

# INCIDENCE AND MORTALITY OF CANCER IN GREENLANDIC INUIT 1983-2012

- INCLUDING A COMPARISON WITH THE NORDIC COUNTRIES.

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## GREENLAND

Population 56,000 (2013)

85% Greenlandic Inuit

Self-government within  
The Kingdom of Denmark



## Overview

- Background
- Methods
- Results
- Conclusions
- Collaborators

## Background 1

- Cancer was uncommon in Greenland during the first half of the 20<sup>th</sup> century
- Changes in dietary habits => ↑Obesity (population based survey 2014)
- Reports on cancer incidence in Greenland:
  - 1969-1988 (Nielsen, 1996)
  - 1973-1997 (Friberg, 2003)
- Increasing cancer incidence reported for some cancers

## Background 2

- What is the cancer pattern?
- Incidence of cancer and changes over time?
- Mortality of cancer and changes over time?
- Comparison with Nordic countries

## Methods 1

- Danish Cancer Register – all cases of cancer from 1968
- National Cause of Death Register – all causes of death from 1983
- Nordic Cancer Statistics Database – NORDCAN – Greenland included since 2014 ([ancr.nu](http://ancr.nu))
- Persons living in Greenland – no data on descent
- Age standardized rates for the world (ASR-W)

## Methods 2

- Data on incidence and mortality for the years 1983-2012
- All cancers except non-melanoma skin cancer
- Incidence rate ratios (IRR) compared to Nordic countries
- Mortality rate ratios (MRR) compared to Nordic countries
- Estimated annual percent change (EAPC)  
(by fitting a simple regression model to the log of the ASR)
- Compiled into 11 organ groups due to a small population

## Methods 3

Definition of organ groups.

	ICD-10	NORDCAN entities
Lip, oral cavity and pharynx	C00-14\C10.1	Lip, oral cavity and pharynx
Respiratory organs	C30-34 + C10.1+C38.4+C45.0	Nose, Larynx, Lung, Pleura
Digestive organs	C15-25	Oesophagus, stomach, small intestine, colon, Rectum and anus, liver, gallbladder, Pancreas
Urinary tract	C64-68 +D09.1+D30.1-9+D41.1-9	Kidney, bladder etc
Female genital	C51-58	Cervix uteri, corpus uteri, Uterus other, Ovary etc, other female genital organs
Male genital	C60-63	Penis etc, prostate, testis
Breast	C50	Breast
Melanoma of skin	C43	Melanoma of skin
Lymphoma and leukaemia	C81-85+C90-96	Hodgkin and non-Hodgkin lymphoma, multiple myeloma, leukaemia
Other specified sites	-	Other specified, bone, soft tissue, eye, brain and central nervous system, thyroid
Unknown	C26+C39+C76-80+C97+D47	Unknown and unspecified

## Results 1

1983-2012

	No. of cancer cases	No. of deaths
Women	2,170	1,431
Men	2,163	1,586
<b>Total</b>	<b>4,333</b>	<b>3,017</b>

## Results 2

Incidence and mortality, for organ groups, 1983-2012, women.

Organ groups	Incidence (no.)	Mortality (no.)
Lip, oral cavity and pharynx	106	76
Respiratory organs	415	409
Digestive organs	479	372
Urinary tract	59	40
Female genital organs	415	189
Male genital organs	-	-
Breast	314	123
Melanoma of skin	12	1
Lymphoma and leukemia	67	33
Other specified sites	137	40
Unknown	166	148

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## Results 3

Incidence and mortality, for organ groups, 1983-2012, men.

Organ groups	Incidence (no.)	Mortality (no.)
Lip, oral cavity and pharynx	212	132
Respiratory organs	631	591
Digestive organs	659	492
Urinary tract	124	64
Female genital organs	-	-
Male genital organs	118	37
Breast	0	0
Melanoma of skin	12	5
Lymphoma and leukemia	117	55
Other specified sites	127	44
Unknown	163	166

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## Results 4

IRR and MRR (relative to the Nordic countries), for organ groups, 1983-2012, women.

