



ARCTIC COUNCIL

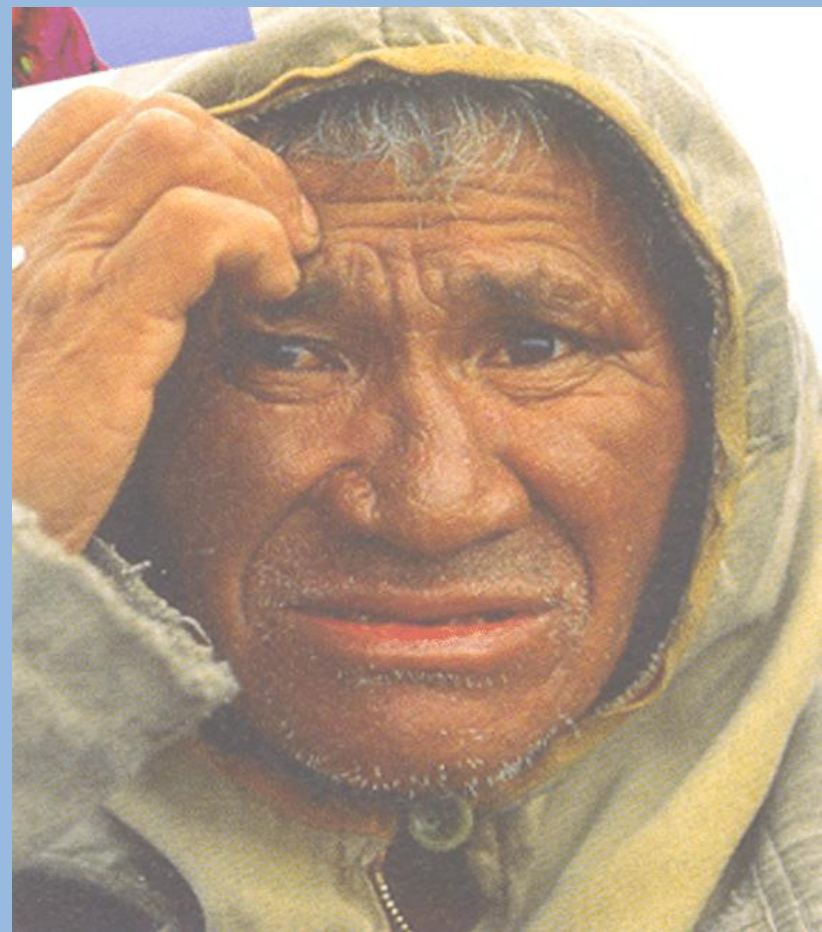
# AMAP

*Arctic Monitoring and Assessment Programme*

## Miljøringen 2013

### **Samfunnsmedisin. Kobling mellom miljøtilstand og helse**

Jon Øyvind Odland  
ISM, UiT  
AMAP





Employees	2 750
Students	11 800
Total budget	2 237 MNOK (USD 364 Million)
External projects	570 MNOK (USD 93 Million)
Study programmes	> 300 / 21 Masters programmes



ARCTIC COUNTRIES

Permanent Participants (indigenous peoples organizations)

Observers (countries and organizations)

**ARCTIC COUNCIL**

**ACAP**

Arctic Council  
Action  
Plan

**AMAP**

Arctic Monitoring  
and Assessment  
Programme

**CAFF**

Conservation  
of Arctic Flora  
and Fauna

**EPPR**

Emergency, Prevention,  
Preparedness  
and Response

**PAME**

Protection of  
the Arctic Marine  
Environment

**SDWG**

Sustainable  
Development  
Working Group

# AMAP

Arctic Monitoring and Assessment Programme

## AMAP's geographical coverage



# AMAP

## Arctic Monitoring and Assessment Programme



HENRY HUNTINGTON



GNWT/NWT ARCHIVES

◀ Iñupiat, Anaktuvuk Pass, Alaska.

Dene, Midway Lake, NWT, Canada.



STAFFAN WIDSTRAND



PIS PROJECT

◀ Saami, Kautokeino, Norway.

Chukchi, Kanchalan, Russia.

Klassiske	Nye	Metaller
PCB	Bromerte	Kvikksølv
DDT	Fluorerte	Bly
HCH	Parabener	Cadmium
HCB	Ftalater	Arsenikk
Lindane	Bisfenol A	Nikkel
Dioxiner	Siloxaner	Selenium
	Nanopartikler	



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# AMAP

## Arctic Monitoring and Assessment Programme

### Health assessments

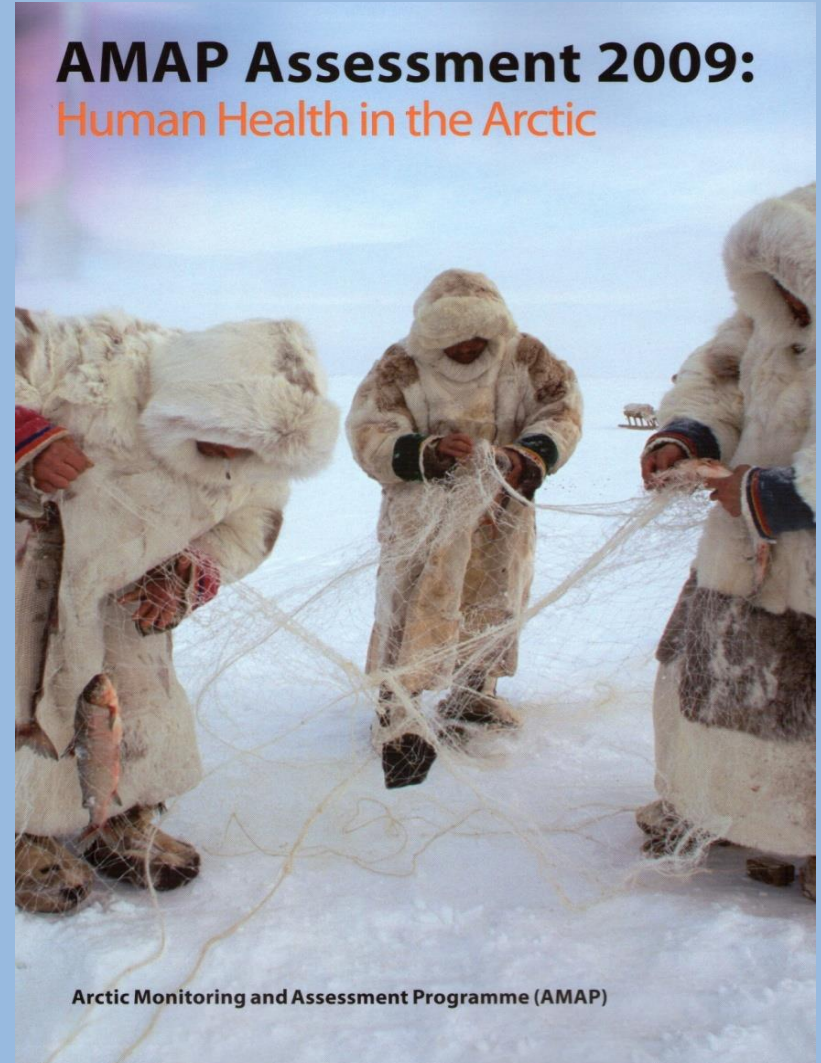
1998

2002

2009

2015 (planned)

