

Trening = Medisin

Øivind Rognmo, dr.philos.



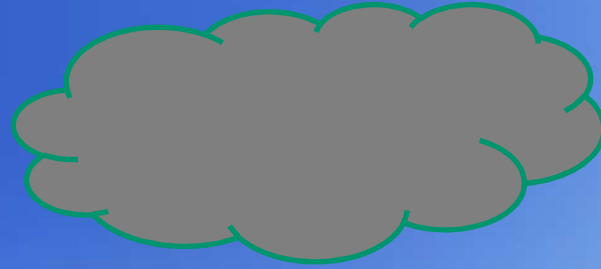
 ST. OLAVS HOSPITAL
UNIVERSITETSSYKEHUSET I TRONDHEIM



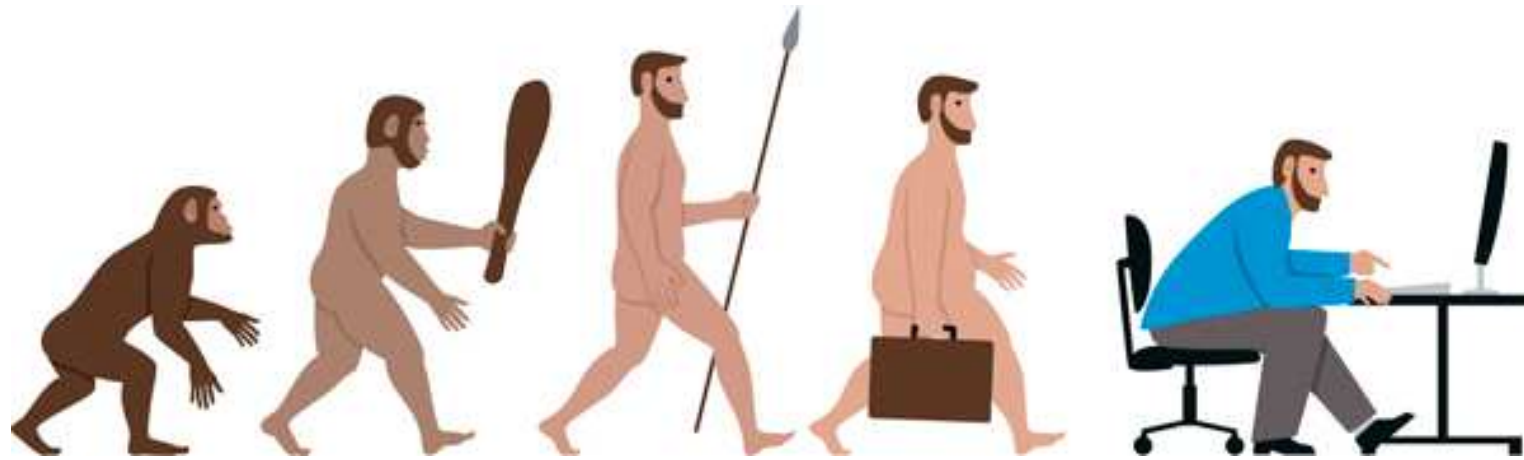
 NTNU
Det skapende universitet

 CERG
Cardiac Exercise Research Group

Helsestatus Norge: god, men...



Livsstilssykdommene: hjerte- og karsykdommer, diabetes, kols og kreft



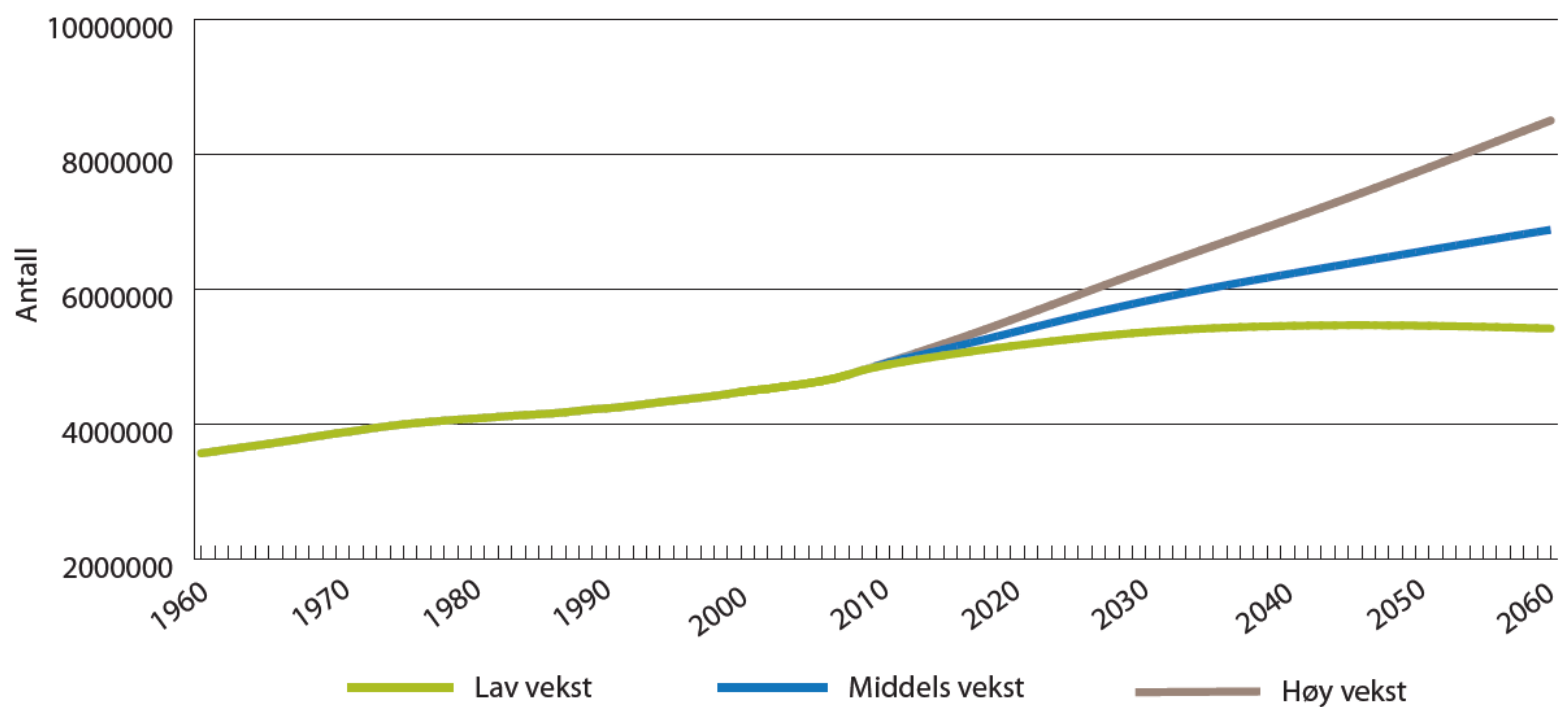
- Står for 70% av verdens dødsfall. Å redusere risikofaktorene tobaksbruk, usunt kosthold, fysisk inaktivitet og alkoholmisbruk, vil gi god beskyttelse.



