UiT The Arctic University of Norway

The Tromsø Study

NOFE-conference

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The Tromsø Study

Foto: Yngve Olsen Sæbbe
www.nordnorge.com

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The Tromsø Study from 1974

Started because
1970's cardiovascular disease (CVD) epidemic in Norway and Western countries put a substantial burden on Northern Norway

Aim

- Study causes of CVD
- Risk factor surveillance
- Prevent disease

Gradually expanded
To cover widespread diseases as diabetes, cancer, lung-, musculoskeletal-, kidney- and eye diseases, chronic pain, osteoporosis, mental health, dental health and many others…

The Tromsø Study data

Questionnaires: education, work, physical and mental health, disease, symptoms, diet, physical activity, use of medication and health care services…

Biological specimens: Blood, urine, saliva, stools, nasal swabs

Measurements: Height, weight, blood pressure, heart rate, waist-hip ratio

Clinical examinations since 1994: Echo –and electrocardiography, carotid ultrasound, body composition, bone density, muscle strength, lung function, pain sensitivity, retinal photography, dental health…

Genotype-data in 2021 from 32 000 participants

Seven surveys - repeated measurements

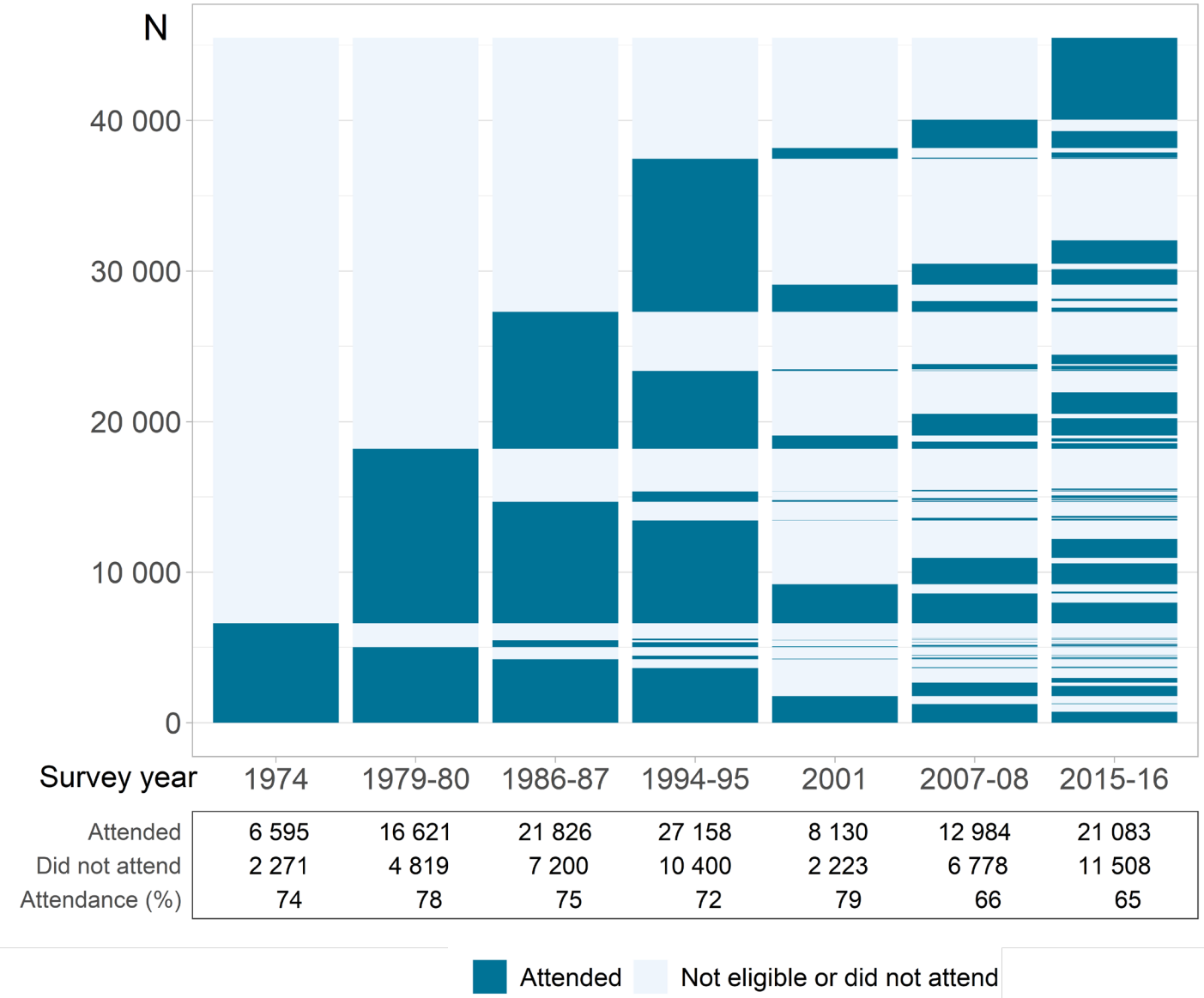
The Tromsø Study	1974	1979-80	1986-87	1994-95	2001	2007-08	2015-16
Participants, n	6595	16 621	21 826	27 158	8 130	12 982	21 083
Age, yrs	20-49 yrs	20-54 yrs	12-67 yrs	25-97 yrs	30-89 yrs	30-87 yrs	40+
Participation %	74%	78%	75%	72%	79%	66%	65%