**AMAP Assessment 2009:**  
Human Health in the Arctic



Arctic Monitoring and Assessment Programme (AMAP)

## Gestational period

- OCs
  - Cross the placenta
  - Secreted into breast milk
- Embryonic and perinatal periods are the most sensitive stages

AMAP, 1998



Levels of contaminants in mother's blood and milk **is an indicator of the** potential risk to the fetus and the growing child



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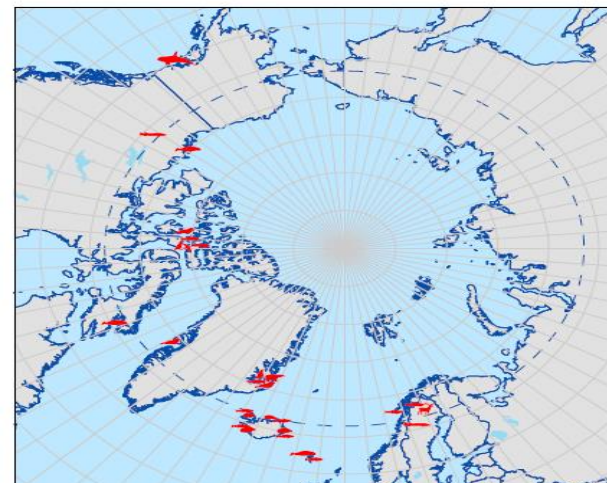
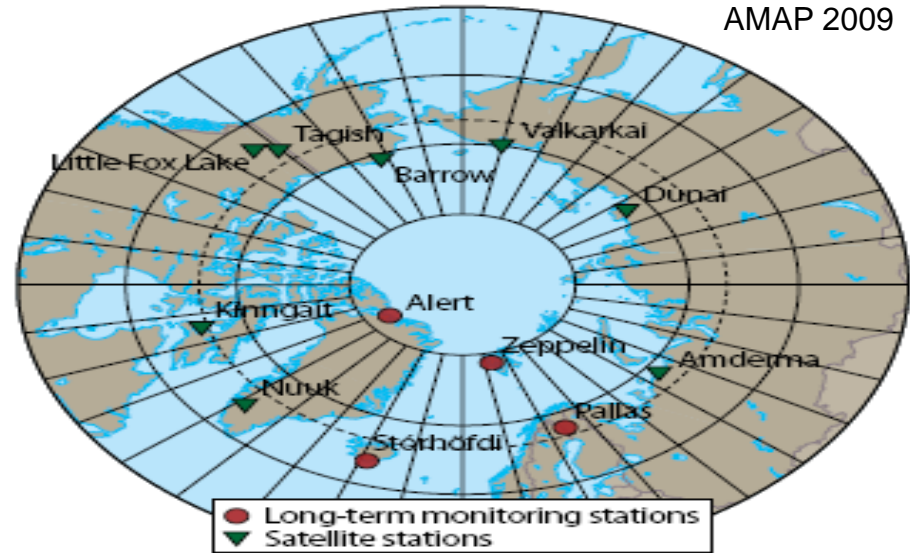
## AMAP POPs monitoring

- air,
- other media,
- humans.

Trends in biota  
Optional under  
UNEP/GMP.

<http://www.amap.no>

AMAP 2009



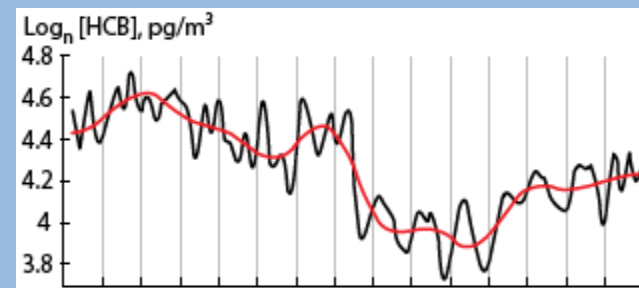
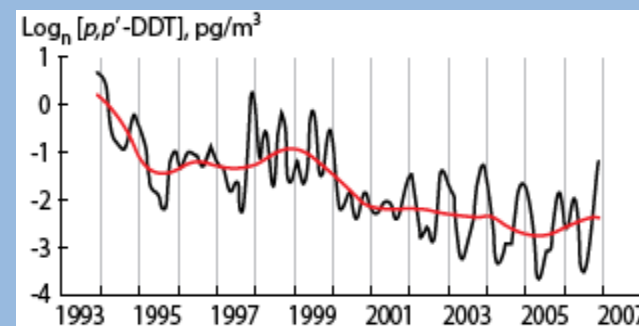
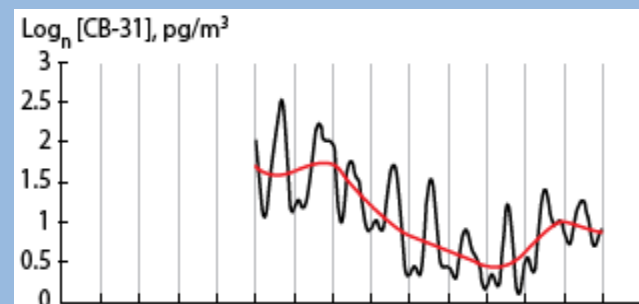
- Killer whale
- Fulmar / kittiwake
- Murre / guillemot
- Polar bear
- Beluga / pilot whale
- Cod / sculpin
- Mussels
- Ringed seal
- Pike / burbot
- Char
- Reindeer

### Legacy POPs – Time trends in air

**Decreasing trends** in the Arctic during 1970s – 2000.

**PCB, DDT** trends at Alert (Canada) and Zeppelin (Svalbard) show strong declines.

Indications of **slight increasing trends** for **HCB** and **PCB** in recent years, might be an impacts of climate change on pathways and recycling.