Organ groups	IRR	MRR
Lip, oral cavity and pharynx	4.0	10.1
Respiratory organs	3.3	4.1
Digestive organs	1.6	2.0
Urinary tract	0.8	1.5
Female genital organs	1.4	2.0
Male genital organs	-	-
Breast	0.5	0.9
Melanoma of skin	0.1	0.1
Lymphoma and leukemia	0.5	0.6
Other specified sites	0.8	0.9
Unknown	2.9	3.8

## Results 4

IRR and MRR (relative to the Nordic countries), for organ groups, 1983-2012, women.

Organ groups	IRR	MRR
Lip, oral cavity and pharynx	4.0	10.1
Respiratory organs	3.3	4.1
Digestive organs	1.6	2.0
Urinary tract	0.8	1.5
Female genital organs	1.4	2.0
Male genital organs	-	-
Breast	0.5	0.9
Melanoma of skin	0.1	0.1
Lymphoma and leukemia	0.5	0.6
Other specified sites	0.8	0.9
Unknown	2.9	3.8

## Results 5

IRR and MRR (relative to the Nordic countries), for organ groups, 1983-2012, men.

Organ groups	IRR	MRR
Lip, oral cavity and pharynx	3.2	6.1
Respiratory organs	2.3	2.7
Digestive organs	1.5	1.9
Urinary tract	0.6	0.9
Female genital organs	-	-
Male genital organs	0.2	0.3
Breast	0.0	0.0
Melanoma of skin	0.1	0.2
Lymphoma and leukemia	0.5	0.6
Other specified sites	0.8	0.7
Unknown	2.6	4.1



## Results 5

IRR and MRR (relative to the Nordic countries), for organ groups, 1983-2012, men.

Organ groups	IRR	MRR
Lip, oral cavity and pharynx	3.2	6.1
Respiratory organs	2.3	2.7
Digestive organs	1.5	1.9
Urinary tract	0.6	0.9
Female genital organs	-	-
Male genital organs	0.2	0.3
Breast	0.0	0.0
Melanoma of skin	0.1	0.2
Lymphoma and leukemia	0.5	0.6
Other specified sites	0.6	0.7
Unknown	2.6	4.1

## Results 6

EAPC for incidence and mortality rates, for all cancers except non-melanoma skin cancer, 1983-2012.

	Incidence rate (ASR-W)	Mortality rate (ASR-W)
EAPC (Women)	0.83% (CI: 0.10-1.57)	0.32% (CI: -0.32-0.97)
EAPC (Men)	0.69% (CI: 0.15-1.23)	-0.12% (CI: -0.33-0.59)

IRR and MRR, relative to the Nordic countries, for all cancers except non-melanoma skin cancer, 1983-2012.

