



University of Zurich

Institute of Social and Preventive Medicine

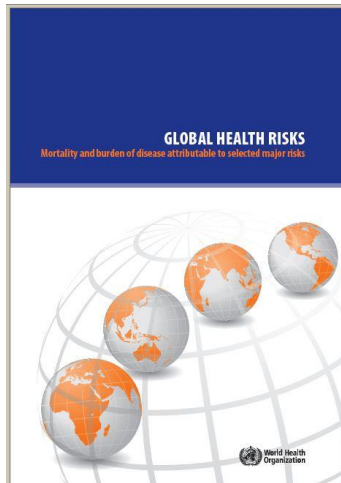
# The role of cohort studies for NCD prevention and health promotion – the role of Physical Activity

Brian Martin, MD MPH  
Physical Activity and Health Unit, Institute of Social and Preventive Medicine

*Indo-Swiss Symposium on Cohorts and Biobanks with Special Reference to Chronic Non-Communicable Diseases, SCIMST, Trivandrum, Kerala, India, 27.01.2012*

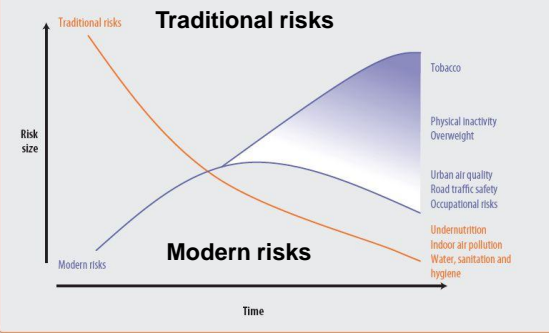
## The role of cohort studies for NCD prevention and health promotion – the role of Physical Activity

- Why NCD and why Physical Activity?
- Why cohort studies?
- Why India and Switzerland?
- How can we make progress?

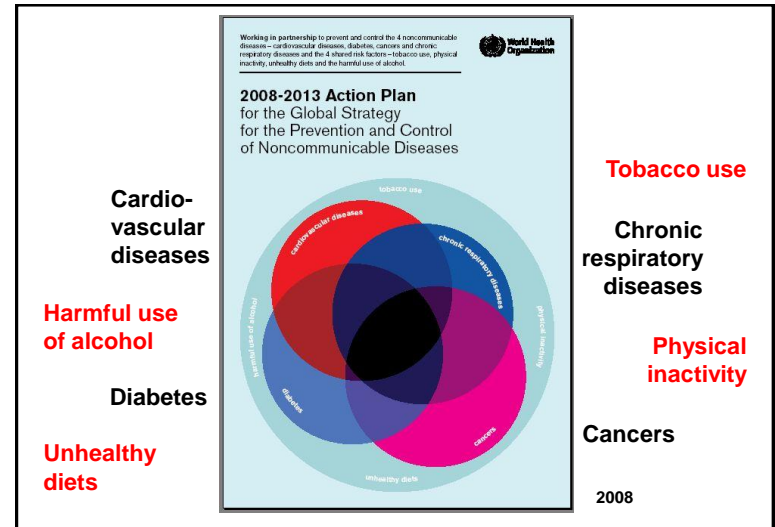
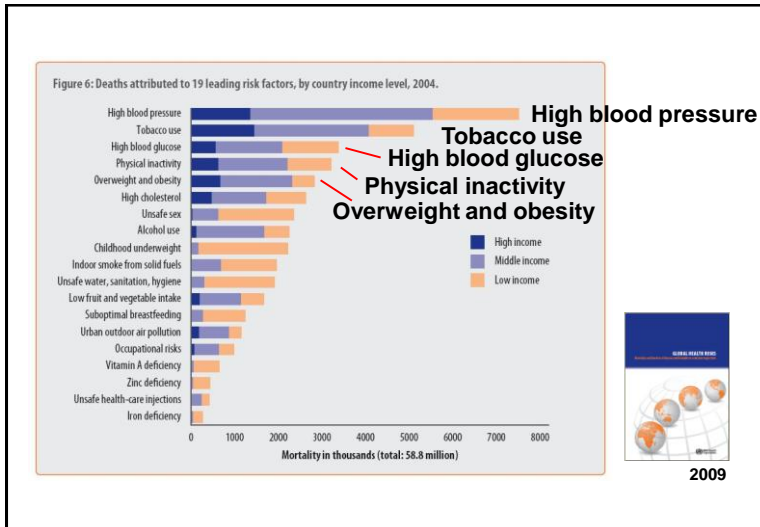