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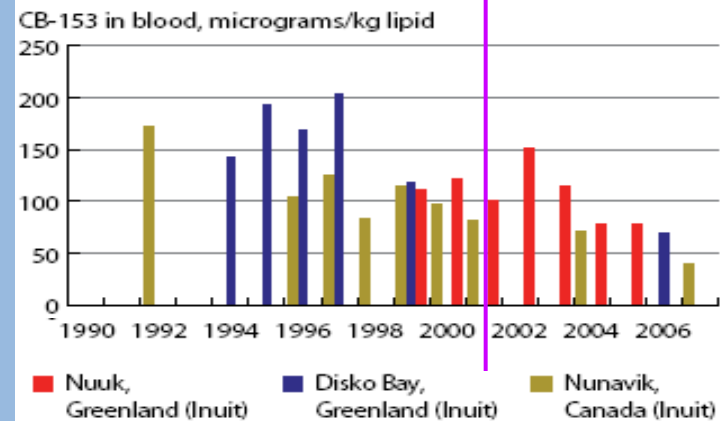
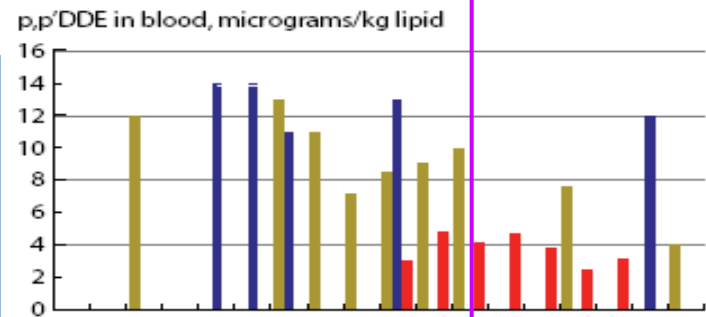
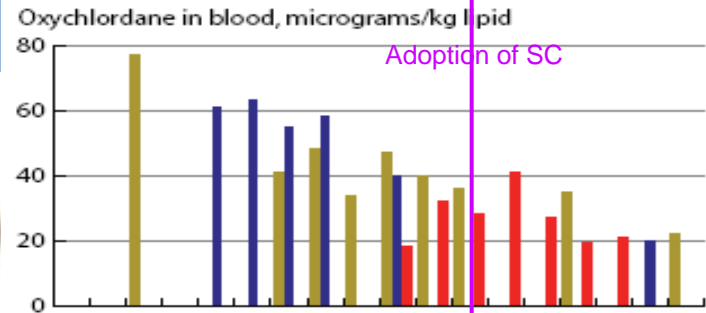
### Time trends of Legacy POPs in humans

Limited data on temporal trends

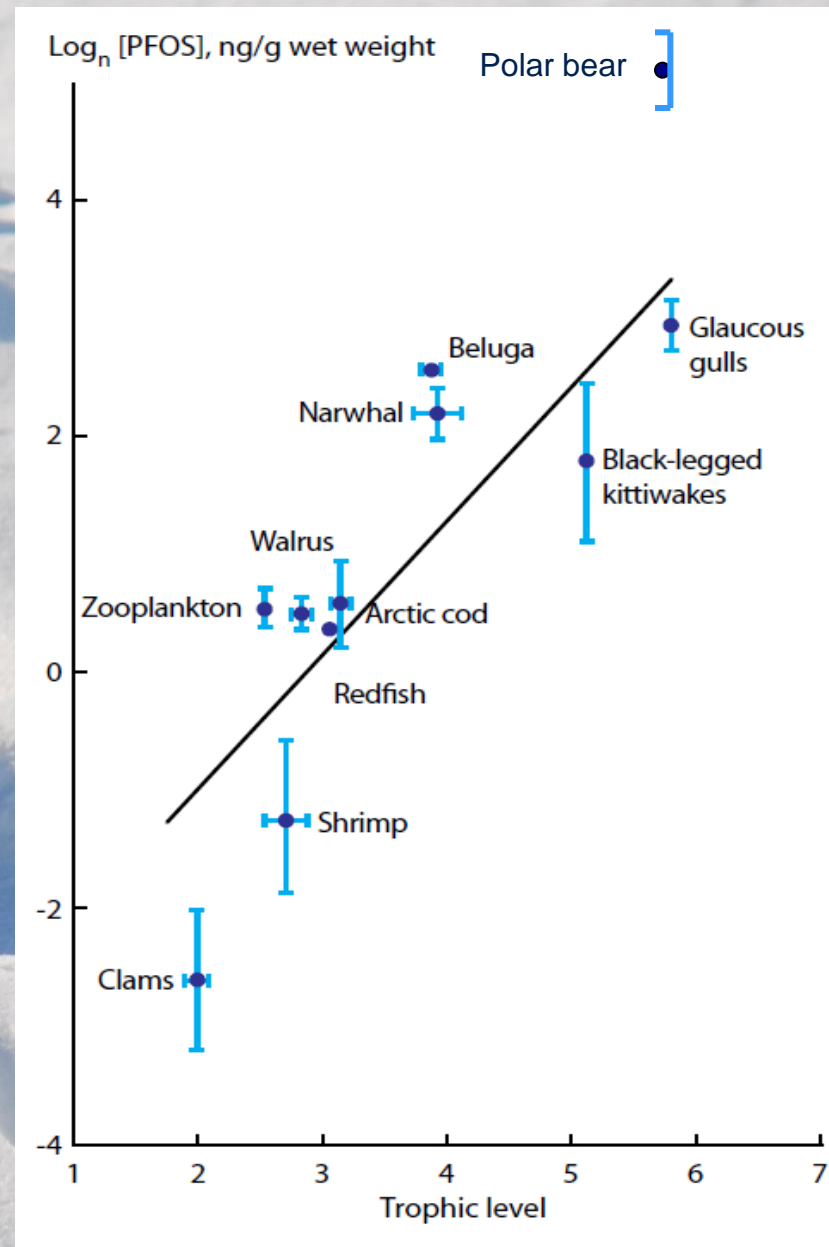


Different reasons for decreases:

- Changes in diet (traditional to store-bought foods)
- Health advice to critical groups
- **Lower levels of contaminations**
- Need to understand reasons



# Biomagnification of PFOS in Arctic food chains



### Effect of Climate Change on food web



Polar Bears at  
Garbage Dump,  
Churchill, Canada

Lack of understanding of climate change effects on food web structures and dynamics means that it is not currently possible to make reliable predictions of the extent of impacts ...

Climate change and variability, will affect biodiversity and ecosystem composition, function and vulnerability.