Meld. St. 19
(2014–2015)
Melding til Stortinget

Folkehelsemeldingen
Mestring og muligheter

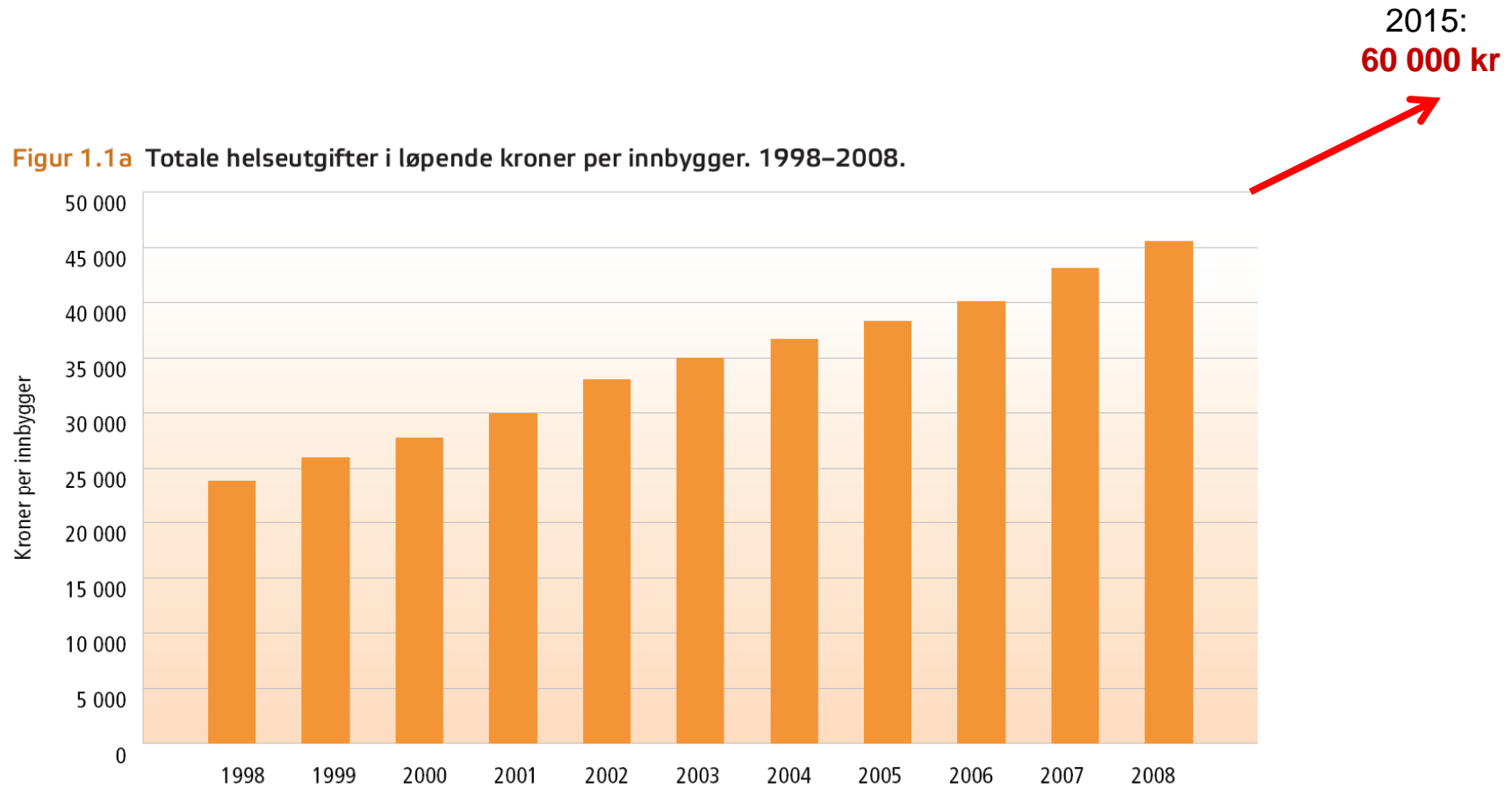
Befolkningsvekst og lengre levealder



Figur 1. Folkemengden 1960–2060.

Kilde: Statistisk sentralbyrå

Stigende helsekostnader



Kilde: Statistisk sentralbyrå. 2007 og 2008 er foreløpige tall.

Meld. St. 19

(2014–2015)

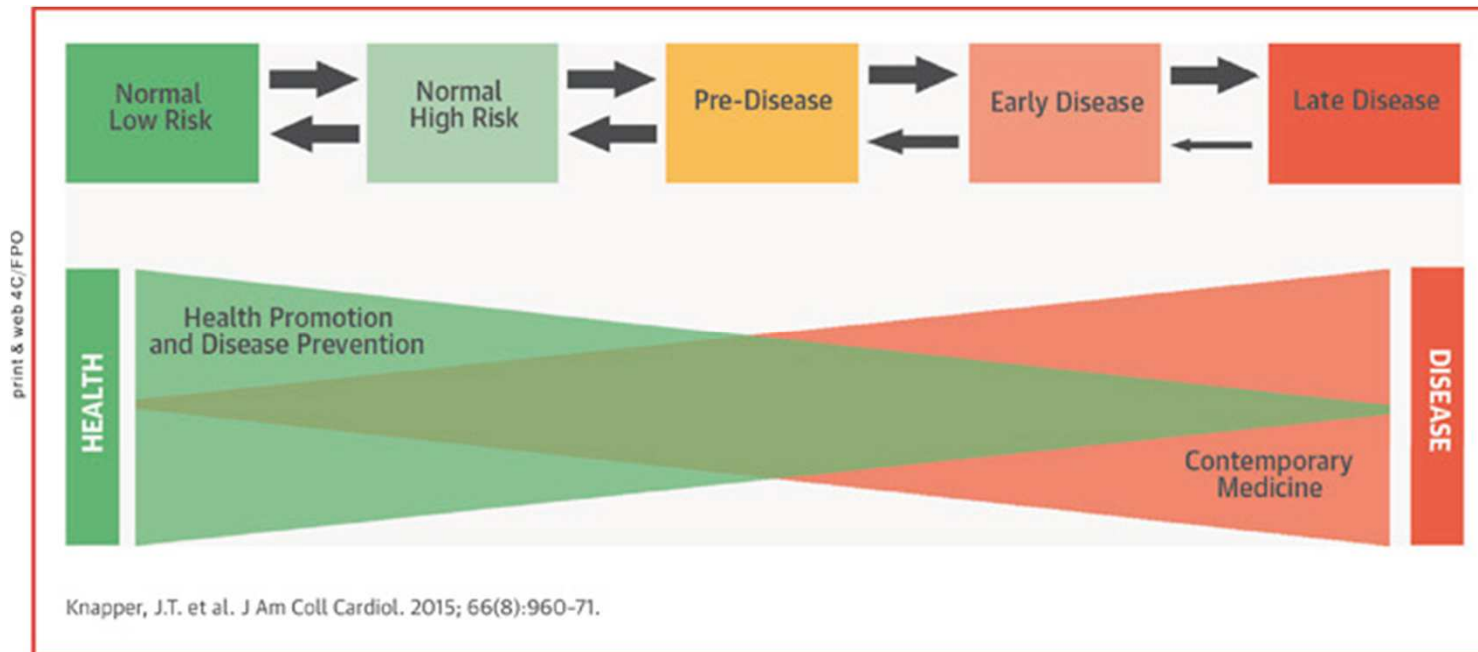
Melding til Stortinget

Folkehelsemeldingen

Mestring og muligheter

”Regjeringen vil styrke det forebyggende helsearbeidet”





Er treningsforskning viktig oppi dette?