	IRR	MRR
Women	1.04 (CI:0.99-1.09)	>>1
Men	0.96 (CI: 0.92-1.01)	>>1

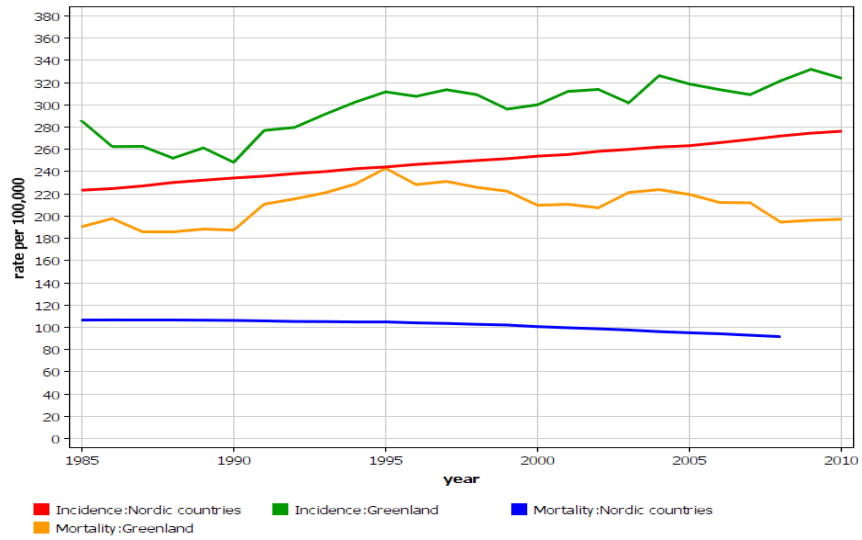
## Conclusions 1

- The Greenlandic population has a different distribution of cancer compared to the Nordic countries:
  - ↑ lip, oral cavity and pharynx; respiratory organs; digestive organs; female genital organs; unknown; unspecified and ill-defined sites
  - ↓ melanoma; lymphoma and leukemia; urinary tract; male genital organs; breast; other specified sites
- Possible risk factors:
  - Diet and fertility pattern (Breast); Tobacco (Respiratory); Alcohol (Digestive/Urinary); Skin type and UV-exposure (melanoma of skin)

## Conclusions 2

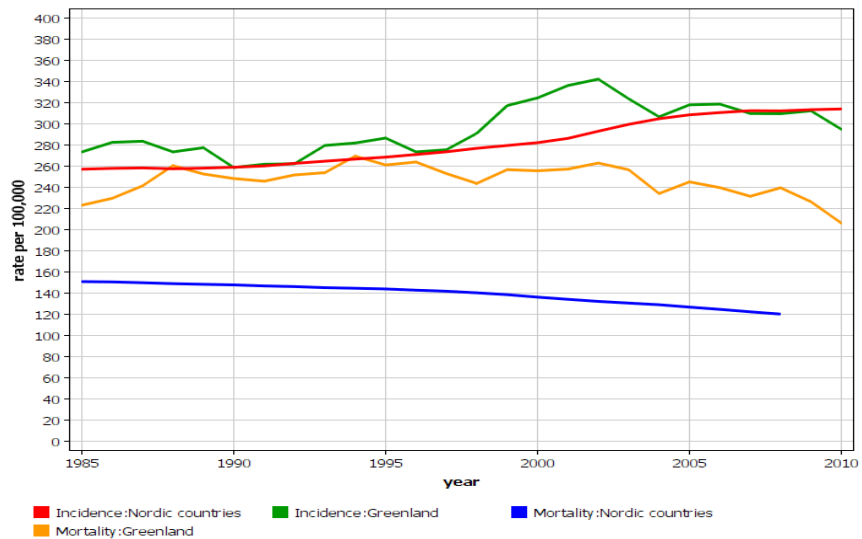
- The incidence rate has been increasing over time
- The mortality rate has been stable during the time period
- The cancer risk (IRR) has been stable over time and at the same level as the Nordic countries
- The mortality risk (MRR) has been increasing over time compared to the Nordic countries

All sites but non-melanoma skin cancer  
ASR (World), Female age 0-85+



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All sites but non-melanoma skin cancer  
ASR (World), Male age 0-85+



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## Conclusions 3

- Proportion of histologically verified cancers is 12-14% lower in Greenland compared to Denmark
- Lack of registration of all new cases of cancers => work on increasing the completeness of registration
- These data underline a need to focus on decreasing the mortality of cancer in Greenland

## Collaborators

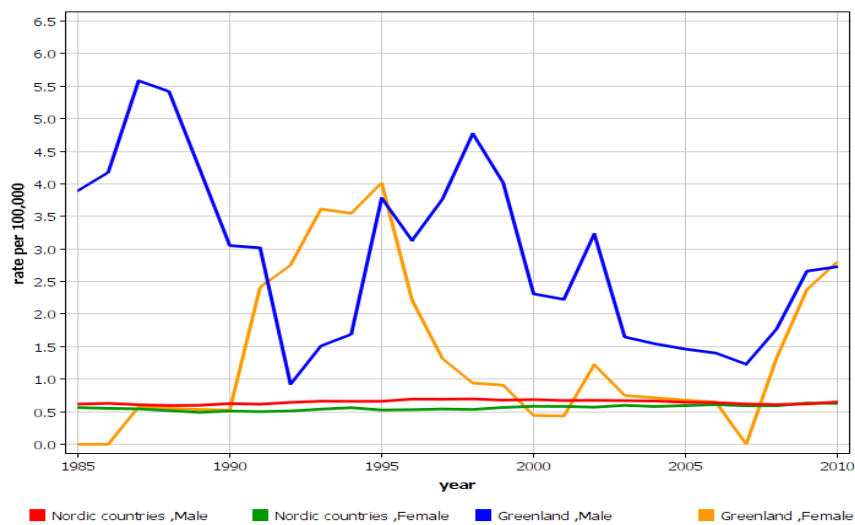
- **Henrik Trykker**, Chief medical doctor, Nuuk, Greenland.
- **Gerda Engholm**, Senior Statistician, Department of Documentation & Quality, Danish Cancer Society, Denmark.
- **Niels Christensen**, Programmer, Department of Documentation & Quality, Danish Cancer Society, Denmark.
- **Hans Storm**, MD, Medical Director (Vice CEO), Danish Cancer Society, Denmark.
- **Peter Bjerregaard**, MD, Professor, National Institute of Public Health, Copenhagen, Denmark.