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**Climate change may**

- increase exposure to POPs,
- risks related to their harmful effects

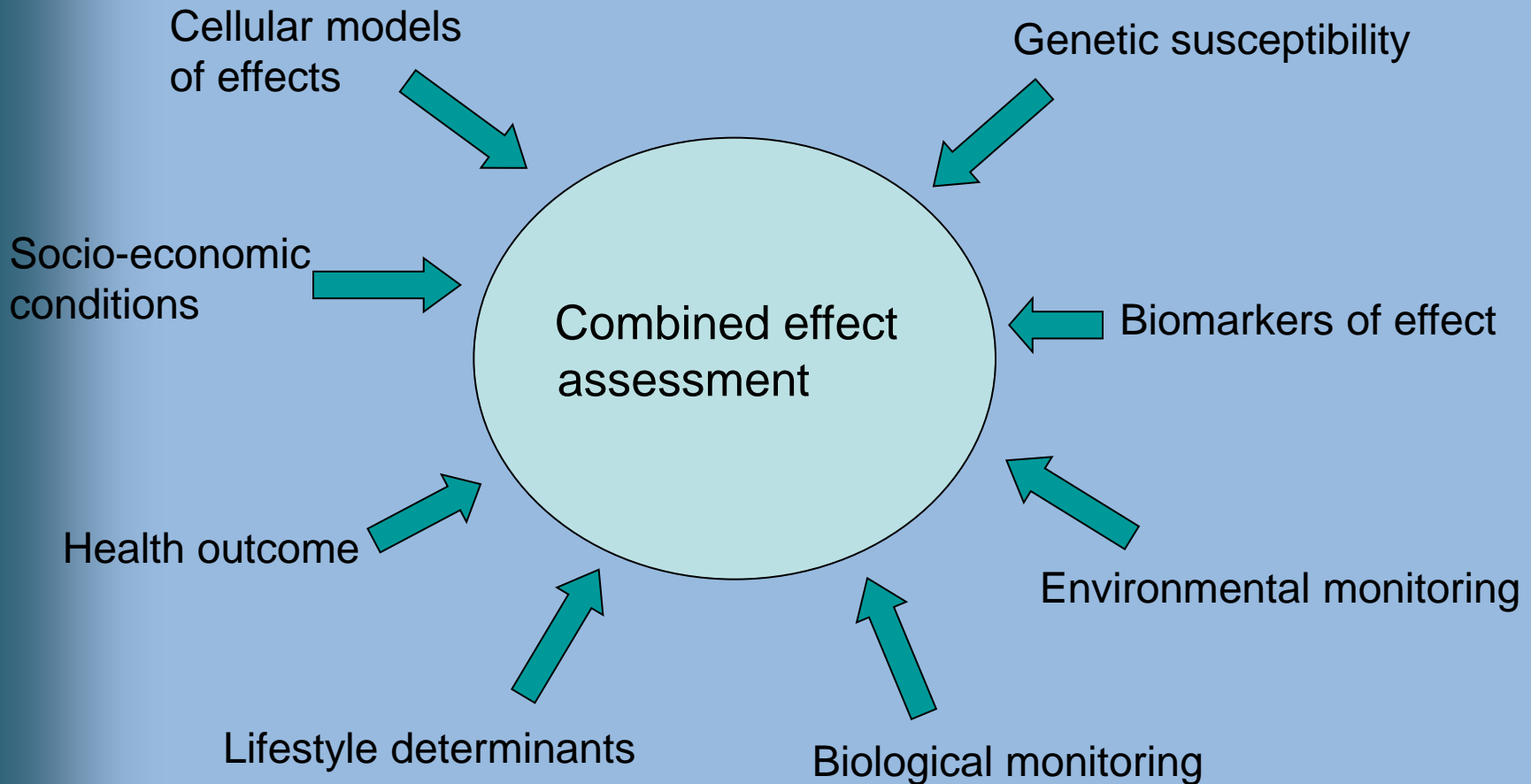
**Socio-economic factors** such as education and general health status can also contribute to human vulnerability to POPs.

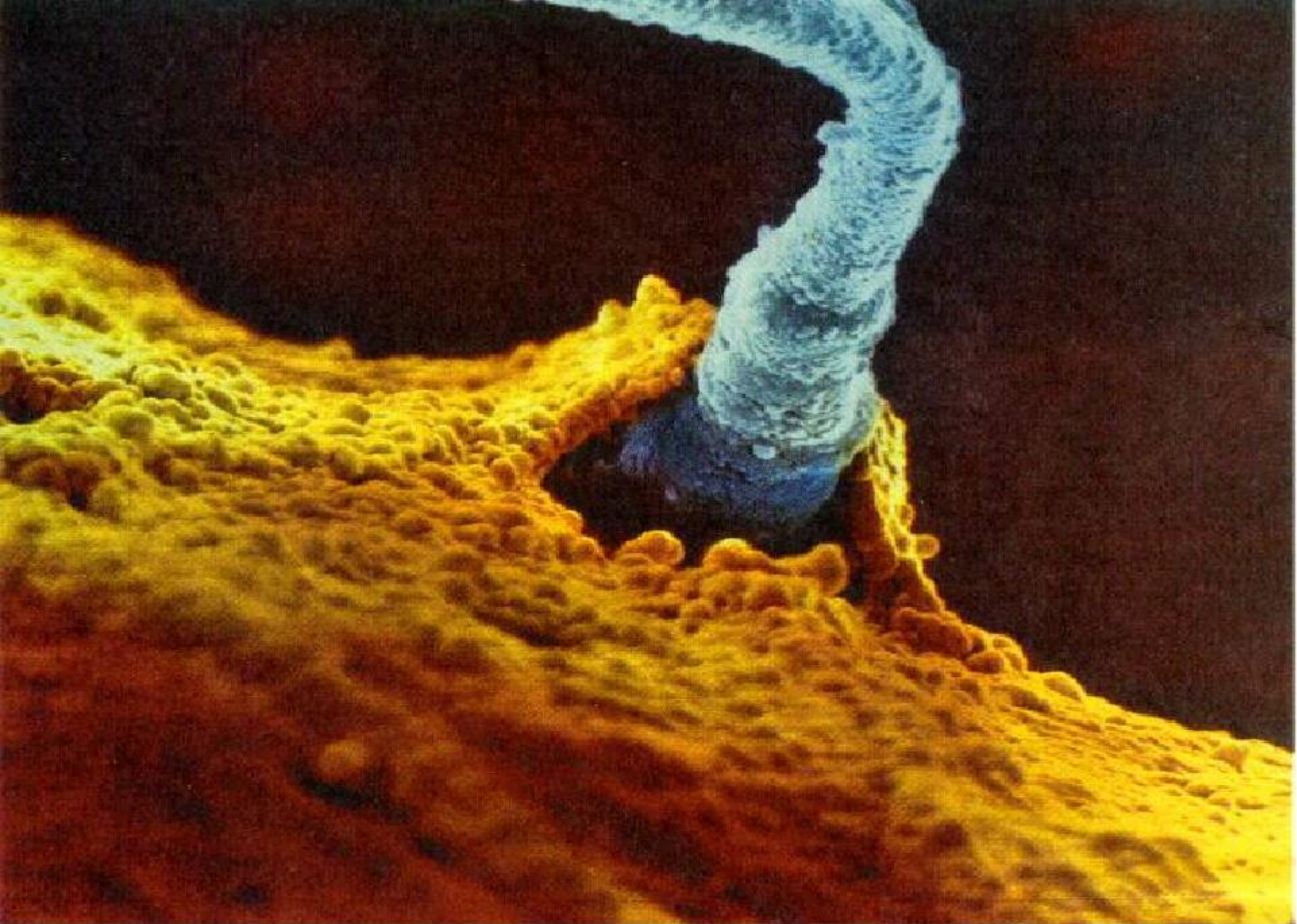
**Vector-borne disease are expected to increase** associated with climate change, e.g. malaria, may lead to enhanced demand for DDT.

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### Disciplines involved in combined effects studies





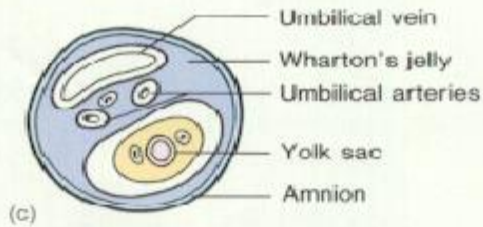
Vinnaren. Lennart Nilssons bild av spermien som befruktar ägget.

FOTO: LENNART NILSSON



# *Vulnerable placenta barrier*

- **Smoking**
- **Infections**
- **Pollutants**



# Humans are vulnerable



# Den sminkede historien – pen med parabener!



TESTKADDET I YOGURT OG MÆLK ER PRÆGNET MED VIKTIGE KEMISKE STOFFE, DER ER NØDVENDIGE TIL AT BEHOLDE SMAGEN I LANGE TIDER. Disse stoffer er parabener, som er naturligt forekomme i kroppen. Parabener er også brugt i mange andre produkter, som kosmetik og medicin.