- Inaktivitet er anslått å forårsake 9% av all for tidlig død i verden (5.5 mill)
- Like mange dødsfall som tobakk



=



www.thelancet.com Vol 380 July 21, 2012

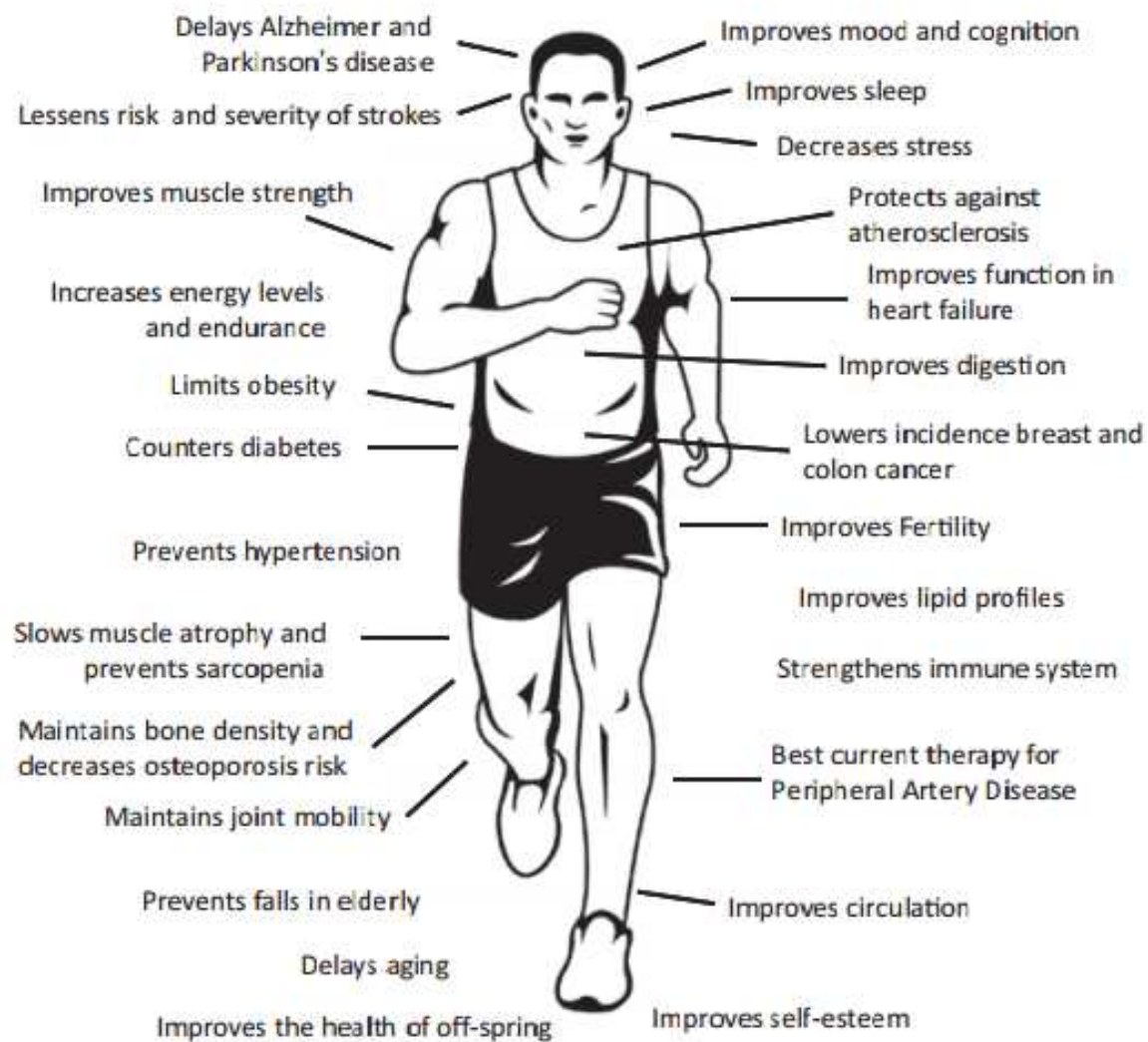


Figure 1. The many long-term benefits of regular endurance exercise.



Reflections on Physical Activity and Health: What Should We Recommend?

Review

Darren E.R. Warburton, PhD, and Shannon S.D. Bredin, PhD

Physical Activity Promotion and Chronic Disease Prevention Unit, University of British Columbia, Vancouver, British Columbia, Canada

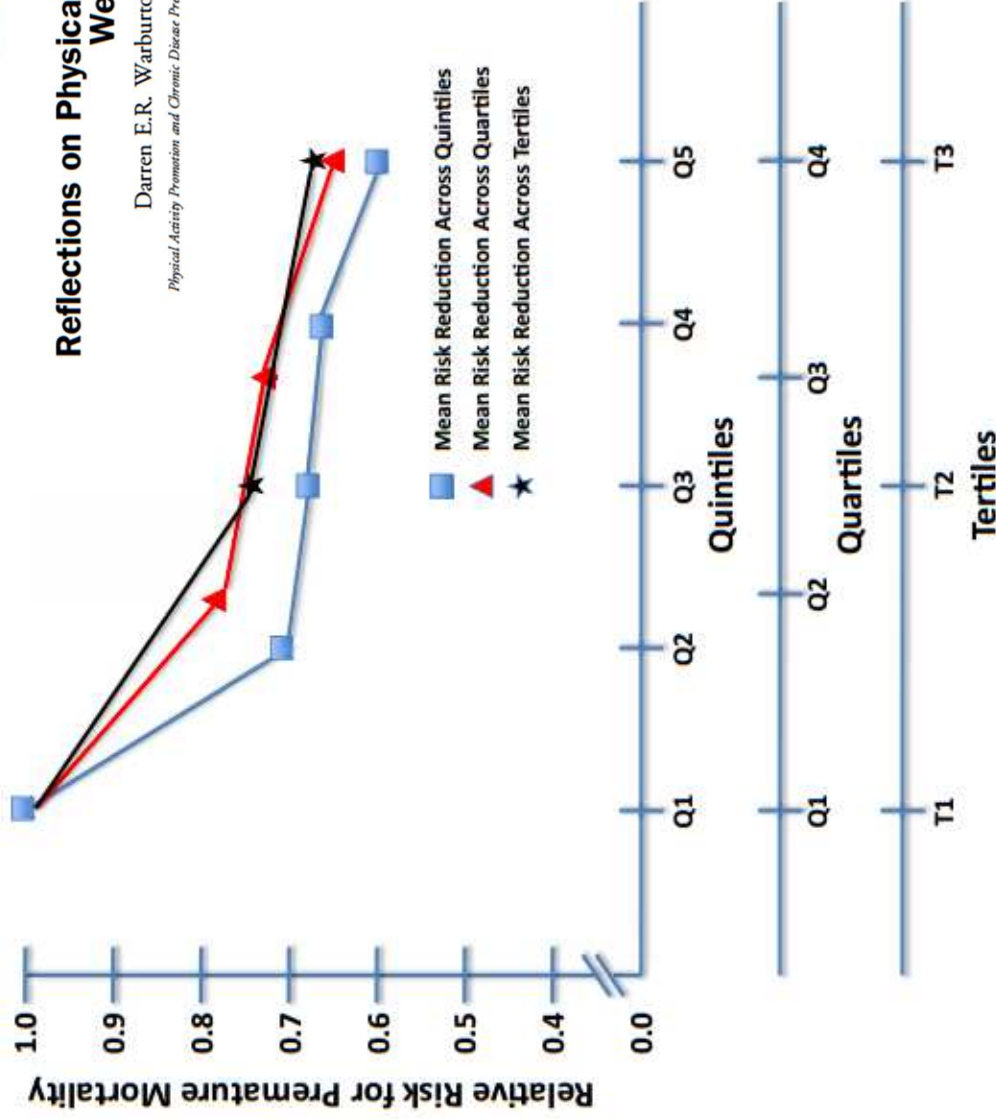


Figure 2. Relative risk for premature all-cause mortality across physical activity/fitness categories. Data were compiled from studies involving over 1.5 million participants, evaluated in a systematic review by Warburton et al.³

Trening = medisin

BMJ



BMJ 2013;347:f5577 doi: 10.1136/bmj.f5577 (Published 1 October 2013)

Page 1 of 14

RESEARCH

Comparative effectiveness of exercise and drug interventions on mortality outcomes: metaepidemiological study

 OPEN ACCESS

Huseyin Naci *researcher*¹ *fellow*², John P A Ioannidis *director*³

for:

Hjerte-/karsykdom
Behandling av hjertesvikt

Rehabilitering etter slag
Forebygging av diabetes

Verdien av fysisk aktivitet:



3 millioner kr

per nordmann

«Bare det å gå er så sunt at hvis to millioner nordmenn går ett kvarter mer hver dag i litt raskt tempo, vil det gi samfunnet en gevinst på 50 milliarder kroner i året».