2009

Figure 2: The risk transition. Over time, major risks to health shift from traditional risks (e.g. inadequate nutrition or unsafe water and sanitation) to modern risks (e.g. overweight and obesity). Modern risks may take different trajectories in different countries, depending on the risk and the context.



2009



The NCD Alliance  
Putting non-communicable diseases on the global agenda

The NCD Alliance was founded by:  
International Diabetes Federation, WORLD HEART FEDERATION, IACC, International Union Against Tuberculosis and Lung Disease

Home Contact Us

Search this site

WHO WE ARE | NCD FACTS | WORK STREAMS | RESOURCES | GET INVOLVED | NEWSROOM | EVENTS

Sign Up to Receive the Latest Updates on the NCD Alliance and Global NCD Campaign

WORK STREAMS

- Advocacy Campaigns
- Global NCD Targets
- NCD Alliance Policy Series
- Working Groups
- A United Nations Summit on NCDs

FAQ: Learn More about the UN Summit on NCDs

Pour en savoir davantage sur le Sommet de l'ONU sur les maladies non transmissibles

### Types of evidence for Public Health

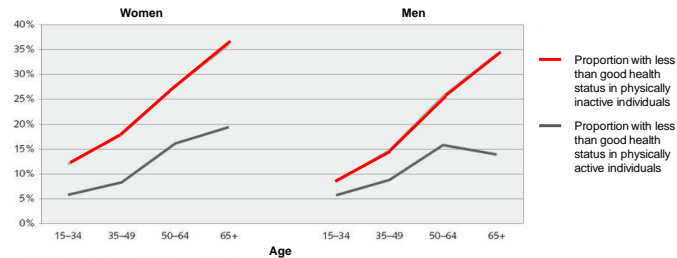
**Type I evidence**  
Disease ← risk factor (e.g. physical inactivity)  
“Why should something be done?”

**Type II evidence**  
Intervention → prevalence of risk factor  
“What should be done?”

Cavill et al 2005, adapted from Brownson et al 1999

## Physical Activity and Subjective Health Status in the Swiss Health Survey 2002

Anteile der Frauen und Männer mit höchstens mittelmässigem Gesundheitszustand unter den körperlich Aktiven und den Inaktiven, nach Alter G 13



Quelle: BFS, Schweizerische Gesundheitsbefragung 2002, n=18'715. Prozent der Antworten «mittelmässig», «schlecht» und «sehr schlecht» auf die Frage: «Wie geht es Ihnen zur Zeit gesundheitlich?».

© Bundesamt für Statistik (BFS)

Lamprecht M, Stamm HP. Bewegung, Sport, Gesundheit. Fakten und Trends aus den Schweizerischen Gesundheitsbefragungen 1992, 1997, 2002. StatSanité, Resultate zu den Gesundheitsstatistiken in der Schweiz, 1/2006.

## Cross-sectional study designs

Anteile der Frauen und Männer mit höchstens mittelmässigem Gesundheitszustand unter den körperlich Aktiven und den Inaktiven, nach Alter G 13



Quelle: BFS, Schweizerische Gesundheitsbefragung 2002, n=18'715. Prozent der Antworten «mittelmässig», «schlecht» und «sehr schlecht» auf die Frage: «Wie geht es Ihnen zur Zeit gesundheitlich?».