# Qujanaq (= Thank you)

➤ Comments

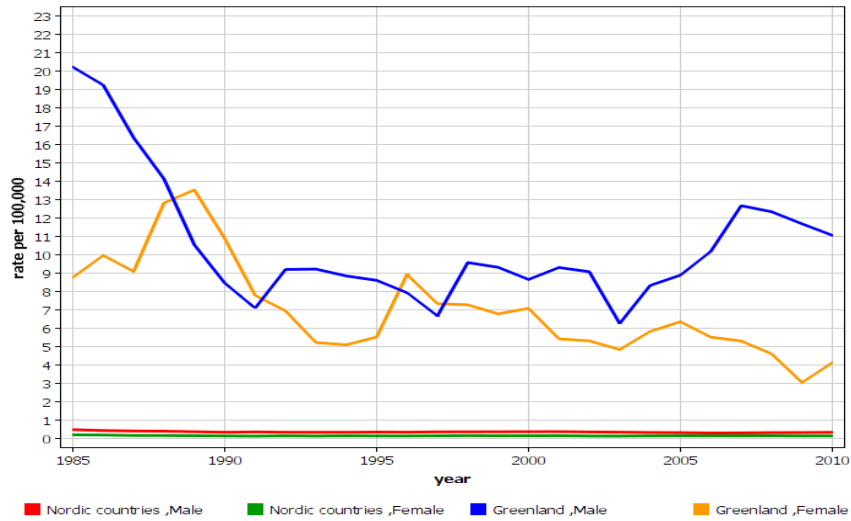
➤ Questions

Salivary glands  
Incidence: ASR (World) age 0-85+



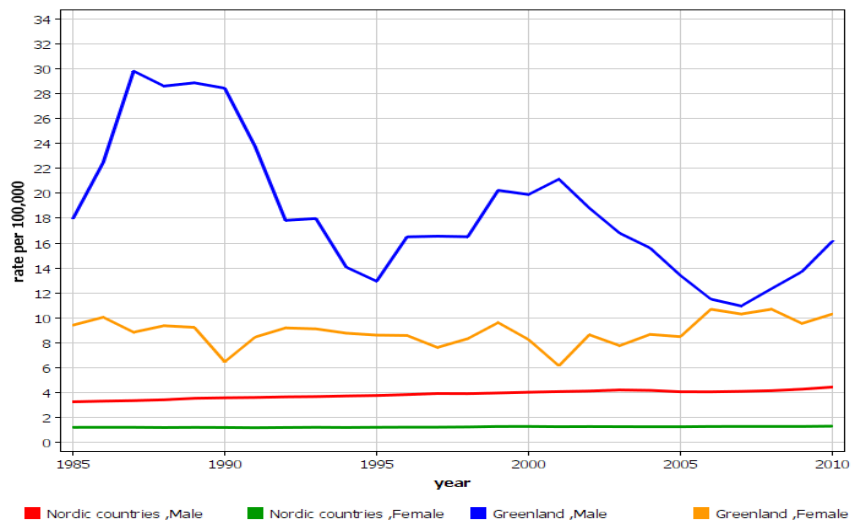
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### Nasopharynx Incidence: ASR (World) age 0-85+



