisussanngorpoq.

Kalaallit Århusimi Ålborgmilu najugallit 5-600-it misaanniittut misissortikkiartoqqullugit aggersarneqassaput, nakorsallu aassiuineq quasiuineq apeqqutillu allakkatigut akissat atorlugit hepatitis B pillugu paasisutissanik katersuissapput.

Nakorsap ukiuni arlalinni Kalaallit Nunaanni sulisimasup Stig Andersenip paasisimavaa kalaallit hepatitis B-mik napparsimalersanngitsut.

Tamannalu uisaallannartuovoq, tasami hepatitis S tunillannaqisoq nappaatigilersaanni tamanna tingukut kræfteqalemmermik, tingup atorunnarneranik toqunermillu kinguneqarsinnaasarmat.

Ilisimasat nutaat

– Kalaallinik Kalaallit Nunaanni misissuinikuuvugut, kalaallit Danmarkimut nuullutik avatangisitit allannortik-

kaangatigit tamanna allannortarnersoq paasiarlugu misissuisussanngortoq Stig Andersen oqaluttarpoq.

– Naluarput soq kalaallit naak timinni virusimi silarsuarmi inuppassuit napparsimalersutigisartagaannik peqaraluartik hepatitis B-mik napparsimalersannginnersut.

– Neriuppugut ilisimasanik nutaanik, tingulluummik nappaatilinnut iluaqutaasinnaasumik pissarsisinnaassalluta.

– Soq kalaallit hepatitis B-mik napparsimalersannginnersut nassuiarsinnaanngilara.

– Isummanik assiginningsunik saqqummiussuilinningsinnini paasisutissanik katersueqqaarutta pitsaanerussiaaq, nakorsaq Stig Andersen Ålborgimi Center for Grønlandsforskningimeersoq oqarpoq.

Kalaallit misissuisartut

Stig Andersenip ikiortigissavaa nakorsannorniartuni ilinniartuq Karsten Fleischer Rex, misissuinerup ingerlanerani Århus Universitetimi atuannikkallartussaq.

– Kalaallit inuusuttut ilisimatutut misissuinermit ilinniartissavagut. Tamattumik Karsten Fleischer Rex missueqataajumanoersoq aperinikuuara. Ilisimatutut misissuineq nakorsatut sulinerup ilagaa pingaarutilik.

– Uangalu neriiuppunga hepatitis B-mik misissuineq sulii ukiopassuarmi



Nakorsaq Stig Andersen nakorsannorniartunilu ilinniartuq Karsten Fleischer Rex soq kalaallit tingulluummik napparsimalersannginnersut paasiarlugu misissuisapput.

Læge Stig Andersen og lægestuderende Karsten Fleischer Rex undersøger, hvorfor mange grønlændere ikke bliver syge af smitsom leverbetændelse.

ingerlagallarumaartoq.

– Kalaallit Kalaallit Nunaanniittut kitaamiorpalaartunik nerisaqaraluttuinnarput. Taamaattumik pissanganarpoq takussallugu tamanna aamma tingukut aseruttoormermit nappaateqalersarnermut sunniuteqarumaarnersoq, Stig Andersen oqarpoq.

Kalaallinik peqataasoqassaaq

Kalaallit Ålborgip Århusillu eqqaanni najugallit misissuinermit peqataaqqullugit aggersarneqarsimapput.

Karsten Fleischer Rex aassiuineq, quassiuineq apeqqutillu allakkatigut akissat atorlugit misissuisaaq.

– Neriuppugut kalaallit 5-600-it misaanniittut misissuinitinnut peqataajumaartut. Naatsorsuutigarpullu misissuinerput januarip naanerani naammassimajumaarlutigu, taamanik kussamut misissuisimanerput tunngavigalugu allaaserisaqartussaassagatta, Karsten Fleischer Rex oqarpoq.

Karsten Fleischer Rex Maniitsumi inunngorsimasoq 2000-imi Danmarkimut atuariartornissami tungaanut ukiopassuarni Nuummi najugaqarsimavoq.

Nakorsatut ilinniarnini naammassiguniuk sungiusarluni Kalaallit Nunaannut suliarternissani naatsorsuutigaa.

Population-based comparative epidemiological survey of hepatitis B, D, and C among Inuit migrated to Denmark and in high endemic Greenland

Scandinavian Journal of Gastroenterology. 2012; 47: 692–701

KARSTEN FLEISCHER REX^{1,2}, HENRIK B KRARUP³, PETER LAURBERG⁴ & STIG ANDERSEN^{1,2}

Benign course of long-standing hepatitis B virus infection among Greenland Inuit?