© Bundesamt für Statistik (BFS)

## The INTERHEART Study

Effect of potentially modifiable risk factors associated with myocardial infarction in 51 countries: case-control study (n=15'152+14'820)

Risk factor	Sex	Control (%)	Case (%)	Odds ratio (99% CI)
Exercise	F	16.5	9.3	0.48 (0.39-0.59)
	M	20.3	15.8	0.77 (0.69-0.85)

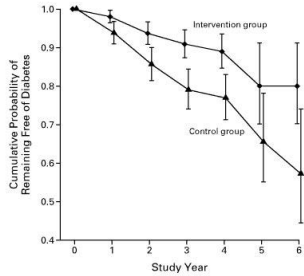
Lancet 2004; 364: 937-52

## Case-control designs

Risk factor	Sex	Control (%)	Case (%)	Odds ratio (99% CI)
Exercise	F	16.5	9.3	0.48 (0.39-0.59)
	M	20.3	15.8	0.77 (0.69-0.85)

Important challenge: recall bias in retrospective exposure assessment!

**Tuomilehto J et al. Prevention of Type 2 Diabetes Mellitus by Changes in Lifestyle among Subjects with Impaired Glucose Tolerance**



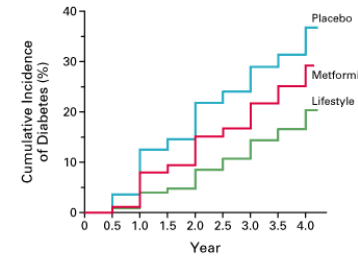
**Figure 1. Proportion of Subjects without Diabetes during the Trial.**  
The vertical bars show the 95 percent confidence intervals for the cumulative probability of remaining free of diabetes. The relative risk of diabetes for subjects in the intervention group, as compared with those in the control group, was 0.4 (P<0.001 for the comparison between the groups).

SUBJECTS AT RISK

Total no.	507	471	374	167	53	27
Cumulative no. with diabetes:						
Intervention group	5	15	22	24	27	27
Control group	16	37	51	53	57	59

N Engl J Med 2001;  
344 (18): 1343-1350

**Diabetes Prevention Program Research Group. Reduction in the Incidence of Type 2 Diabetes with Lifestyle Intervention or Metformin**

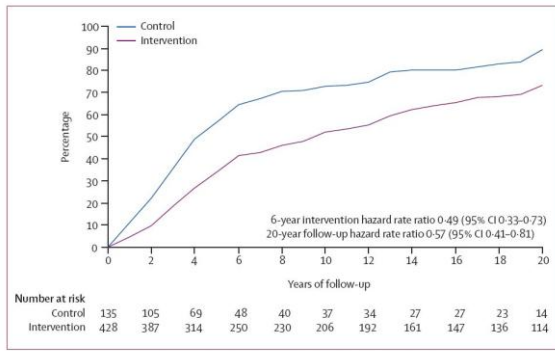


N Engl J Med 2002;  
346 (6): 393-403

**Figure 2. Cumulative Incidence of Diabetes According to Study Group.**

The diagnosis of diabetes was based on the criteria of the American Diabetes Association.11 The incidence of diabetes differed significantly among the three groups (P<0.001 for each comparison).

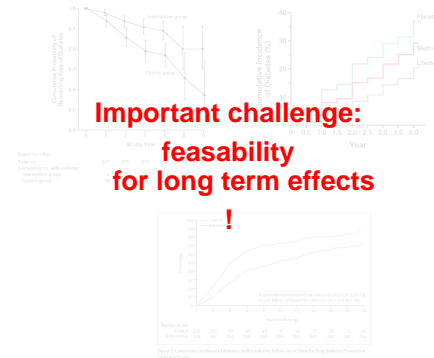
**The long-term effect of lifestyle interventions to prevent diabetes: a 20-year follow-up study**



Guangwei L et al. Lancet 2008;  
371: 1783-89

Figure 2: Cumulative incidence of diabetes mellitus during follow-up in China Da Qing Diabetes Prevention Outcome Study

**Randomised controlled trials**



## Cohort studies

- Ideal for study of long term effects on NCD outcomes
- Allow to study temporal sequence of exposure and potential outcomes
- Allow to study changes in exposure
- May allow nested case-control studies with prospective exposure assessment