PARABENER ER NØDVENDIGE TIL AT BEHOLDE SMAGEN I LANGE TIDER.

# Vi kan ikke hindre folk i å smøre seg her eller der!

DEN SMINKEDE HISTORIEN



12 | DEN SMINKEDE HISTORIEN

## Negative health impacts

- Reproductive health
- Birth outcomes
- Mental, psychomotor development, neurological development
- Hormonal mimics
- Lung function and hypersensitivity
- Immune system
- Cancer

# AMAP

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Kohorter krever tid

Case-control ikke etisk forsvarlig

Tverrsnitt begrenset verdi

**AMAP COHORTS**

**ARCRISK COHORTS**

**FAROE ISLAND**

**CLEAR**

**INUENDO**

**TROMSØ STUDY**

**NORWEGIAN MOTHER AND CHILD STUDY**

**FINNISH POPULATION COHORTS**

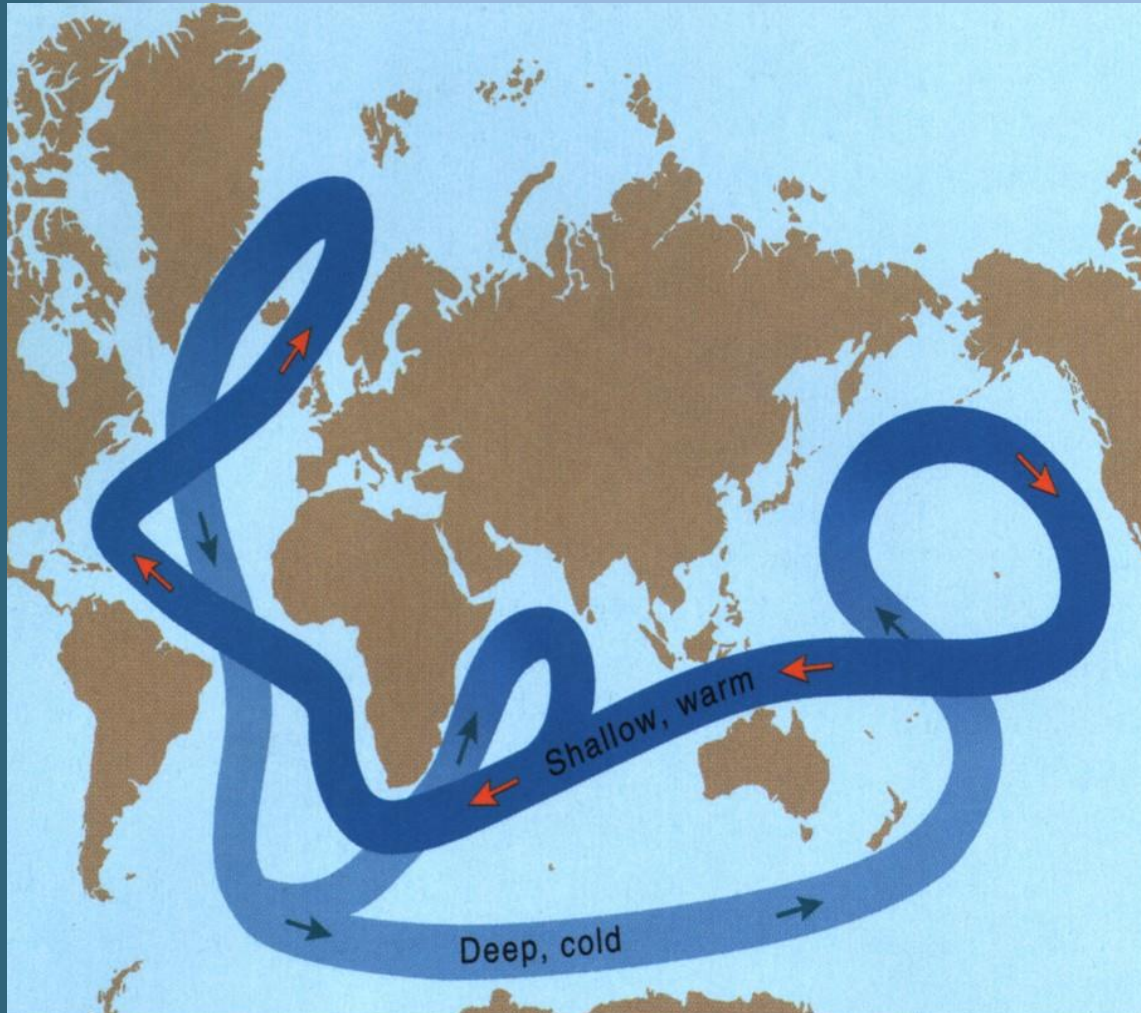
**RUSSIAN STUDIES**

**MEDITERRANEAN COHORTS**

**SOUTHERN HEMISPHERE COHORTS**

# ARCTIC INFLUENCE ON OCEAN CIRCULATION

Arctic Monitoring and Assessment Programme



The Arctic plays a fundamental role in circulation of water in the oceans of the world. Every winter, several million cubic kilometers of water sink to deeper layers, which move water slowly south along the bottom of the Atlantic Ocean.

*The polar front influences global ocean currents*

# Mer giftstoffer av langvarig amming



Det er på tide å revurdere amme-anbefalingene, mener miljøforsker.

**VIGDIS HVAAL**  
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**SULVEIG HUSØY**  
solveig.husoy@nrk.no

Publisert 16.11.2009 15:10. Oppdatert 16.11.2009 15:24.

[Kommentarer](#) [Skriv ut](#) [Del/tips](#)

Mengden miljøgifter i krupperne våre er lavere enn for noen tiår siden. Likevel får trolig spedbarn like mye miljøgifter i seg - fordi kvinner ammer lengre. For gjennom morsmelken overføres også betydelige mengder miljøgifter fra mors fettlagre.

Ved Folkehelseinstituttet har de forsket på morsmelk siden 1985.

- Spedbarn og fostre er blant de mest sårbare i befolkningen. Derfor er vi veldig interessert i å vite hva de blir utsatt for, forteller seniorforsker ved Folkehelseinstituttet Merete Eggseth.

Hun mener det er på tide å vurdere det faglige grunnlaget for dagens amme-anbefalinger på nytt.

## Les

Mange treng ekstra ammehjelp

- Ammeproblemer tas ikke på alvor

Brystmelk med banansmak?