The Tromsø Study

The Tromsø Study has expanded since 1974

Participation
N = 45 473 at least once
n = 18 510 three times or more
n = 1236 women six times
n = 737 men seven times

In Tromsø1 – men only
From Tromsø2 – men and women

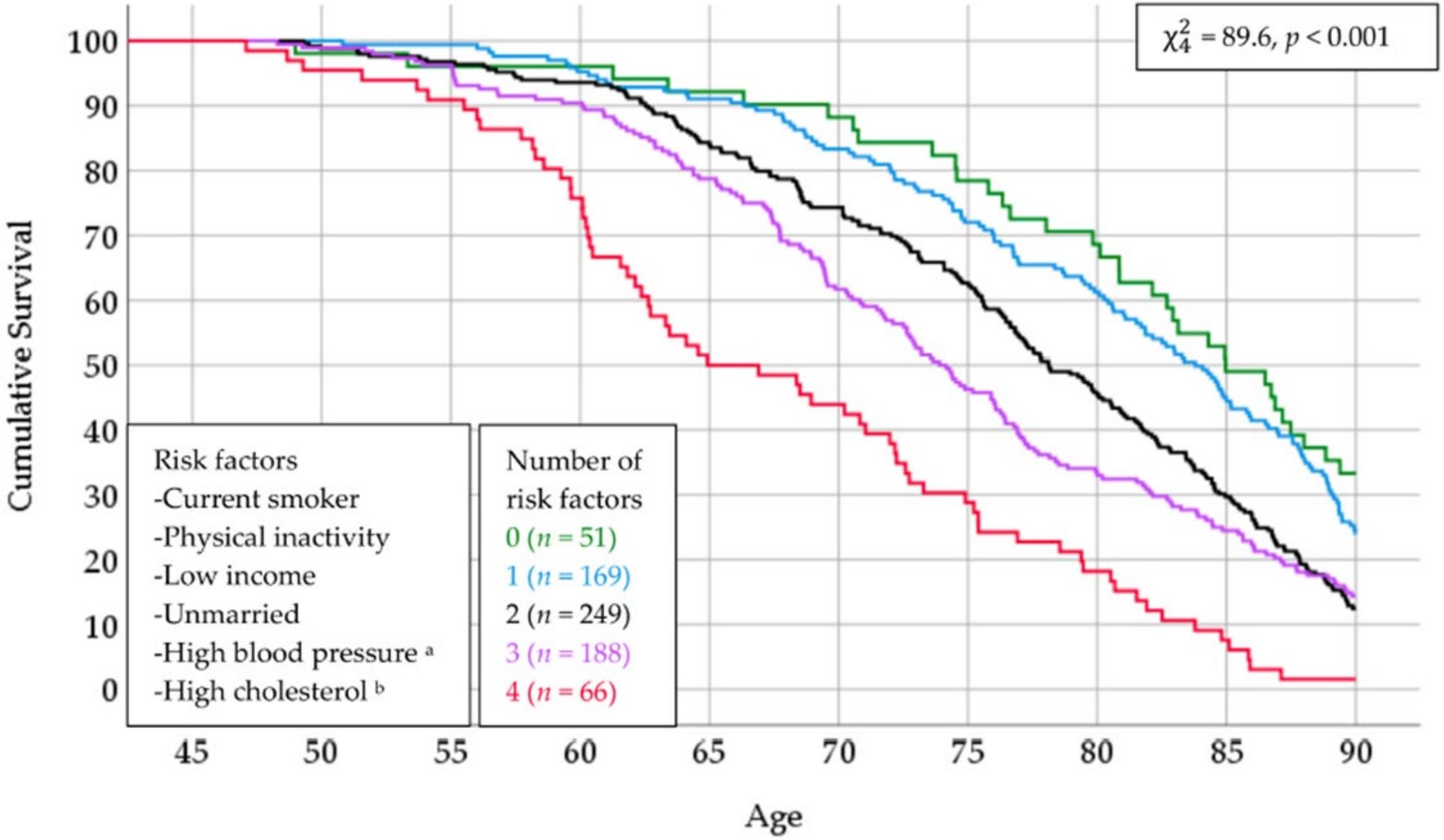


The Tromsø Study

Brenn T et al. 2019