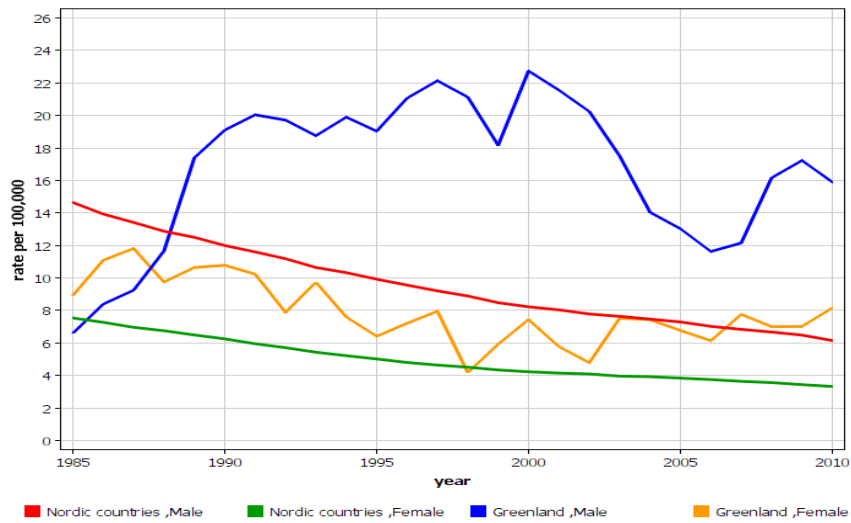
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### Oesophagus Incidence: ASR (World) age 0-85+



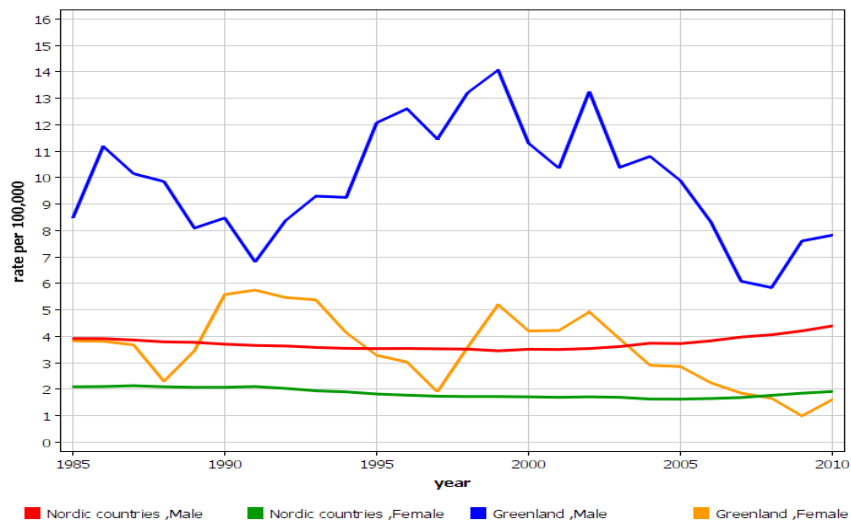
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### Stomach Incidence: ASR (World) age 0-85+



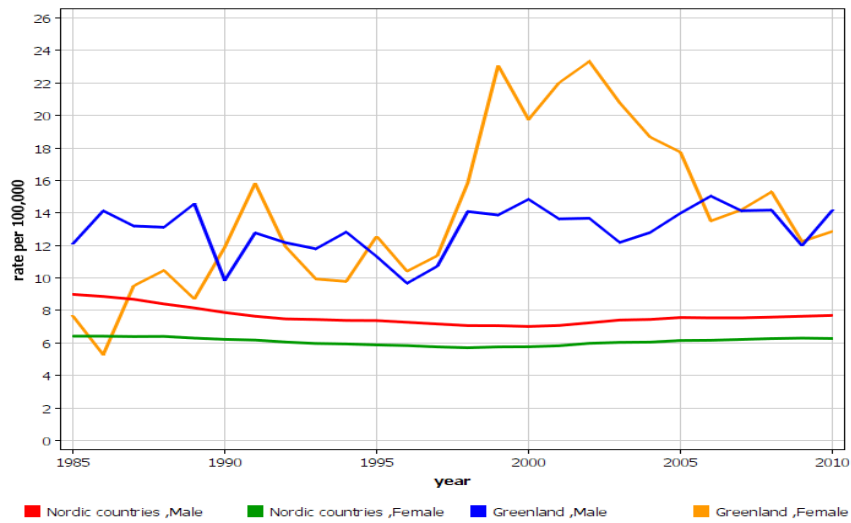
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### Liver Incidence: ASR (World) age 0-85+