4. Primary health care systems

5. Public education

6. Integrated community-wide programmes

7. „Sport for all“ systems and programmes

3. Urban design regulations and infrastructure

2. Transport policies and systems

1. „Whole-of-school“ programmes

NON COMMUNICABLE DISEASE PREVENTION:  
**Investments that Work for Physical Activity**  
A complementary document to  
The Toronto Charter for Physical Activity: A Global Call to Action

Whole-of-community approaches where people live, work and recreate have the opportunity to mobilize large numbers of people.

GAPA, a council of the International Society for Physical Activity and Health ISPAH  
[www.globalpa.org.uk](http://www.globalpa.org.uk)

## Type II evidence for physical activity and health

- Derived from intervention studies
- Possibility for nested intervention studies in cohorts
- Development and improvement of interventions based on studies of determinants of physical activity
- Cross-sectional study designs only provide information on correlates, longitudinal study designs on true determinants of physical activity behaviour

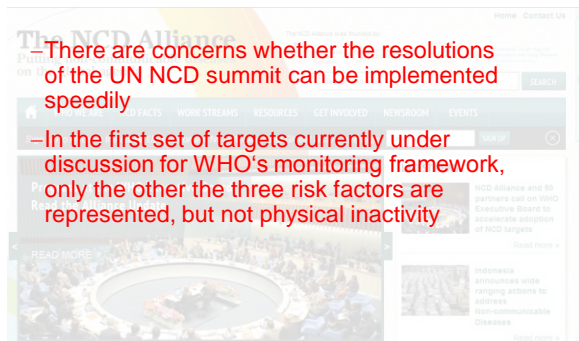
## “Why are some people physically active and others not? Understanding the Correlates of Physical Activity”

“The major limitation of the correlates literature is that the majority of studies used a cross-sectional design (...)”

Manuscript under development. Authors: Adrian E Bauman, Rodrigo Reis, James F Sallis, Jonathan Wells, Ruth Loos, Brian W Martin.

## Current developments in physical activity and health

–Despite first successes,  
more evidence-based advocacy is necessary



## Current developments in physical activity and health

–Despite first successes,  
more evidence-based advocacy is necessary

–Better methods for quantification of levels of physical activity and for assessment of different domains of physical activity\* are now available

- \*SLOTH: –Sleep  
–Leisure time activity  
–Occupational activity  
–Transport  
–Home-based activities

Pratt et al. American Journal of Preventive Medicine 2004

## Current developments in physical activity and health

–Despite first successes,  
more evidence-based advocacy is necessary

–Better methods for quantification of levels of physical activity and for assessment of different domains of physical activity are now available

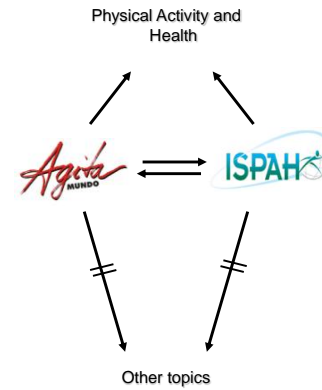
–More trans-cultural research in physical activity and health is necessary

## “Why are some people physically active and others not? Understanding the Correlates of Physical Activity”

	Reviews	Studies
– Demographic, psycho-social and behavioural correlates	18	772
– Environmental correlates in adults	42	?
– Environmental correlates in youth	1 (new)	103
– All correlate studies from LMIC	1 (new)	68

Manuscript under development. Authors: Adrian E Bauman, Rodrigo Reis, James F Sallis, Jonathan Wells, Ruth Loos, Brian W Martin.