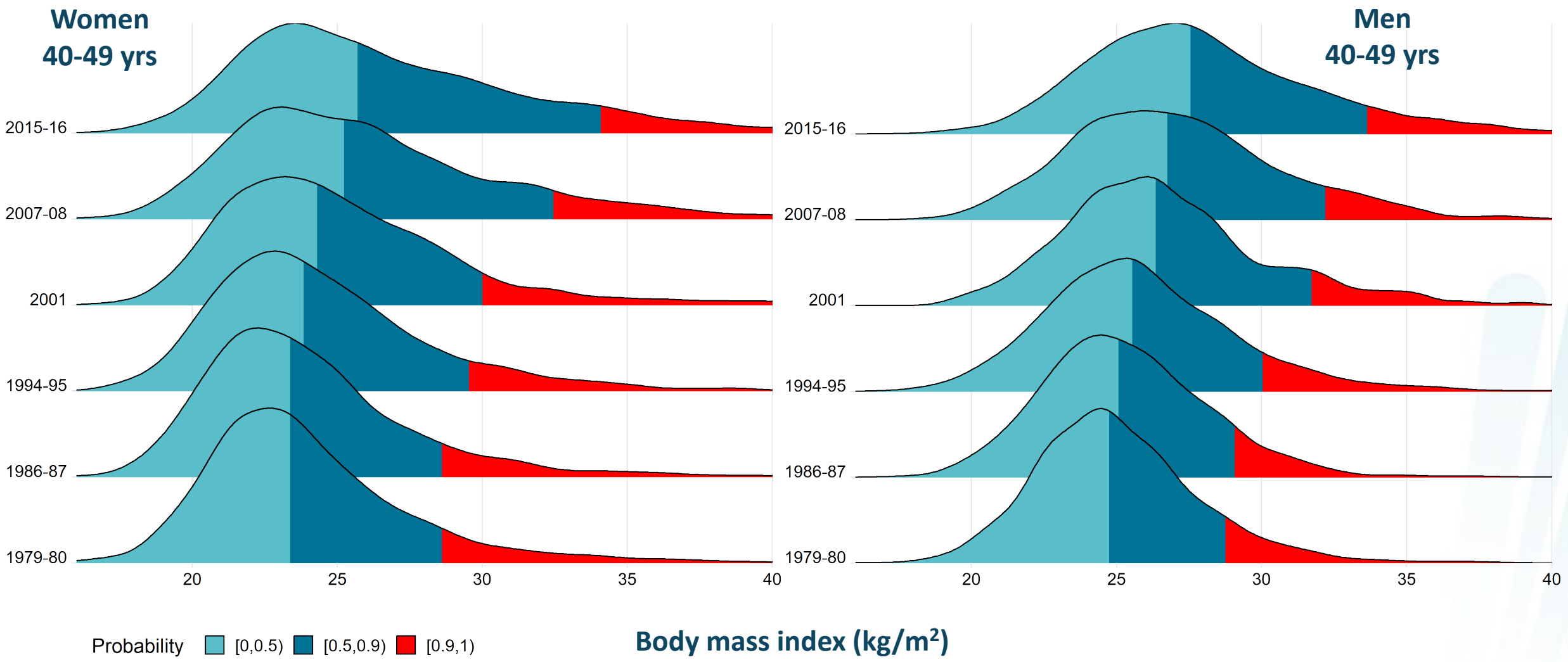
Repeated measurements

The Tromsø Study men – survival to 90 yrs



Risk factor development

Weight development over 40 years



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Endpoint registries

Mortality: total and cause-specific (Death Registry)