Helsedirektoratet

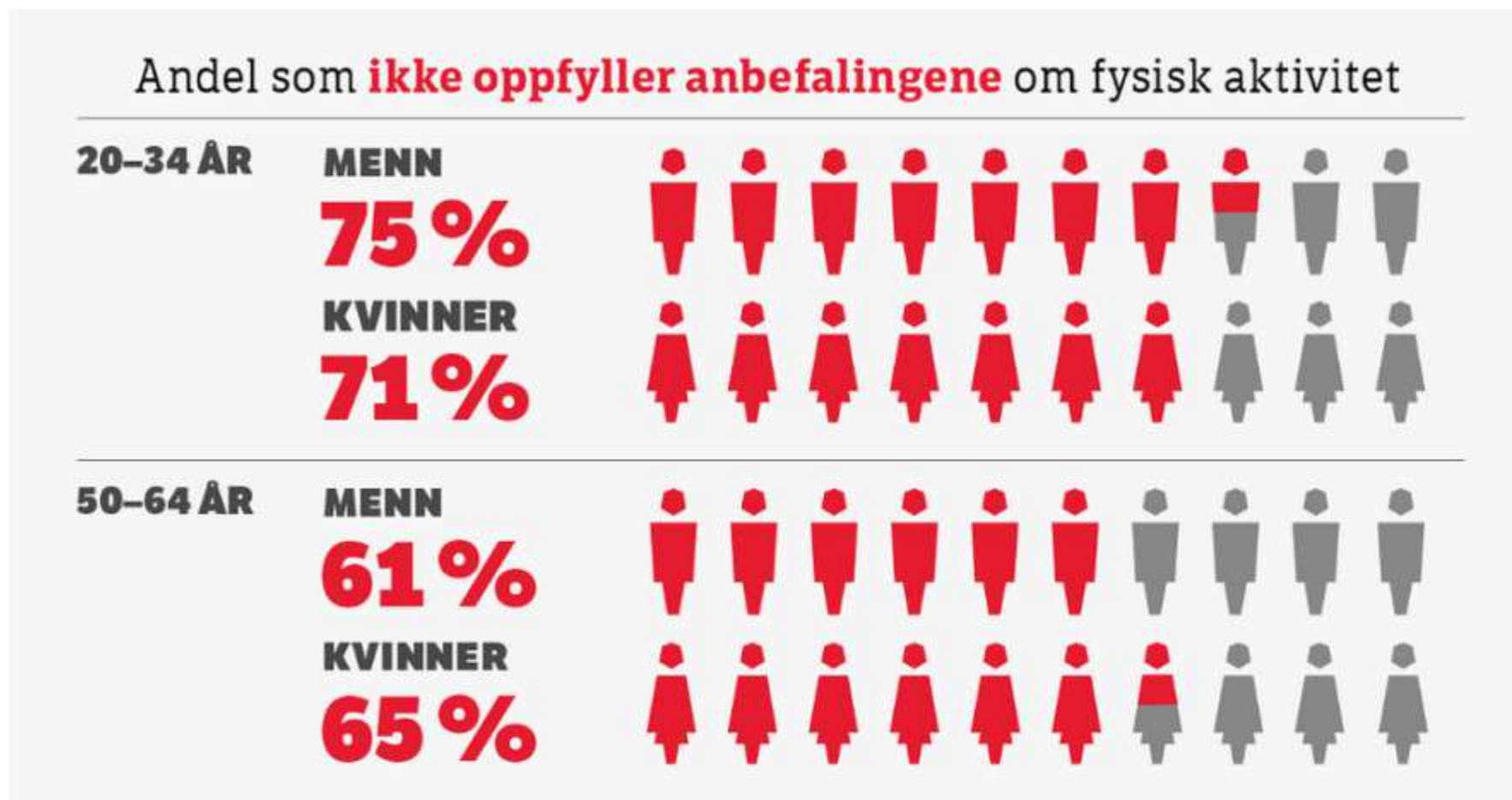


240 mrd



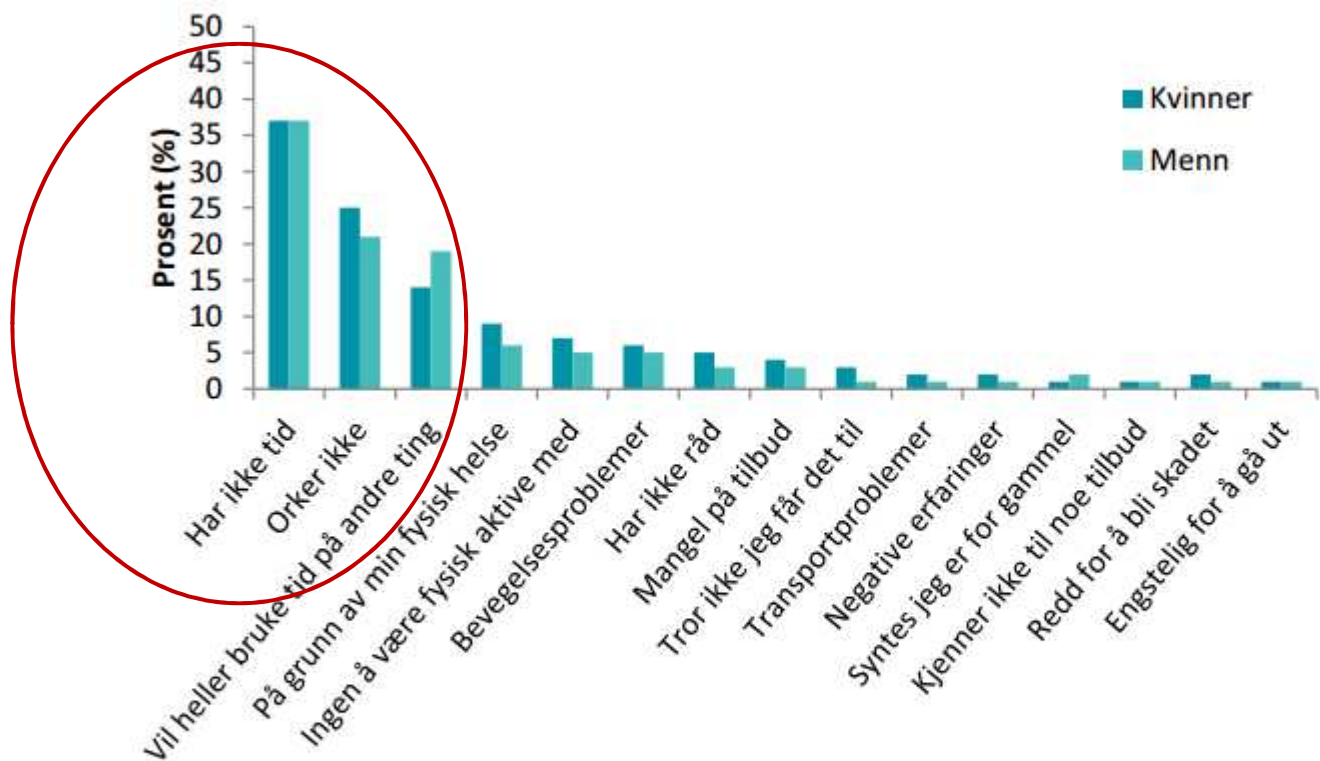
30 minutter hver dag

- Bare 1/3 oppfyller kravene om fysisk aktivitet



KILDE: HELSEDIREKTORATET

FOTO: MARI GRAFSRØNNINGEN / NRK



Figur 23. Oppgitte grunner for ikke å drive med fysisk aktivitet fordelt på kjønn. Tallene oppgis i prosent (%) (n=3020).