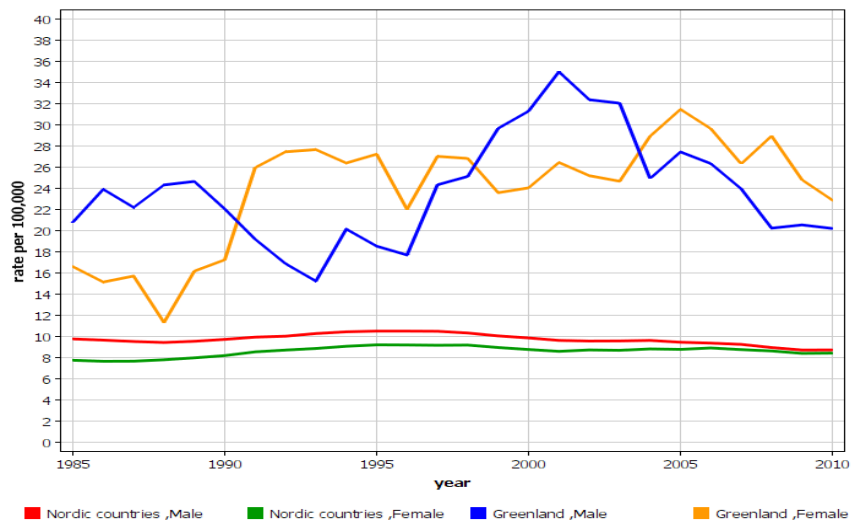
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### Pancreas Incidence: ASR (World) age 0-85+



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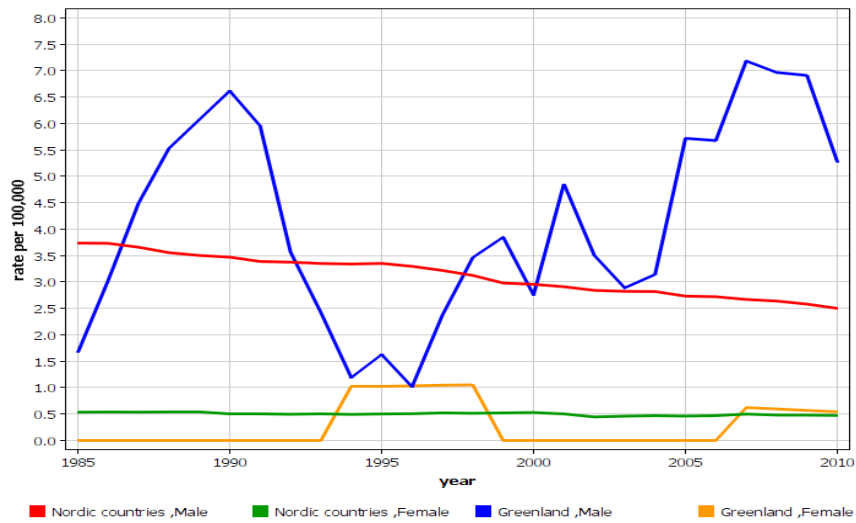
### Unknown and ill-defined Incidence: ASR (World) age 0-85+