Amming kan forebygge astma

Menn sier ja til amming

- Ikke amming for enhver pris

Køyking og amming

- Amming motvirker feite barn

amme

http://www.nrk.no/helse-forbruk-og-tilvissli/6867241

htt

17.01.12



# Why so difficult?

- Cohort studies over time
- Few participants
- Costly
- Difficult to measure outcomes
- Confounder problems
- The right chemical??
- Often observed effects inside normal variation
- Mixtures, combined effects
- Metabolites

# The precautionary principle

- 
- Breast feeding and the problem of good and bad influence
- 
- The Arctic dilemma
- 
- The tropical dilemma
- 
- [http://www.who.int/nutrition/topics/exclusive\\_breastfeeding/en/in](http://www.who.int/nutrition/topics/exclusive_breastfeeding/en/in)
- <http://ehp.niehs.nih.gov/realfiles/members/2002/110pA339-A347s>

# Principles of management

Most effective strategies are always developed locally

# Principles of management

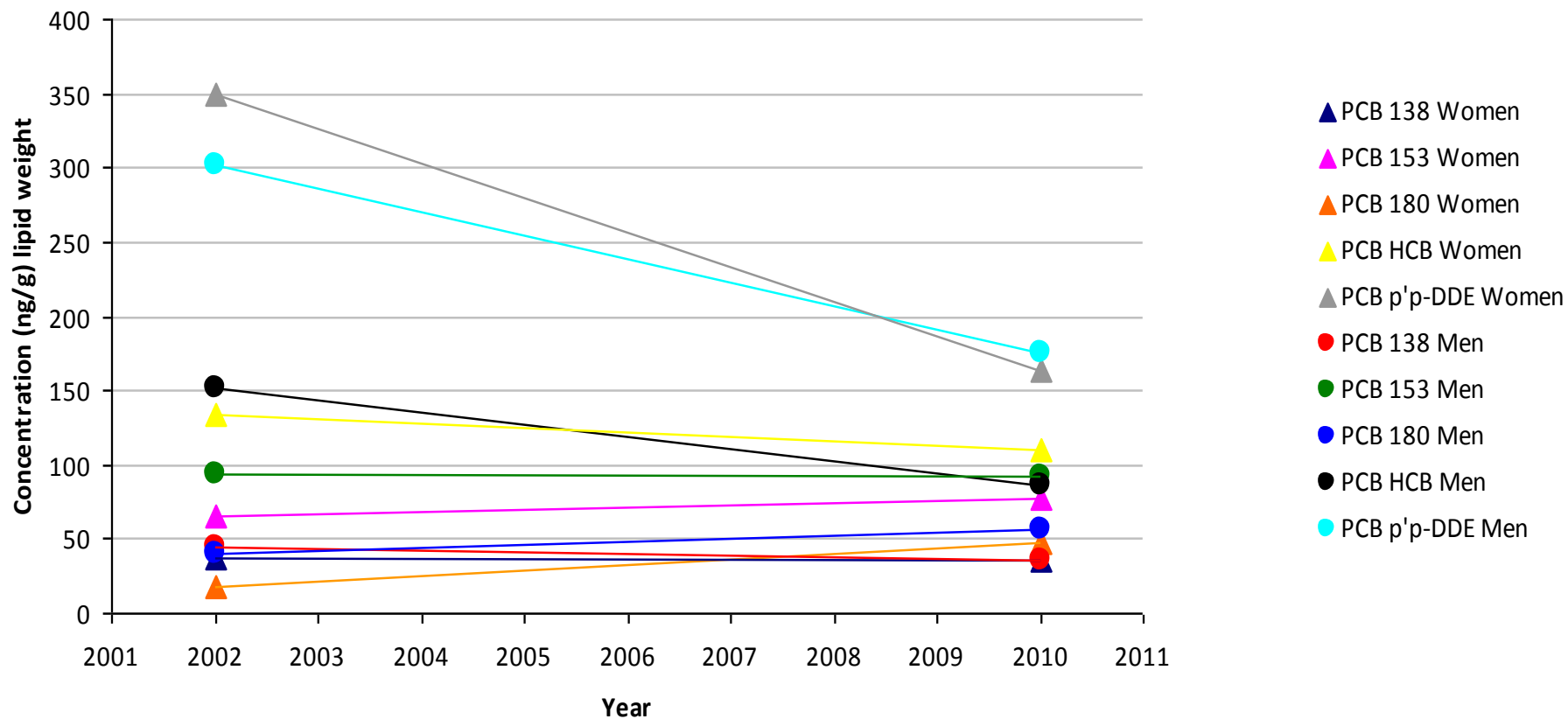
Indications of decreasing human PTS concentrations in North West Russia

Charlotta Rylander, Torkjel M. Sandanger, Natalya Petrenya, Alexei Konoplev, Evgeny Bojko, and Jon Øyvind Odland

Global Health Action 2011, 4: 8427 - DOI: 10.3402/gha.v4i0.8427

# Trends in Russia 2002-2010 II

Temporal trend in plasma concentrations of POPs in Nelmin-Nos



# Field training of indigenous volunteers engaged in clean-up operations in native communities of Chukotka Peninsula

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# Community cleaning-up



# On spot analysis for POPs





# Printed brochure on health risk reduction



**Нельзя!!!**  
Хранить воду, ягоды, солонину, рыбу, мясо, грибы, овощи и изготавливать любые напитки в технической таре

Для хранения воды, приготовления и хранения пищевых продуктов (засаливания рыбы, заквашивания овощей и растений, приготовления напитков) нельзя использовать тару, в которой хранились какие-либо химические составы или технические жидкости. Допустимо использовать только емкости, где есть надписи «для пищевых продуктов». Не пытайтесь отмыть загрязненную техническую тару. Даже если эти емкости не имеют запаха и видимого загрязнения, они сохраняют свои отравляющие свойства после мытья. Результаты отравления могут быть Вами обнаружены не сразу, а через длительное время. Последствия для здоровья могут проявиться не только у Вас, но и у Ваших детей.

Чтобы не загрязнять дичь лдовитым свинцом, лучше всего применять для охоты дробь, которая изготовлена из других материалов (например, из стали). Желательно не проводить самостоятельно плавку и разливку свинца для изготовления охотничьей дробы, рыболовных грузил и других изделий в домашних условиях. Если Вы все же делаете дробь и рыболовные грузила самостоятельно, это надо выполнять только вне дома — на улице или в хорошо проветриваемых подсобных помещениях. Во время литья свинца не должны быть рядом дети, беременные и кормящие женщины. Пары свинца очень ядовиты!!!

Важно помнить о чистоте в доме. На полу, стенах, окнах, столах, шкафах и посуде накапливаются вещества, которые с пищей или при контакте с человеком, могут нанести вред. Регулярная влажная уборка помещений с использованием мощных средств поможет Вам защитить свой организм и здоровье Ваших детей!

Мясо оленя, диких животных, птиц, рыб является хорошим источником белка. Белок необходим людям, занятым тяжелой работой, детям, подросткам и беременным женщинам.

Употребление жира животных также важно. Жир позволяет Вашей организму вырабатывать много тепла и защищать Ваши органы. Особенно полезен жир некоторых рыб, например семги, гольца, форели, корюшки. Жир содержит вещества, которые охраняют Ваш организм от заболеваний сердца и сосудов.

Употребление пищи с достаточным количеством витаминов поможет Вам уберечь свой организм от заболеваний.

Многие болезни человека связаны с недостатком витамина С. Он содержится в растениях и больше всего в ягодах. Например: в бруснике, клюкве, голубике, чернике. Помните! При недостатке витамина С воспаляются десны, разрушаются зубы, долго не заживают раны на коже, нарушаются кровеносные сосуды, организм плохо борется с различными болезнями.