Cancer: incidence and mortality (Cancer Registry)

Tromsø Study Disease Registries

Cardiovascular disease

- Myocardial infarction
- Stroke
- Atrial fibrillation
- Venous thromboembolism

Fractures

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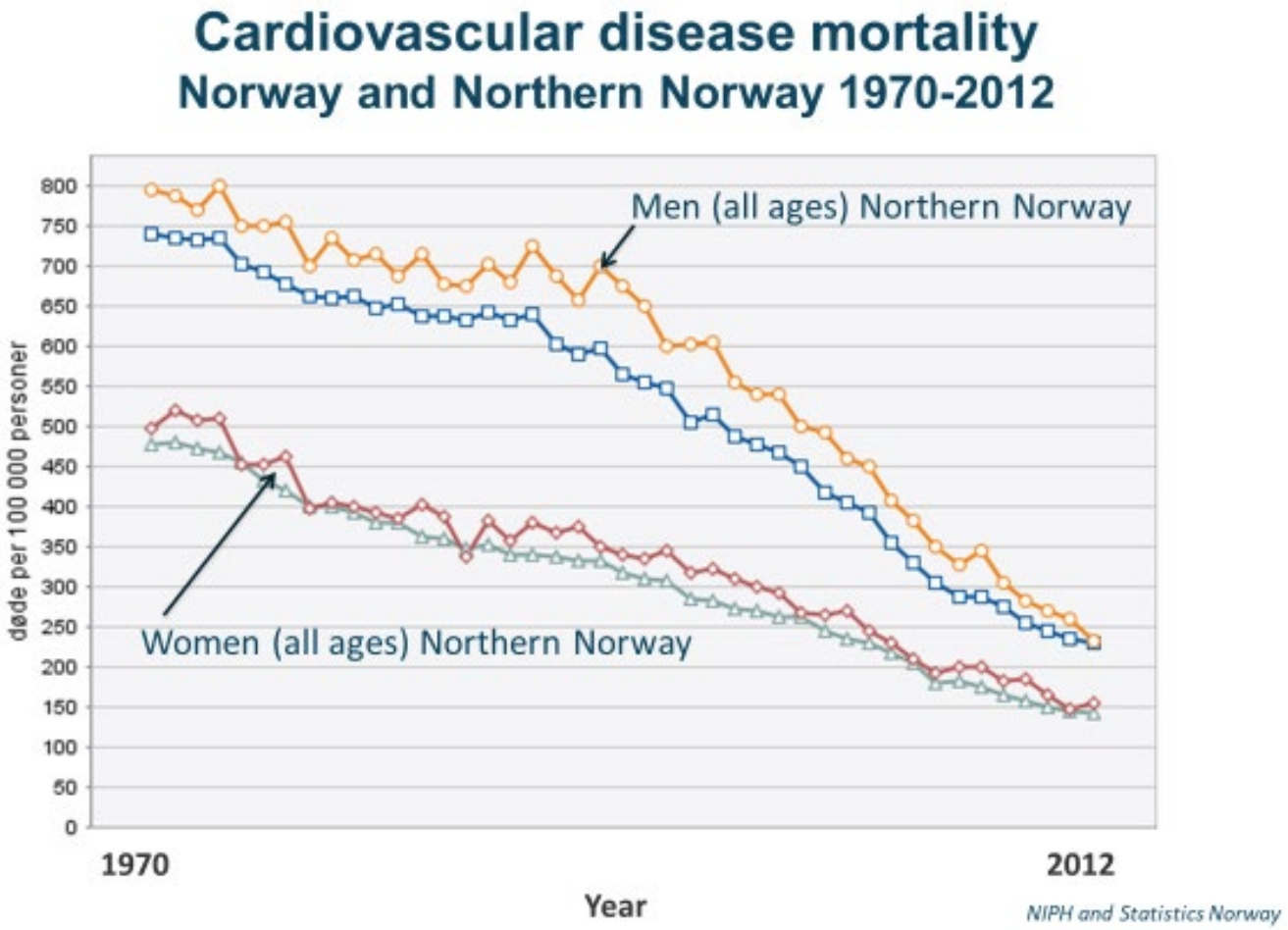
Endpoint registries – allows for comprehensive analyses