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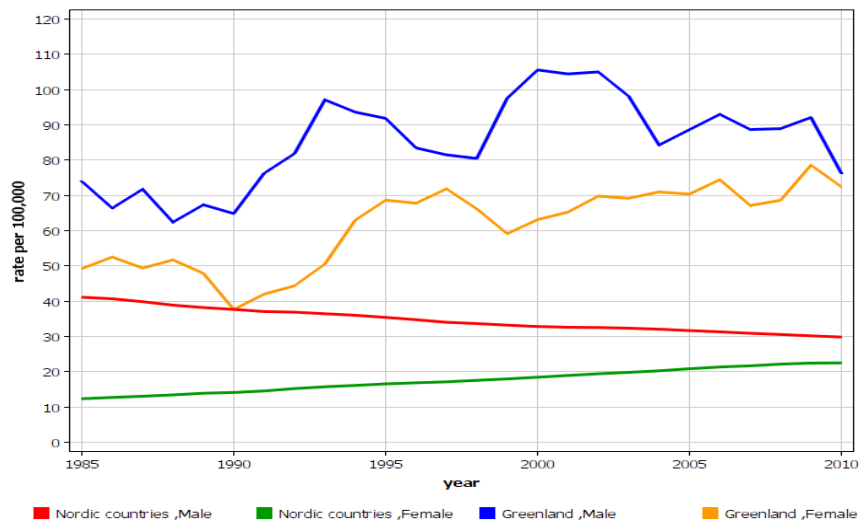


### Larynx Incidence: ASR (World) age 0-85+



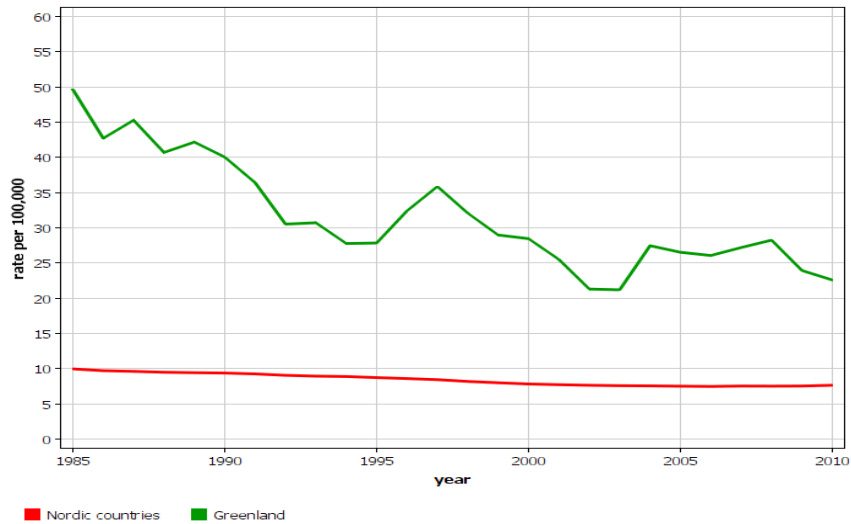
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### Lung Incidence: ASR (World) age 0-85+



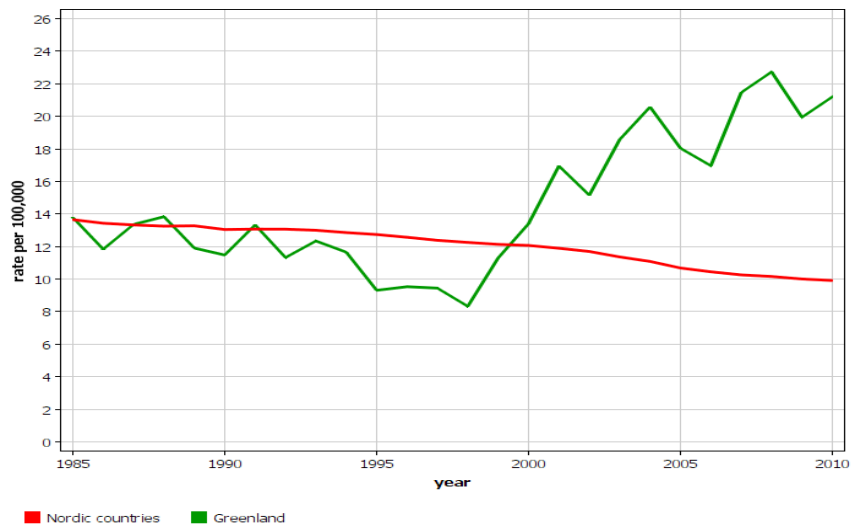
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**Cervix uteri**  
Incidence: ASR (World) age 0-85+



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**Ovary etc.**  
Incidence: ASR (World) age 0-85+



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