Витамин В нужен для того, чтобы из пищи, которую мы едим, образовывалась энергия, чтобы в хорошем состоянии были Ваши нервы и кровь. Этого витамина много содержится в оленье крови, печени животных и рыбы; в яйцах птиц.

Кальций особенно необходим детям, беременным женщинам, пожилым людям. Если его мало в организме, страдают кости, зубы, ослабевают мышцы, может нарушаться работа сердца и нервной системы. Кальций содержится в хрящах, головах и коже рыбы, хрящах оленя и других животных, в молоке.

Для организма важно, чтобы вместе с пищей поступало достаточное количество железа, которое входит в состав крови. Железо помогает Вашей организму расти и образовывать тепло. Много железа содержится в крови и мясе животных.

Рекомендации для малочисленных коренных народов, проживающих в Мурманской области, в Ненецком и Таймырском АО, а также во внутренних районах Чукотского АО

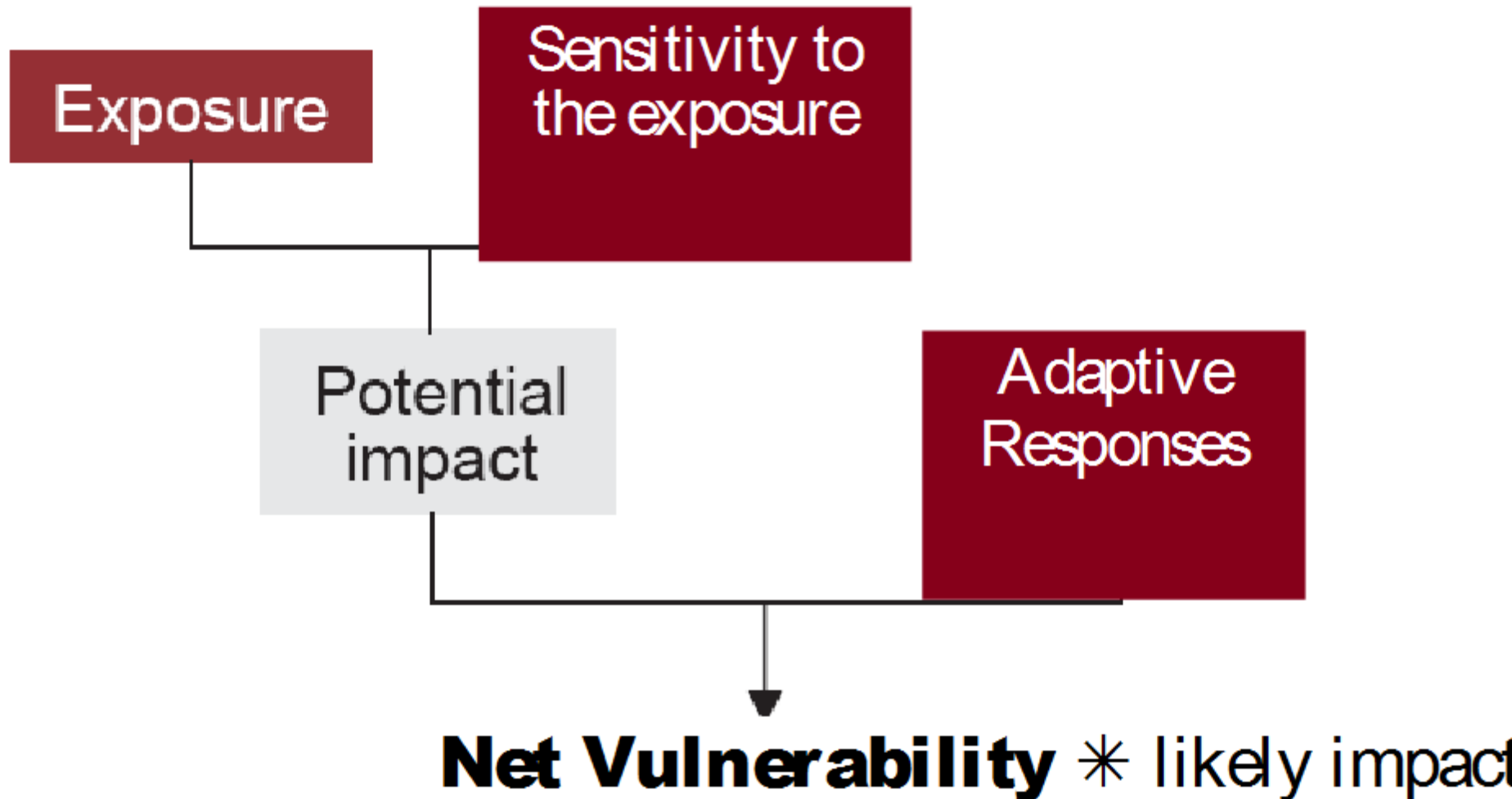
**Соблюдение этих советов поможет Вам сохранить свое здоровье и здоровье Ваших близких.**

Если после прочтения этой брошюры у Вас появились вопросы, вы можете обратиться в местное учреждение здравоохранения (больницу, амбулаторию, территориальное управление Роспотребнадзора) или написать по адресу: 19 303 6 Санкт-Петербург, ул. 2-Советская, 4. Северо-западный научный центр гигиены и общественного здоровья.

Составители: Дударин А.А., Сычев Ю.Ф., Чащин В.Л., Абрамова Л.И., Петрушевская Ю.А.