The Tromsø study shows that

- Reduction in CVD mortality and myocardial infarction is mainly due to reduction in out-of-hospital sudden death and large myocardial infarctions

- About 2/3 of the reduction can attributed to the decrease in modifiable risk factors (smoking, total cholesterol and blood pressure)

Mannsverk J et al. Circulation 2016



The Tromsø Study

Endpoint registries - unique data on stroke subtypes

Cerebral hemorrhage

- Cerebral hemorrhage 10-15% of strokes
- Mortality in 2020 comparable to 1990
  Decrease in women only – who have experienced largest decrease in blood pressure
- First month survivors have 60% increased mortality risk compared to the general population
- Improved prevention and treatment will improve prognosis and survival
  Planning a national clinical project to improve acute phase treatment

The Tromsø Study

DAGENS Medisin — Nyheter DMTV Debatt Pharma DM

24.09.2021

Alvorlige hjerneblødning-tall: – Dette er det mulig å gjøre noe med

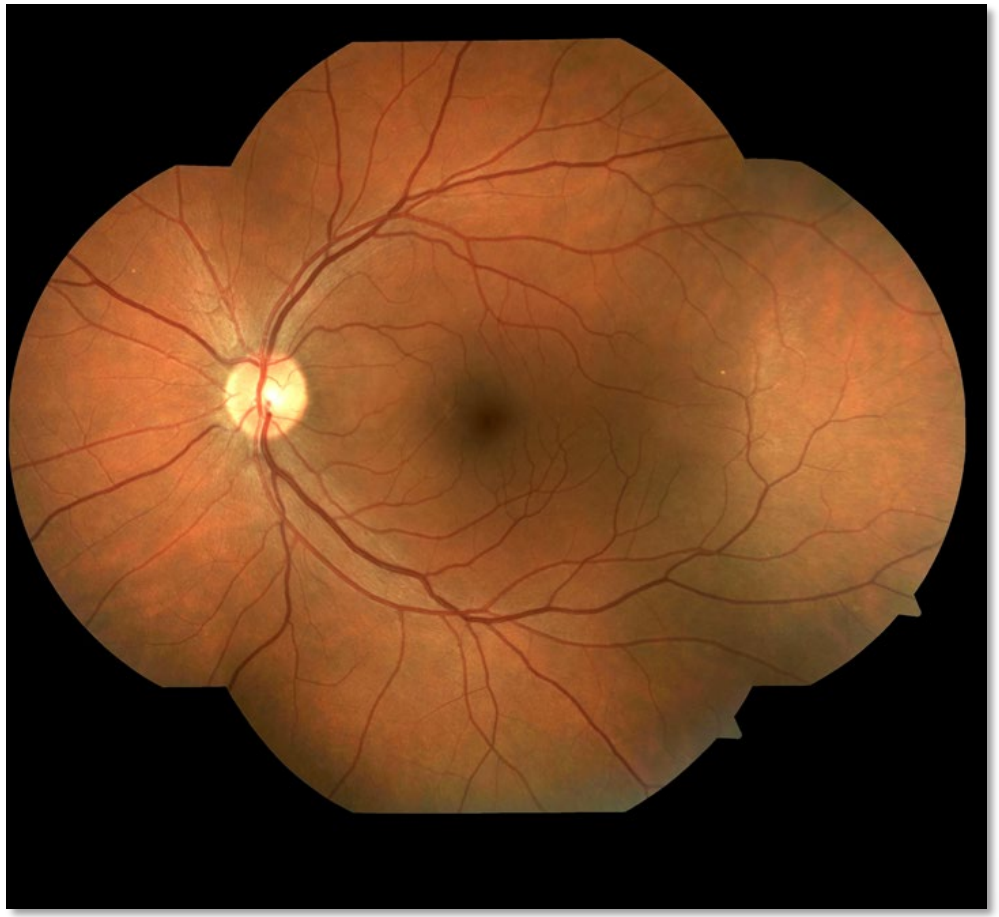
Ny forskning fra UiT viser at de som overlever den første måneden etter en hjerneblødning, har 60 prosent høyere risiko for å dø i årene etter, sammenliknet med de som ikke får hjerneblødning.