Tidsbesparende trening:

”Høyintensitetstrening virker mer effektivt på hjerte, kar og helse”



Friske
individer



Individer med
risiko for
hjertesykdom



Individer
med
hjertesykdom



Epidemiologiske studier



Kliniske studier



Eksperimentelle studier

Rapportert fysisk aktivitet og for tidlig død



Original Scientific Paper

A single weekly bout of exercise may reduce cardiovascular mortality: how little pain for cardiac gain? 'The HUNT study, Norway'

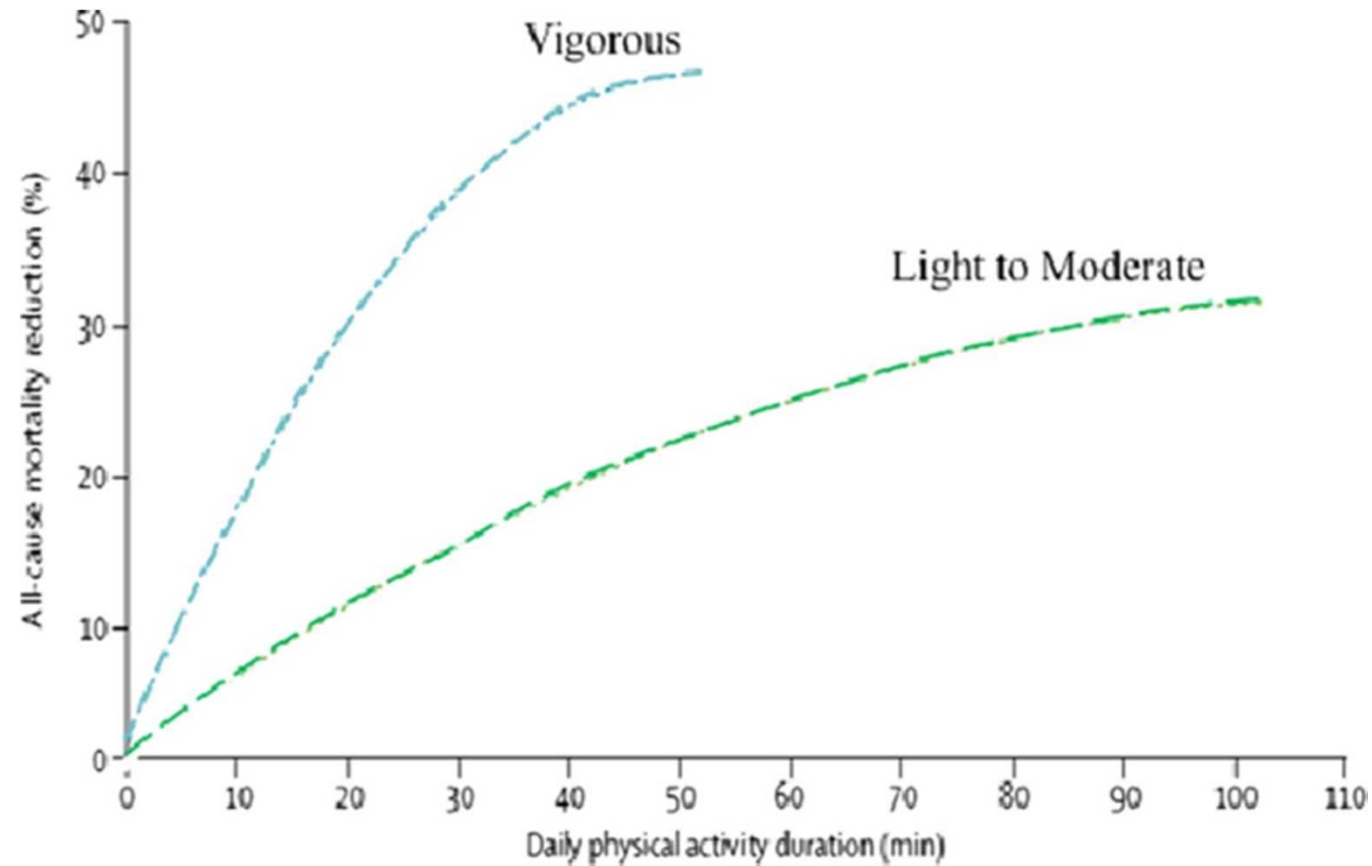
Ulrik Wisløff^{a,c}, Tom I.L. Nilsen^b, Wenche B. Drøyvold^b, Siv Mørkved^b, Stig A. Slørdahl^a and Lars J. Vatten^b

Departments of ^aCirculation and Medical Imaging, ^bPublic Health and General Practice, Norwegian University of Science and Technology, Trondheim, Norway and ^cDepartment of Cardiology, St Olav's Hospital, Trondheim, Norway.

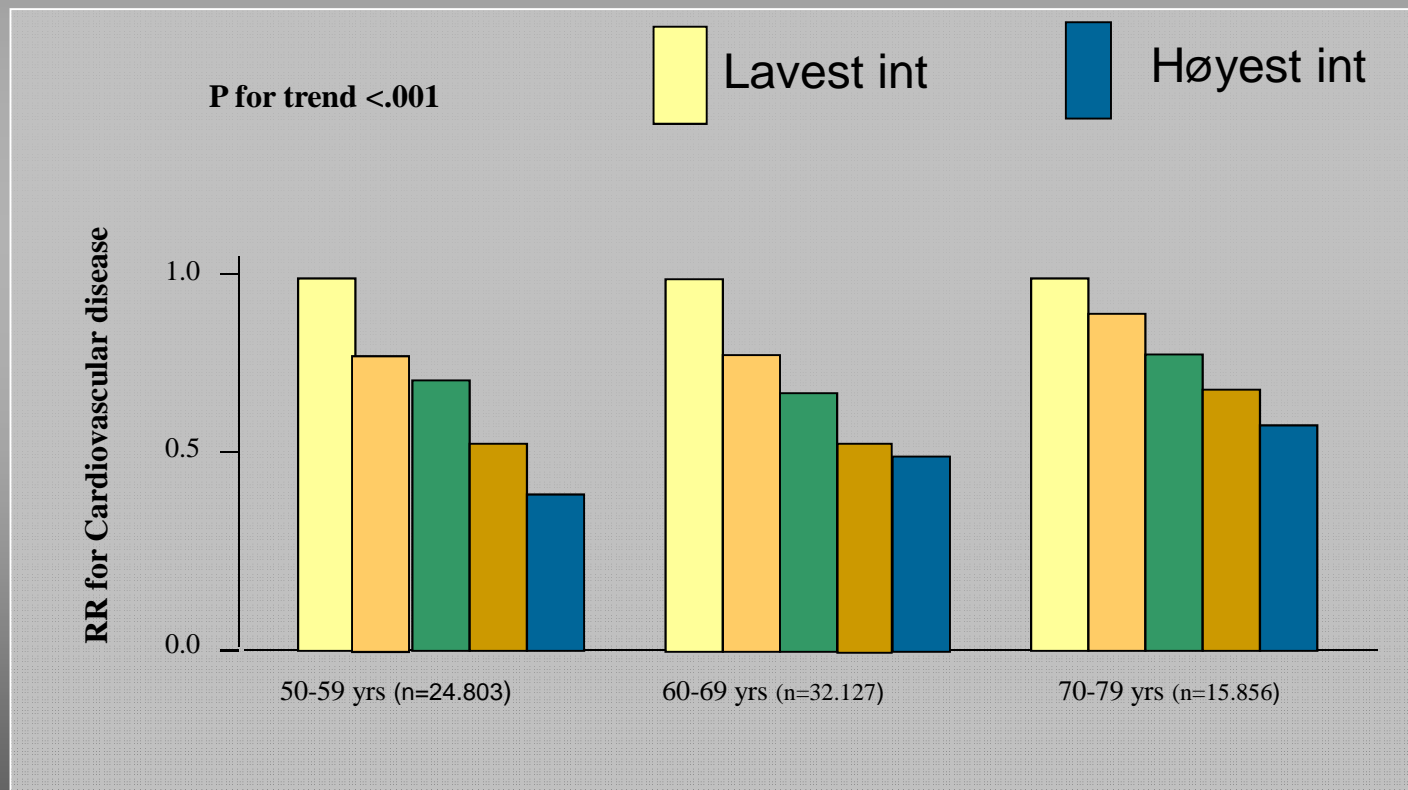
Received 20 January 2006 Accepted 23 February 2006

Én økt i uka der du blir anpusten var assosiert med 40% - 50% redusert dødelighet hos Nord-trønderne.