# 'Adaptation' and 'Vulnerability'



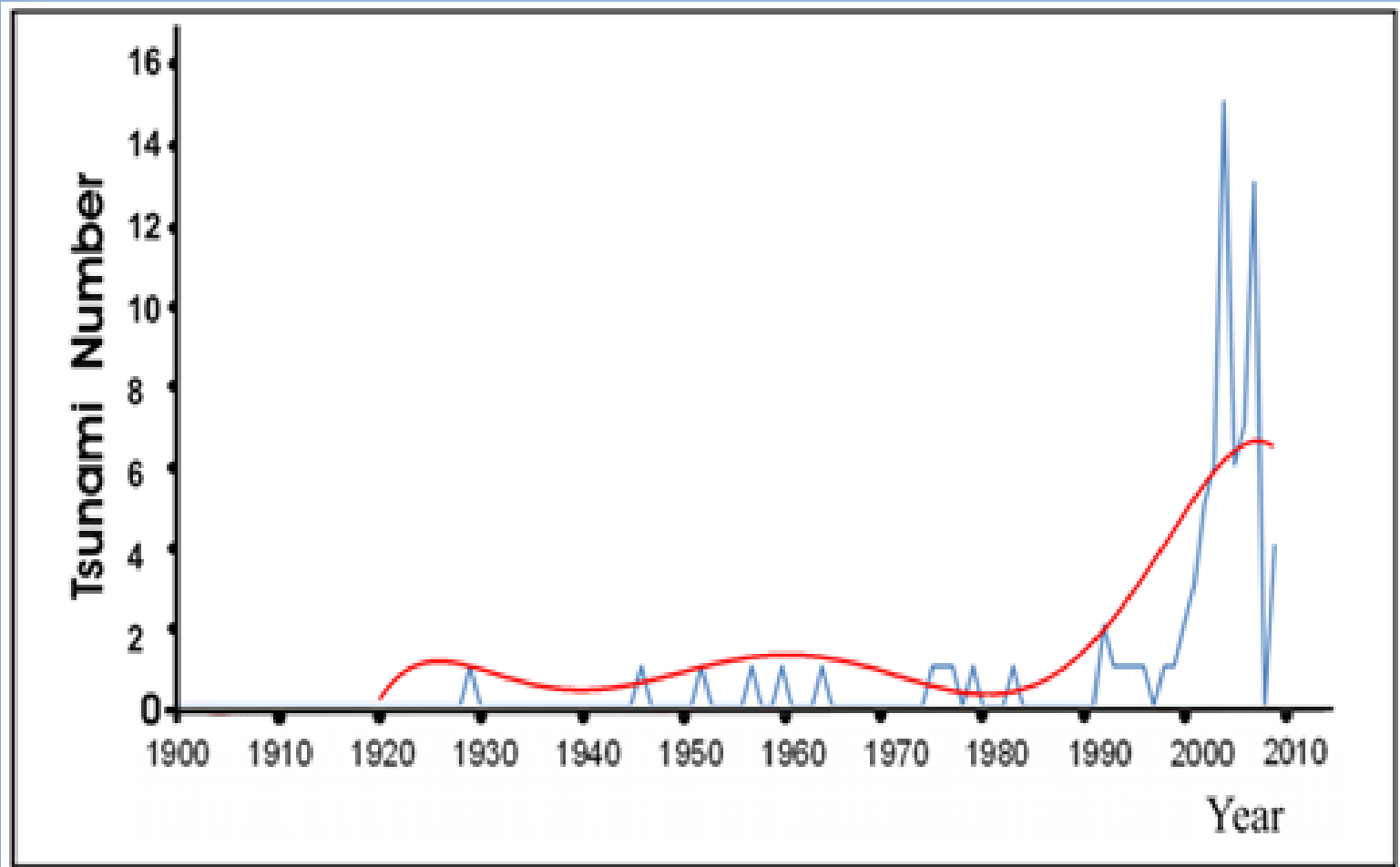
# AMAP

Arctic Monitoring and Assessment Programme



27,000 victims and 16,000 have been missing due to the 2011 tsunami

## Estimated Cumulative Temporal Trend of Intensity of Washouts due to Natural Catastrophes



# In context

Contaminants are moderate, unavoidable factors in the environment

Contaminants must be integrated in public health thinking in general

New challenges are mixtures, emerging substances, metabolites

The precautionous principle is ruling

Climate change disturbs all methodologies

Ethical dilemmas in all population studies

Laboratory studies alone give wrong pictures

## Permafrost melting destroys buildings and communal infrastructures

City	Proportion of buildings at high risk
Norilsk	10%
Tiksi	22%
Dudinka	55%
Dixon	35%
Pevek, Amderma	50%
Chita	60%
Vorkuta	80%

*(Anisimov, Belolutskaya, 2002)*



Chersky Village, 2010  
Photo: V. Romanovsky



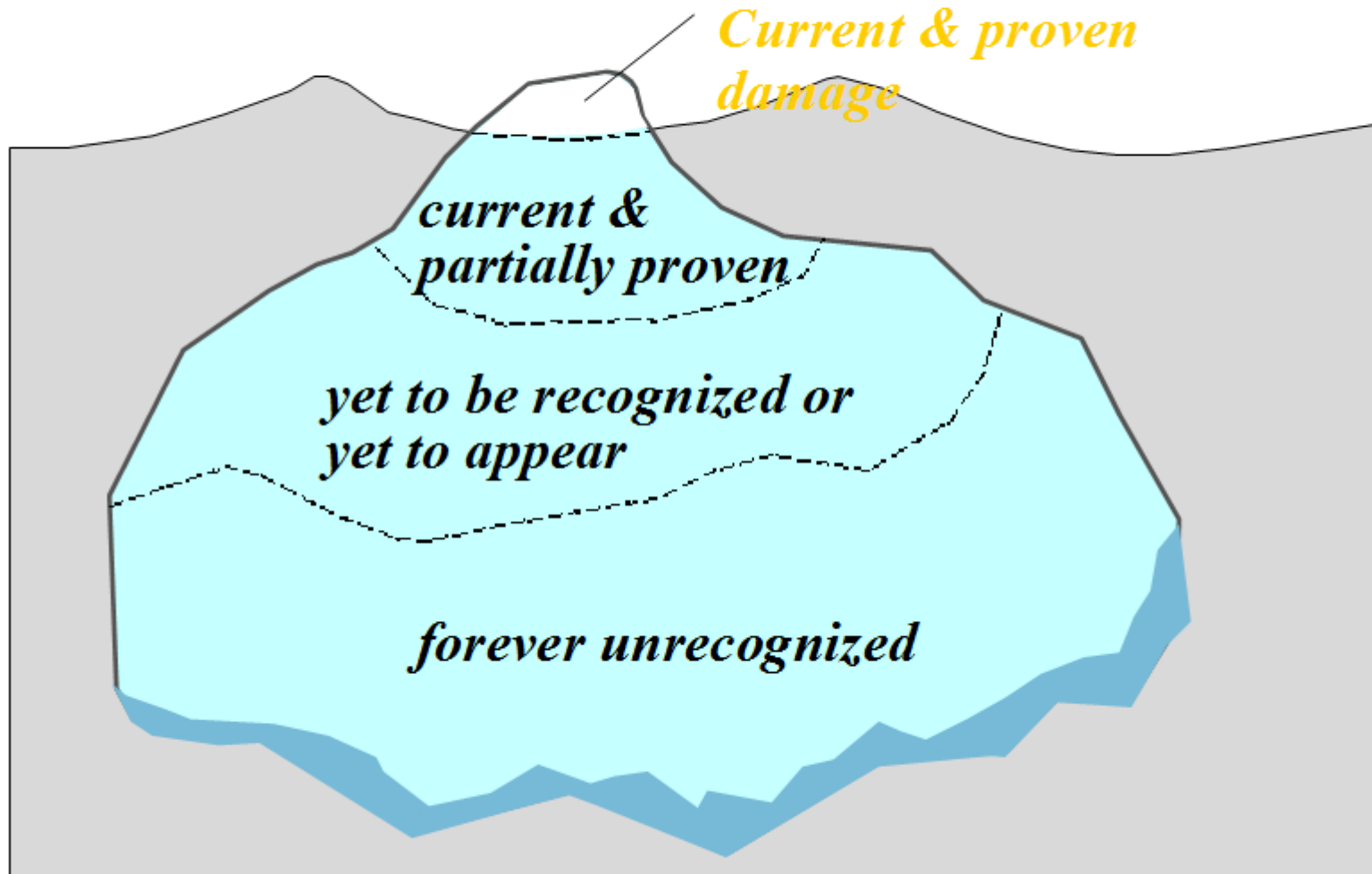
Yakutsk

July 2010



**Godt  
samarbeid  
mellom  
fagfolk er  
viktig**

# Tip of the Iceberg





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## Vi takker

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**Tusen takk!**