Carlsson M et al. Stroke 2021

Building of academic competence and research capacity

Tromsø Eye Study from 2007-8 (Tromsø6)

- **Retinal photography**
  > 7000 participants in 2007-8
  > 8000 participants in 2015-16
- Visual impairment related to
  Diabetic retinopathy
  Macular degeneration
  Cardiovascular disease
- Refractive errors (myopia) - European collaboration



The Tromsø Study

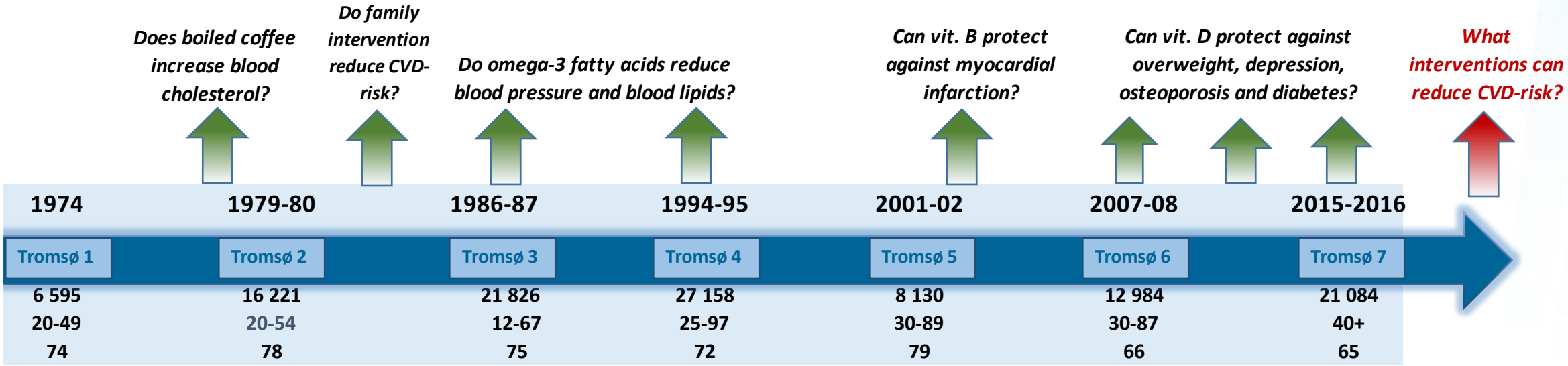
Bertelsen, G. et. al. Tromsø Eye Study

BMJ Open Hypothetical interventions and risk of myocardial infarction in a general population: application of the parametric g-formula in a longitudinal cohort study – the Tromsø Study

Wilsgaard T et al. 2020

Research questions further examined in intervention studies

- Followed up in clinical studies at University Hospital of North Norway
- Longitudinal cohort study and disease endpoints allows for modelling hypothetical interventions



Increasing research focus on

Inequality in health and NCD's

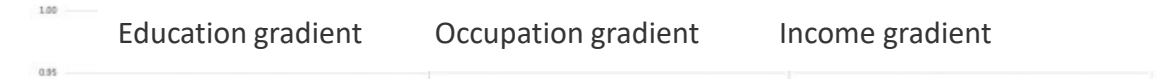
Contents lists available at ScienceDirect

Social Science & Medicine

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

Health and wellbeing in Norway: Population norms and the social gradient

Jan Abel Olsen[a,b,c,*], Marie Hella Lindberg[a], Admassu Nadew Lamu[a,d]