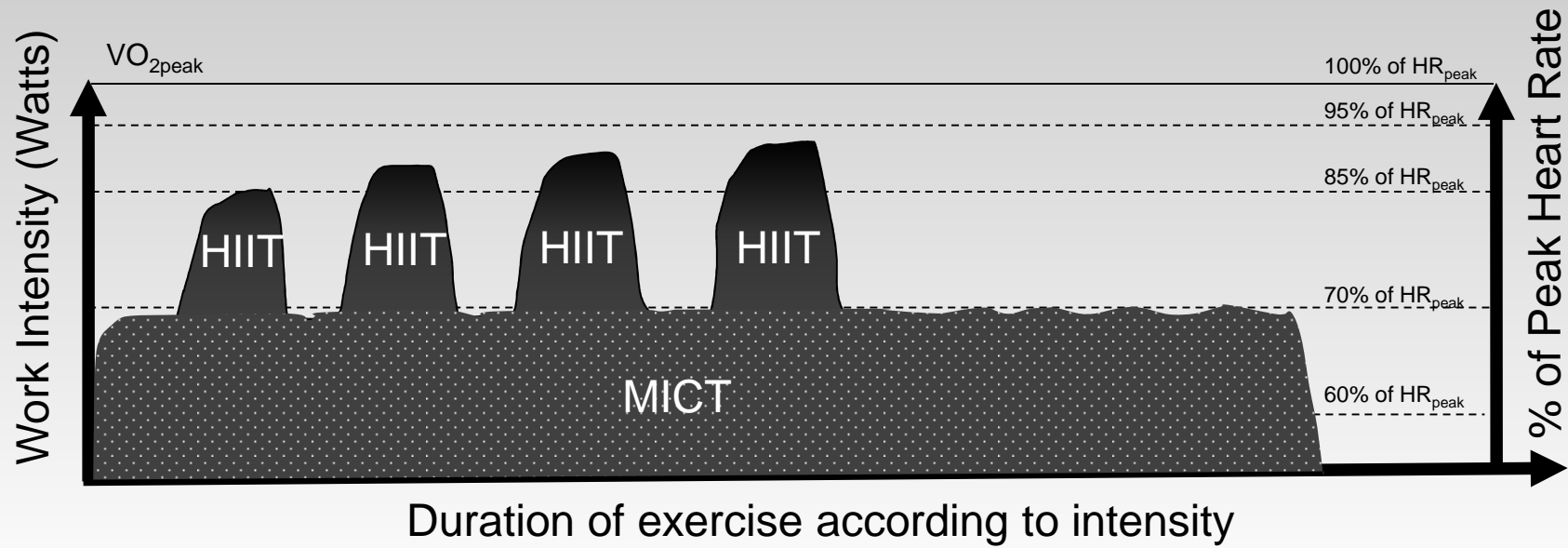
Daglig fysisk aktivitet og reduksjon av dødsrisiko



Høy intensitet er assosiert med redusert risiko for å bli hjertesyk

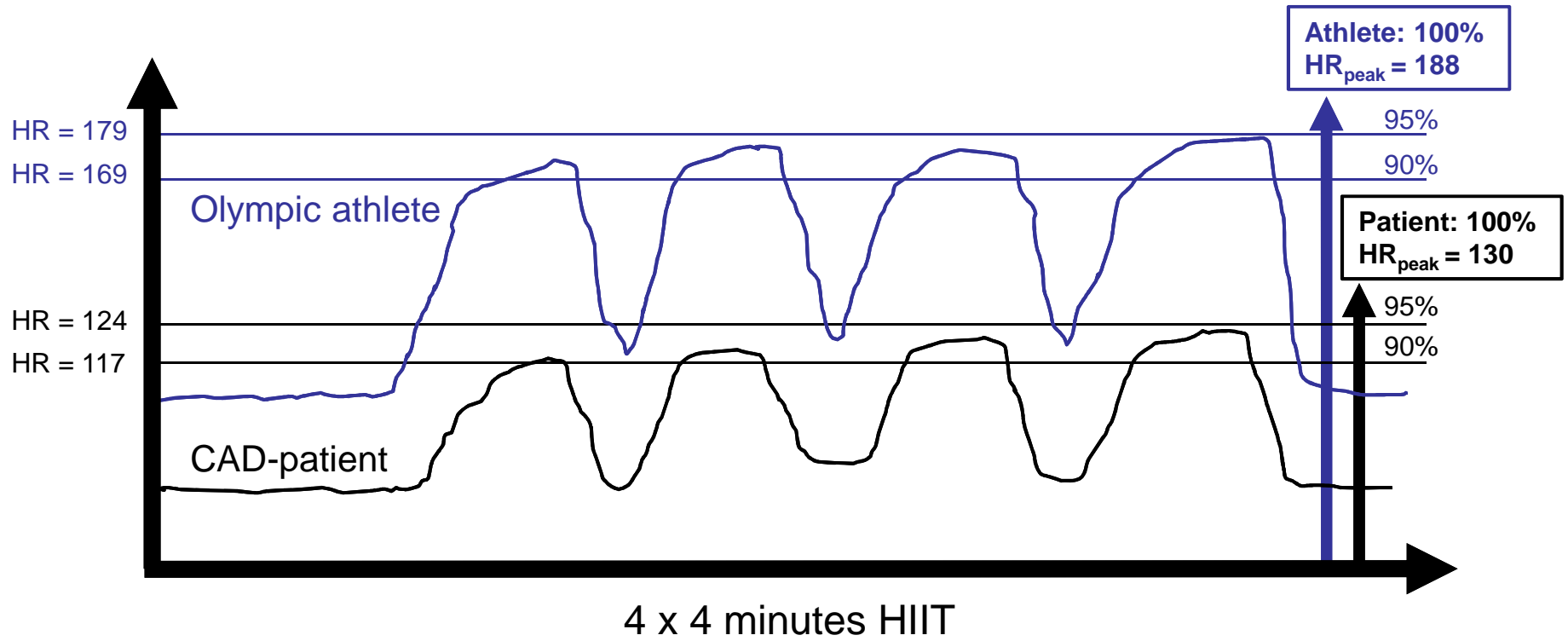


Hvordan trene?