## Specificity of actors in physical activity and health



www.agitamundo.org  
www.panh.ch/agitamundo

www.ispah.org

## Scientific Society on Physical Activity and Health

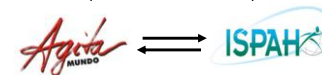


Other Councils



www.ispah.org

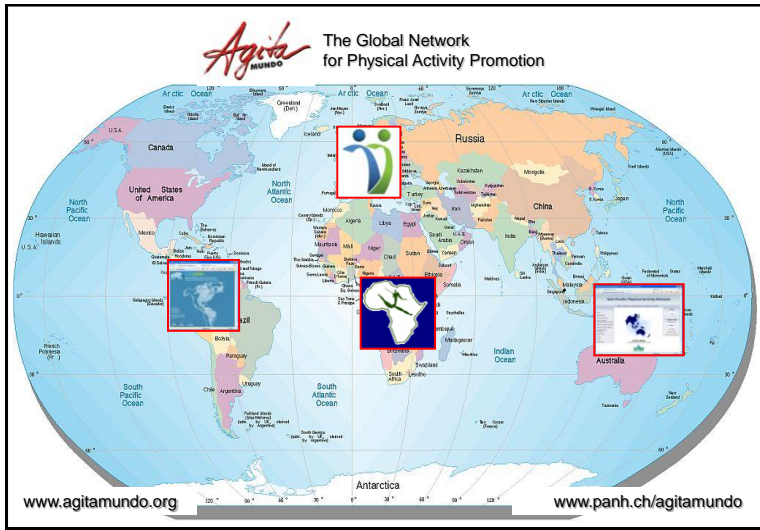
Physical Activity and Health













- PA promotion Network
- Institutional membership
- Multilingual
- Scientific society
- Individual membership
- English

www.agitamundo.org  
www.panh.ch/agitamundo

www.ispah.org



## Agita MUNDO Executive Board 2011-2012

	<b>Brian Martin</b> HEPA Europe; University of Zurich, Switzerland (Chairman)	
	Dubai Sports Council, United Arab Emirates	<b>Nasser Al Rahma</b>
	HEPA Europe; NISB, the Netherlands	<b>Eddy Engelsman</b>
	Department of Physiology, Kuwait University	<b>Jaseem Ramadan</b>
	Tokyo Medical University, Japan	<b>Shigeru Inoue</b>
	AFAPAN; University of Cape Town, South Africa	<b>Vicki Lambert</b>
	RAFA-PANA; CELAFISCS, Brazil	<b>Victor Matsudo</b> (Past Chairman)
	RAFA-PANA; CDC, USA	<b>Mike Pratt</b>
	American College of Sports Medicine ACSM	<b>Jim Whitehead</b>

### "Cardiovascular Disease Epidemiology and Physical Activity Research Methods Course" 18 – 24 May, 2011 JN HALL, Infosys technologies Ltd., Hebbal Electronic city, Mysore, Karnataka, India

Time	Topic	Speaker
18:00 - 18:30 PM	Registration	Dr. S. Thangappa
18:30 - 19:00 PM	Introduction and orientation	Dr. S. Thangappa
19:00 - 19:30 PM	Introduction to the course	Dr. S. Thangappa
19:30 - 20:00 PM	Introduction to the course	Dr. S. Thangappa
20:00 - 20:30 PM	Introduction to the course	Dr. S. Thangappa
20:30 - 21:00 PM	Introduction to the course	Dr. S. Thangappa
21:00 - 21:30 PM	Introduction to the course	Dr. S. Thangappa
21:30 - 22:00 PM	Introduction to the course	Dr. S. Thangappa
22:00 - 22:30 PM	Introduction to the course	Dr. S. Thangappa
22:30 - 23:00 PM	Introduction to the course	Dr. S. Thangappa
23:00 - 23:30 PM	Introduction to the course	Dr. S. Thangappa
23:30 - 24:00 PM	Introduction to the course	Dr. S. Thangappa

### The role of cohort studies for NCD prevention and health promotion – the role of Physical Activity

- Why NCD and why Physical Activity? Mortality and burden of disease ✓
- Why cohort studies? Health effects of PA and determinants research ✓
- Why India and Switzerland? Advocacy, better methods, trans-cultural research ✓
- How can we make progress? Research and policy partnerships ✓