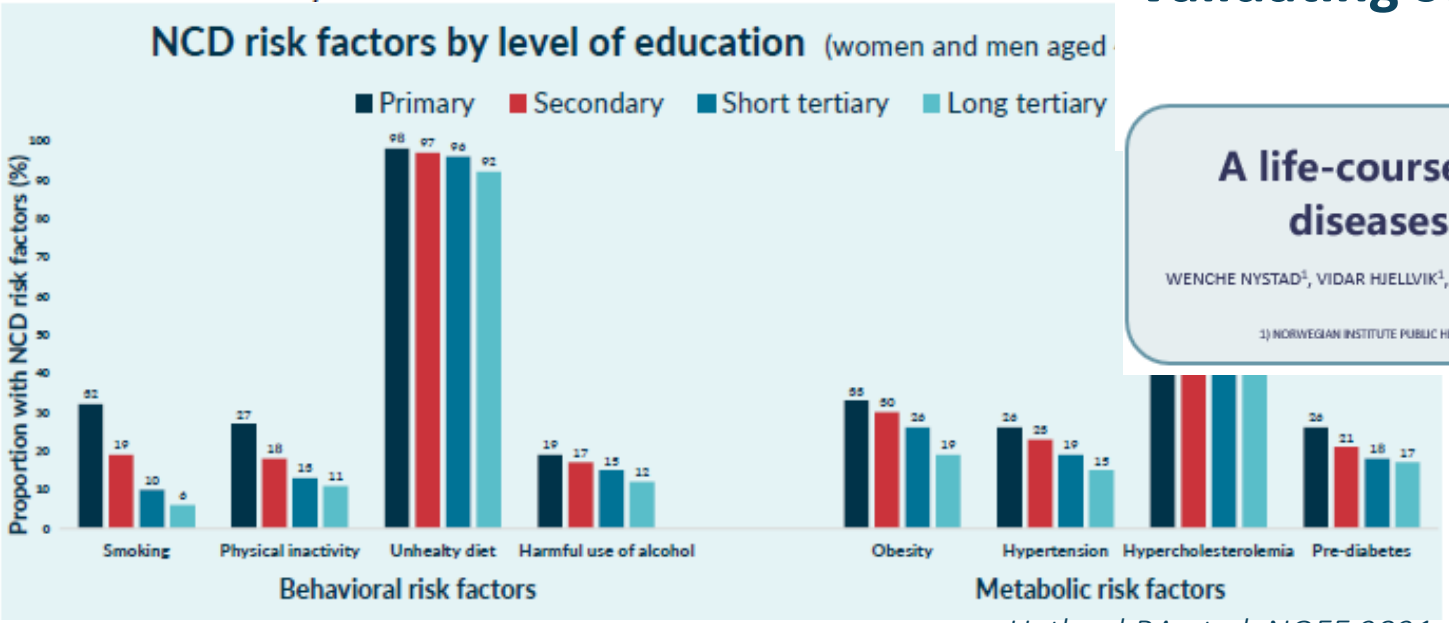


Social gradient in health

- strongest with income, weakest with education

Educational differences in non-communicable disease (NCD) risk factors

The Tromsø Study 2015-2016



Hetland RA et al. NOFE 2021

Combining education and income into a socioeconomic position score for use in studies of health inequalities *Lindberg MH et al. In review*

Validating self reported education *Vo CQ et al.*

Nystad W et al. NOFE 2021

International and national collaboration

International consortiums on cardiovascular and non-communicable diseases include MORGAM, BIOMARCaRe, NCD risk factor collaboration, Global Burden of disease

Norwegian-Russian collaboration - parallel data collection in the Heart to Heart study 2015-2017

National Norwegian consortiums include CONOR and NCDNOR

Expanding national collaboration with NTNU-HUNT, NIPH, Cancer Registry of Norway

The Tromsø Study

NTNU HUNT forskningssenter

NIPH Norwegian Institute of Public Health

Cancer Registry of Norway

More than 200 ongoing research projects

- Cardiovascular disease
- Cancer
- Diabetes
- Environmental pollutants
- Microbial resistance
- Risk factors for disease
- Physical activity
- Diet
- Use of health care services
- Use of drugs

- Mental health
- Dental health
- Eye health
- Cognitive function and dementia
- Osteoporosis and fractures
- Renal disease
- Chronic pain
- Social inequality in health
- Pulmonary disease
- Musculoskeletal disorders