Scandinavian Journal of Gastroenterology, 2008; 43: 334–343

HENRIK BYGUM KRARUP^{1,2}, STIG ANDERSEN^{3,4}, POUL HENNING MADSEN¹, HENRIK OKKELS¹, BODIL HELENIUS HVINGEL⁵ & PETER LAURBERG⁴

Geographical clustering and maintained health in individuals harbouring the mutation for Greenland familial cholestasis: A population-based study

Scandinavian Journal of Gastroenterology, 2006; 41: 445–450

STIG ANDERSEN^{1,2}, HENRIK OKKELS³, HENRIK KRARUP³ & PETER LAURBERG²



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Atherosclerosis

journal homepage: www.elsevier.com/locate/atherosclerosis



Low occurrence of ischemic heart disease among Inuit around 1963 suggested from ECG among 1851 East Greenland Inuit

Marie Kjærgaard^a, Stig Andersen^{a,b,*}, Mads Holten^a, Gert Mulvad^c, Jens Jørgen Kjærgaard^a

^a Department of Internal Medicine

^b Department of Endocrinology

^c Primary Health Care Clinic



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journal homepage: www.elsevier.com/locate/atherosclerosis



Frequent left ventricular hypertrophy independent of blood pressure in 1851 pre-western Inuit[☆]

Stig Andersen^{a,b,*}, Marie Kjærgaard^a, Marit Eika Jørgensen^a, Gert Mulvad^c, Jens Jørgen Kjærgaard^a

^a Department of Internal Medicine

^b Arctic Health Research Center

^c Primary Health Care Clinic



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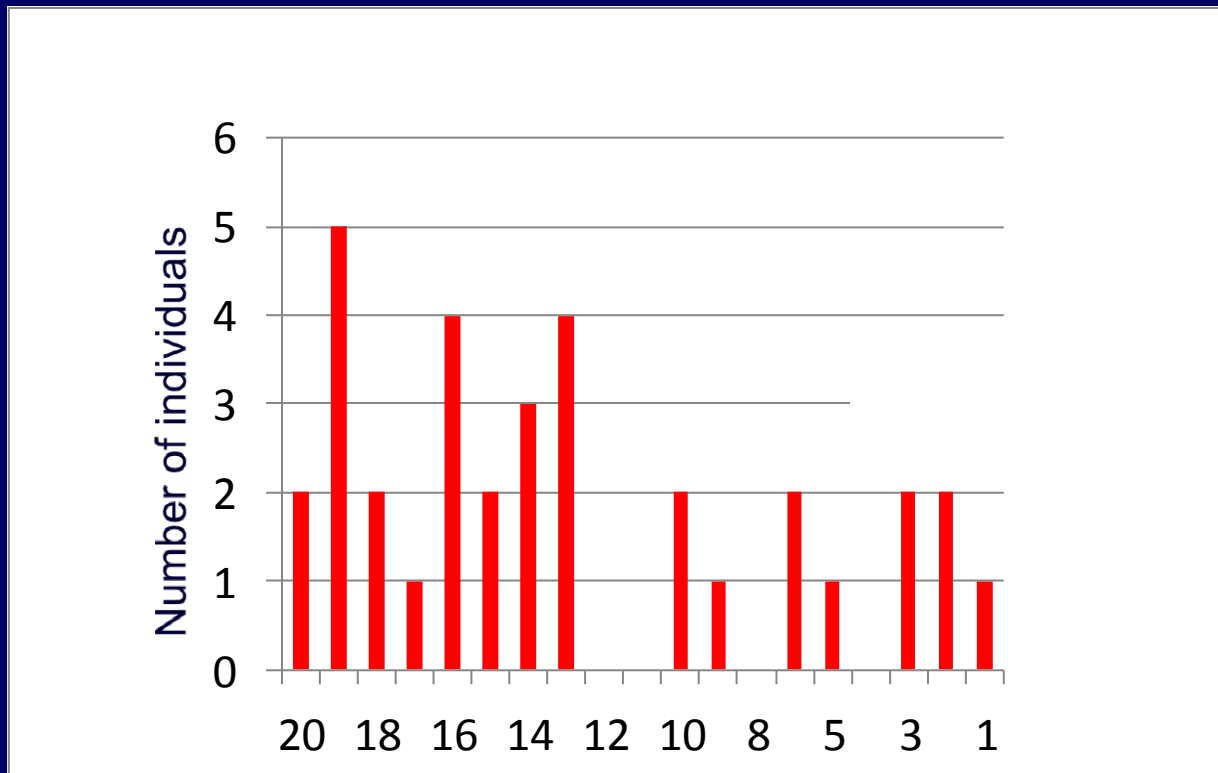
journal homepage: www.elsevier.com/locate/atherosclerosis



Intake of traditional Inuit diet vary in parallel with inflammation as estimated from YKL-40 and hsCRP Inuit and non-Inuit in Greenland

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Physical ability among the old



Independent of help with activities of daily living

Dependend on help with activities of daily living

Arctic Health Research Centre

- Stig Andersen Iodine-Thyroid-Cold-Vit.D
- Anna Jakobsen Osteoporose in Inuit
- Vibeke Sørensen Vertebral fractures
- Hanne Lynge Rex Vitamin D in Greenland
- Paneeraq Noahsen BMI & Body Build
- Karsten FleischerRex Hepatitis
- Thomas Olsen Aged in Greenland
- Marie Kjærgaard ECG & Blood Pressure
- Louise Schæbel Inuit diet & inflammation
- & Peter Laurberg