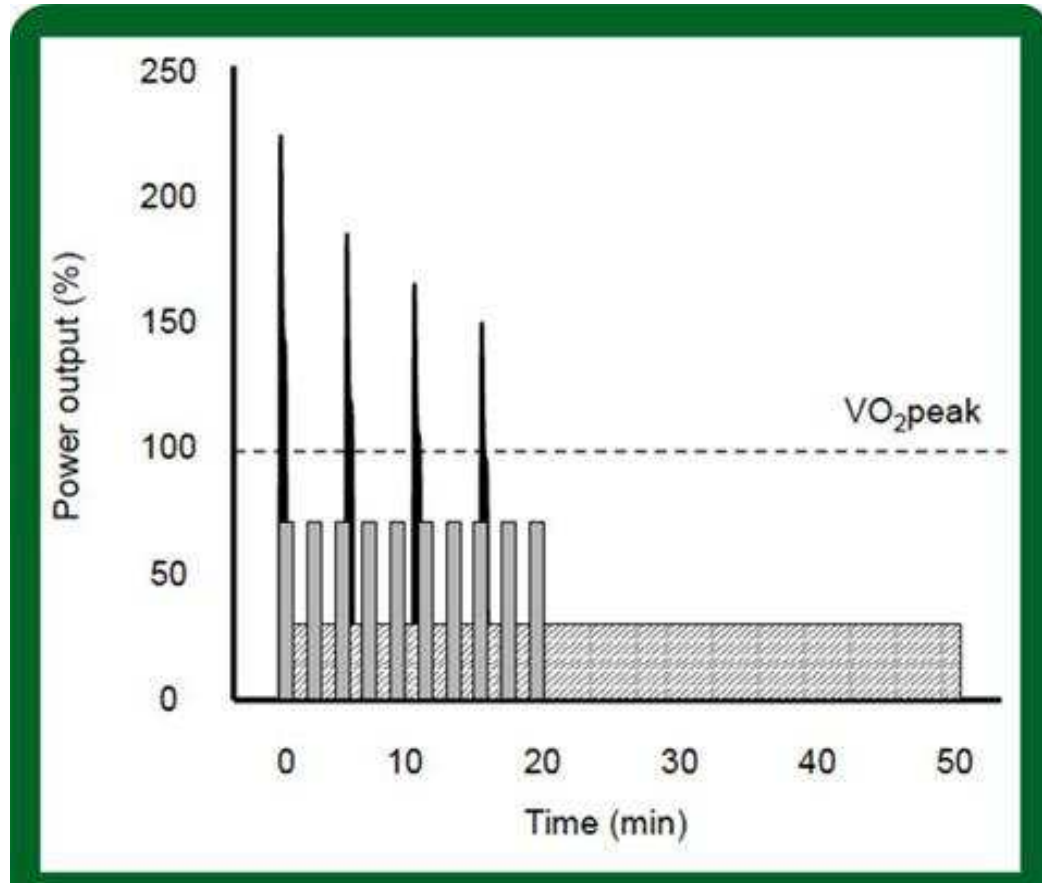


Absolute workload (Watts)

Relative workload



Enda lavere volum og høyere intensitet



Større effekter av HIIT enn moderat intensitet

- ↑ VO_2 peak
- ↓ Systolic and diastolic blood pressure
- ↑ High density lipoproteins
- ↓ Triglycerides and fasting glucose
- ↓ Oxidative stress and inflammation
- ↓ FATP-1 and FAS
- ↑ Adiponectin and insulin sensitivity
- ↑ PGC-1 α
- ↑ Maximal rate of Ca^{2+} reuptake
- ↑ Availability of nitric oxide
- ↑ Cardiac function
- ↑ Enjoyment of exercise
- ↑ Quality of life





The American Heart Association Recommendations for Physical Activity in Adults

At least 30 minutes of moderate-intensity aerobic activity **At least 5 days** per week for a **total of 150 minutes**

OR

At least 25 minutes of vigorous aerobic activity **At least 3 days** per week for a **total of 75 minutes**

or a combination of the two

Hva kan gjøres?



Best Investments for Physical Activity



Infographicalised by



1 Communication and public education

Consistent public education, including use of mass and social media



7 Sport and recreation

Sport systems and programs that promote "sport for all" and encourage participation across the life span



6 Community-wide programs

Work with communities to provide appropriate local solutions, aiming to mobilise large numbers of people



5 Education

Make regular physical activity in schools and places of learning normal



2 Transport and the environment

Transport policies and systems that prioritise walking, cycling and public transport



3 Urban design and infrastructure

Provide safe and equitable access for recreation and physical activity across the life course



4 Healthcare and health education

Ensure assessment and advice about physical activity is a routine part of healthcare services



We need action to achieve the goal of 10% increase in participation by 2025

Work together to make it happen

Global Advocacy Council for Physical Activity (GAPAC) the Advocacy Council of the International Society for Physical Activity and Health (ISPAH), NCD Prevention: Investments that Work for Physical Activity. Br J Sports Med 2012;46:870-5, 7-12

International Society for Physical Activity and Health

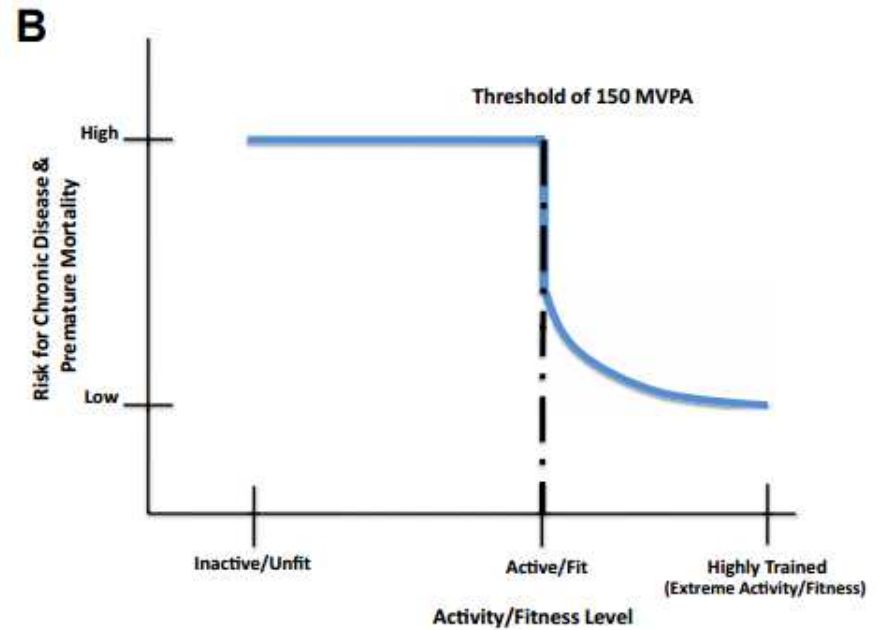
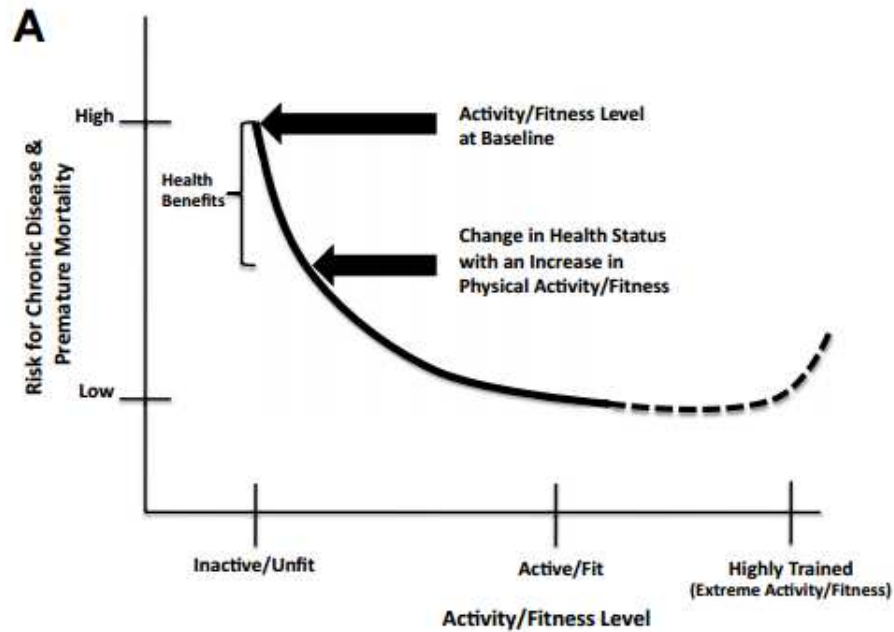
Designed by Chloe Schiphorst

British Journal of Sports Medicine 2016

Formidler vi riktig?