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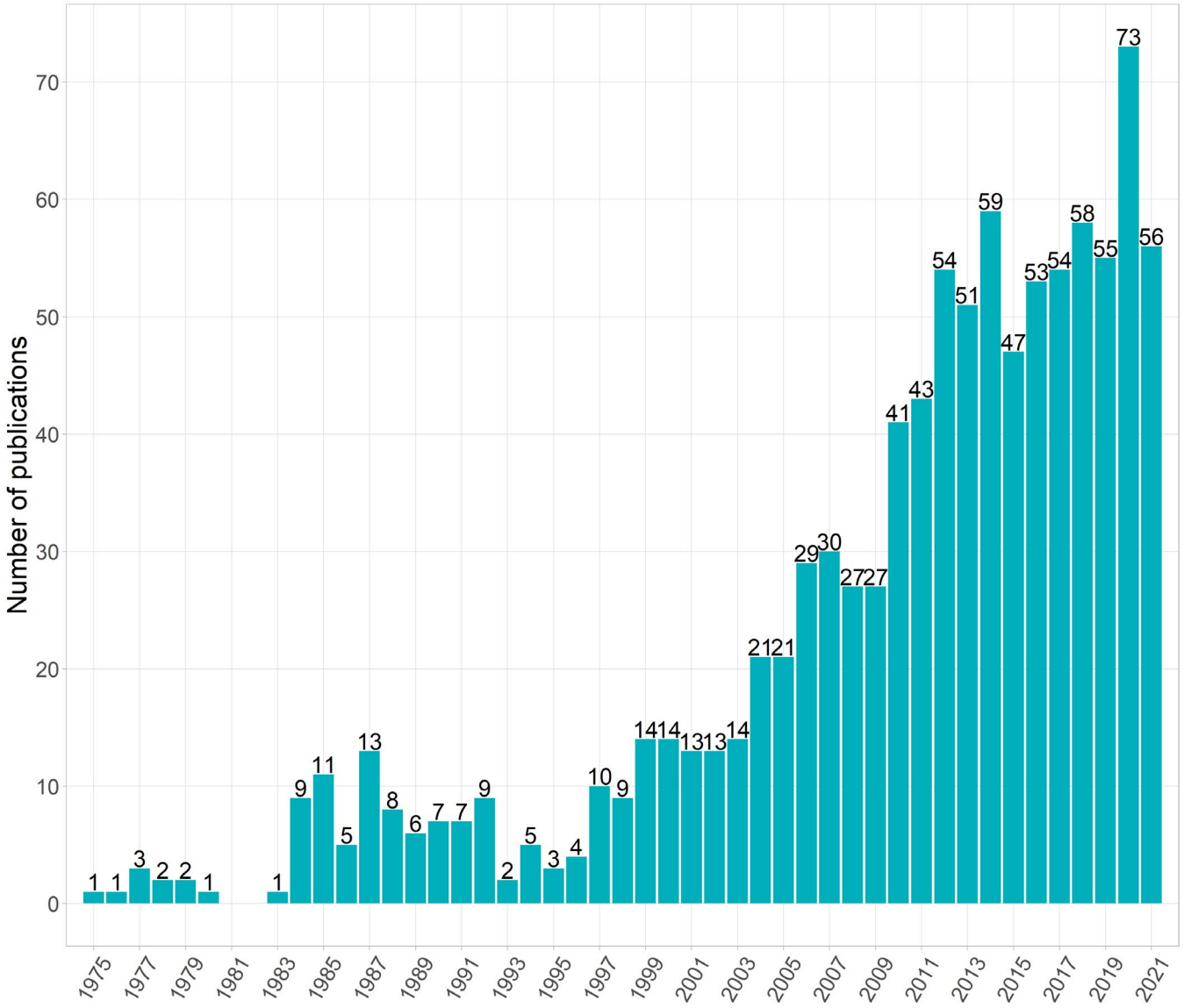
Scientific production

987 publications 1975-2021



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The greatest resource

The Tromsø Study

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The Tromsø Study contributes to

- Public health surveillance – risk factors and disease
- Updated knowledge for preventive efforts
- Building of academic competence in health care
- Regional, national and international research

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Tromsø8 is planned for 2024-25

Photo: Hanne Knudsen/www.nordnorge.com