498

Canadian Journal of Cardiology
Volume 32 2016



Physical activity in relation to urban environments in 14 cities worldwide: a cross-sectional study

James F. Sallis, Ester Cerin, Terry L. Conway, Merr. A. Adams, Lawrence C. Frank, Michael Pratt, Deborah Salvo, Jaques Skragg, Carole Smith, Kelly L. Cain, Rachel Dooney, Jacqueline Kerr, Patsy-Chen Lai, Jiefei Ma, Kelly Madsen, Roger S. Mennis, Grant Siskind, Jim Troiano, Lillian Van Dyk, De-De Woodruff, Neville Owen



Summary

Background Physical inactivity is a global pandemic responsible for over 5 million deaths annually through its effects on multiple non-communicable diseases. We aimed to document how objectively measured attributes of the urban environment are related to objectively measured physical activity, in an international sample of adults.

Methods We based our analyses on the International Physical Activity and Environment Network (IPEN) adult study, which was a coordinated, international, cross-sectional study. Participants were sampled from neighbourhoods with varied levels of walkability and socioeconomic status. The present analyses of data from the IPEN adult study included 6822 adults aged 18–66 years from 14 cities in ten countries on five continents. Indicators of walkability, public transport access and park access were assessed in 1.0 km and 0.5 km street network buffers around each participant's residential address with geographic information systems. Mean daily minutes of moderate-to-vigorous-intensity physical activity were measured with 4–7 days of accelerometer monitoring. Associations between environmental attributes and physical activity were estimated using generalised additive mixed models with gamma variance and logarithmic link functions.

Results Four of six environmental attributes were significantly, positively, and linearly related to physical activity in the single variable models: net residential density (ep[95] 1.006 [95% CI 1.003–1.009; p=0.001], intersection density (1.146 [1.033–1.272]; p=0.000), mixed land use and distance to nearest public transport point (0.037 [0.018–0.056]; p=0.0007), and number of parks (0.001 [0.000–0.002]; p=0.000). Mean daily minutes of moderate-to-vigorous-intensity physical activity were not related to physical activity in physical activity between participants living in the lowest and least activity-friendly neighbourhoods ranged from 68 min/week to 89 min/week, which represents 45–59% of the 150 min/week recommended by guidelines.

Interpretation Design of urban environments has the potential to contribute substantially to physical activity. Similarity of findings across cities suggests the promise of engaging urban planning, transportation, and parks sectors in efforts to reduce the health burden of the global physical inactivity pandemic.

Funding Funding for coordination of the IPEN adult study, including the present analysis, was provided by the National Cancer Institute of National Institutes of Health (CA127296) with studies in each country funded by different sources.

Introduction

Physical inactivity is a global pandemic, responsible for more than 5 million deaths per year and is one of the UN's primary targets to reduce non-communicable diseases.^{1,2} Improvements to urban environments to facilitate physical activity for transportation and recreation is a recommended strategy.^{3,4}

People who live in walkable neighbourhoods that are densely populated, have interconnected streets, and are close to shops, services, restaurants, public transport,

and parks, tend to be more physically active than residents of less walkable areas.⁵ Studies of built environments and physical activity have been criticised for being done in only a few countries,^{6,7} not capturing all types of urban environment, and relying on self-reported environmental measures. International studies are needed to represent the full range of environmental variability. If findings are generally applicable across countries, then built environment interventions are

Methods

Study design and neighbourhood selection The International Physical Activity and Environment Network (IPEN) adult study was a multinational cross-sectional epidemiological study with the same design and similar methods described in detail elsewhere.⁸ The study included participants from 17 cities in 12 countries: Australia (Adelaide), Belgium (Ghent), Brazil (Curitiba), Copenhagen, Denmark (Copenhagen), Germany (Düsseldorf), Greece (Athens), Hong Kong, India (Chennai), Italy (Florence), Japan (Tokyo), Korea (Seoul), Mexico (Mexico City), Netherlands (Amsterdam), New Zealand (Auckland), Norway (Oslo), Singapore, South Africa (Cape Town), Sweden (Stockholm), Switzerland (Zürich), Taiwan (Taipei), Thailand (Bangkok), United Kingdom (London), United States (San Francisco), and the United States (Seattle). The study was approved by the ethics committees of all participating institutions.

Participants were recruited through a variety of methods, including door-to-door, community events, and social media. The study was conducted between 2010 and 2012.

ISSN 2474-2859 | DOI: 10.1136/bmj-2013-007111

Published online: April 1, 2013

Copyright © 2013 BMJ Group

All rights reserved. No reuse allowed without permission.

This article published in the *British Medical Journal* on April 1, 2013.

For information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

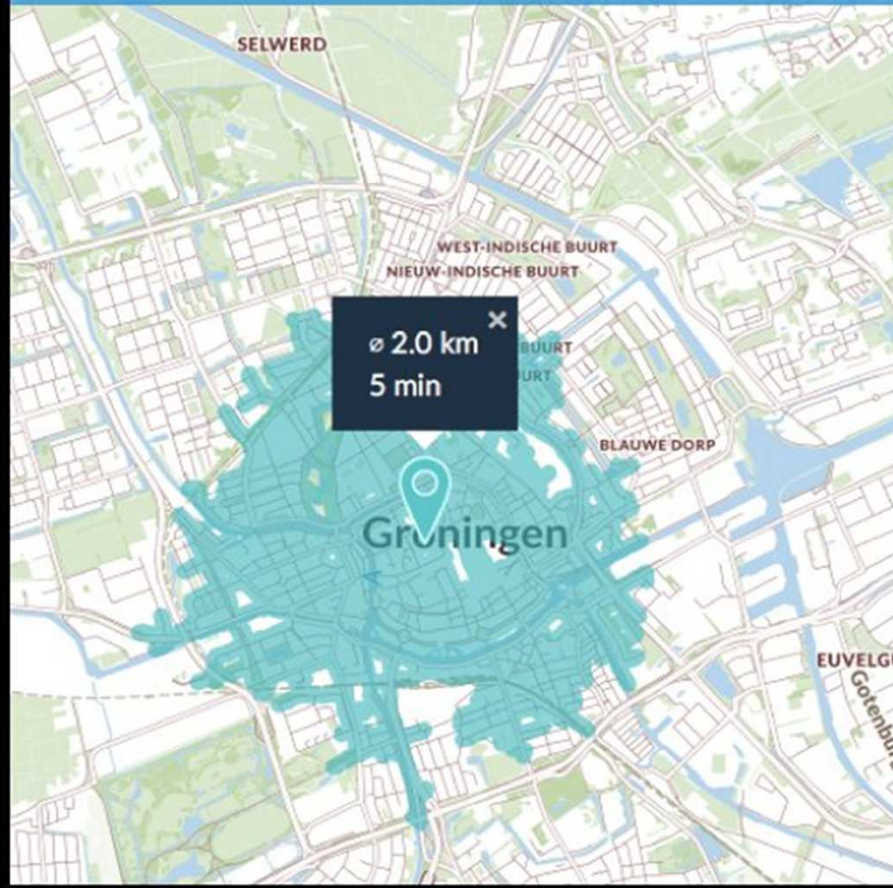
For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

For more information on this article please go to the journal website at www.bmj.com.

GRONINGEN



BERLIN



Mer attraktivt å gå



Campus og byutvikling

NTNU skal i 2025 ha en campus som er:

Samlende, Effektiv, Urban, Bærekraftig, Et levende laboratorium, Et nettverk av knutepunkt







Trening = Medisin
- fra vugge til grav