University of Zurich[UZH]

Epidemiology, Biostatistics and Prevention Institute EBPI

Directorate of Economics and Health
Canton of Basel-Country
Liestal

Office of Public Health

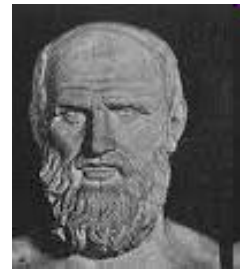
Physical Activity Promotion in the Context of Overall Health Policy

Brian Martin, MD MPH
Chief Medical Officer of the Canton of Basel-Country, Liestal, Switzerland
Epidemiology, Biostatistics and Prevention Institute EBPI, University of Zurich

The 28th Symposium of the International Council for Physical Acrivity and Fitness Research ICPAFR, 25.08.16, Kaunas, Lithuania

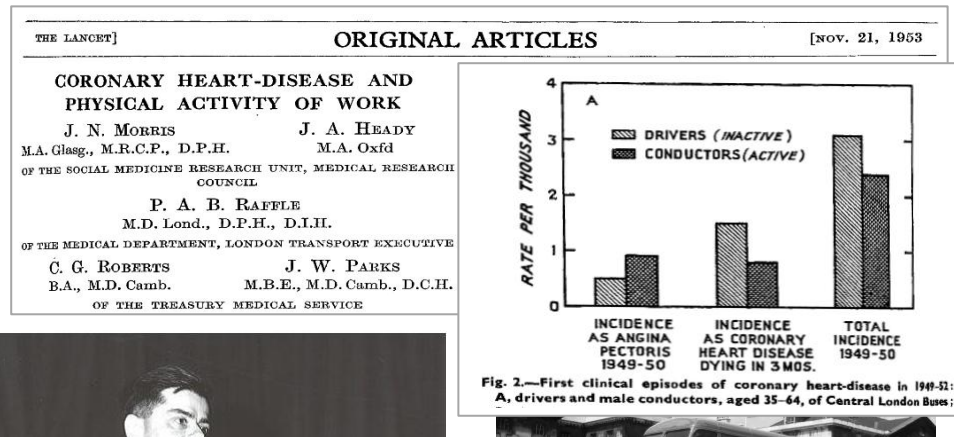
PA Promotion in the Context of Overall Health Policy

- What do we know about physical activity and health?
- What do we know about physical activity promotion?
- Physical activity in health policy
- Physical activity in overall health
- PA promotion in the context of overall health policy



"If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health"

Hippokrates ~460-370 BC



THE LANCET] ORIGINAL ARTICLES [NOV. 21, 1953

CORONARY HEART-DISEASE AND PHYSICAL ACTIVITY OF WORK

J. N. MORRIS M.A. Glasg., M.R.C.P., D.P.H.
J. A. HEADY M.A. Oxfd
OF THE SOCIAL MEDICINE RESEARCH UNIT, MEDICAL RESEARCH COUNCIL

P. A. B. RAFFLE M.D. Lond., D.P.H., D.I.H.
OF THE MEDICAL DEPARTMENT, LONDON TRANSPORT EXECUTIVE

C. G. ROBERTS B.A., M.D. Camb.
J. W. PARKS M.B.E., M.D. Camb., D.C.H.
OF THE TREASURY MEDICAL SERVICE

Fig. 2.—First clinical episodes of coronary heart-disease in 1949-52: A, drivers and male conductors, aged 35–64, of Central London Buses;

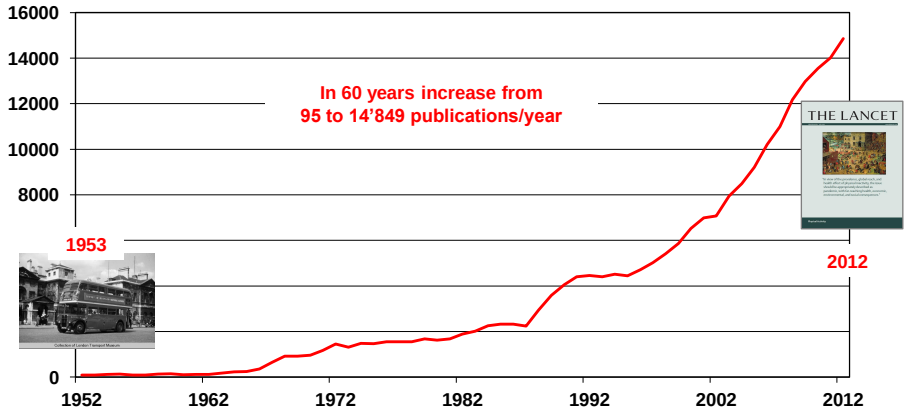
Morris addressing the 1954 World Conference of Cardiology in Washington DC

Collection of London Transport Museum

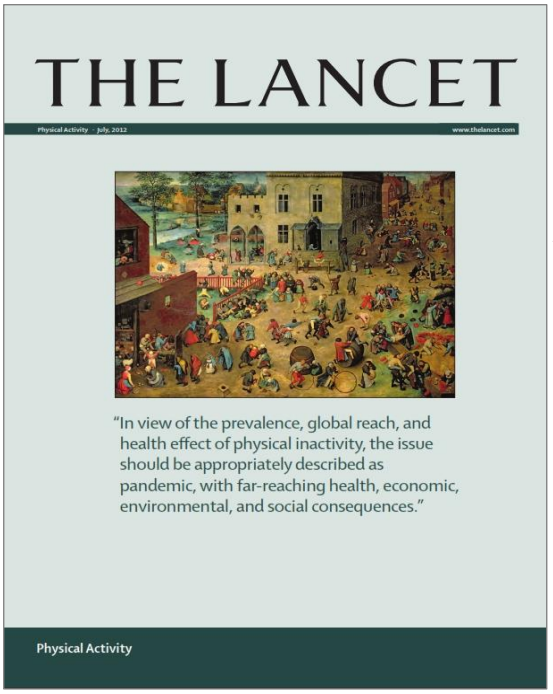
The Telegraph, 02.11.2009

Scientific Publications on Physical Activity in the Pubmed Database

MeSH terms „physical activity“ OR „exercise“ OR „sport“ OR „sports“



www.pubmed.org, 02.10.13



The Lancet Physical Activity Series Working Group

33 scientists from 16 countries

July 2012

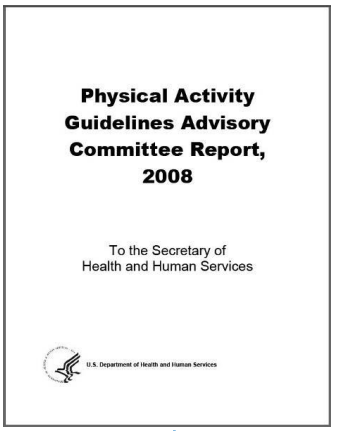
Panel 1: **Health benefits of physical activity in adults**[3-5]

Strong evidence of reduced rates of:

- All-cause mortality
- Coronary heart disease
- High blood pressure
- Stroke
- Metabolic syndrome
- Type 2 diabetes
- Breast cancer
- Colon cancer
- Depression
- Falling

Strong evidence of:

- Increased cardiorespiratory and muscular fitness
- Healthier body mass and composition
- Improved bone health
- Increased functional health
- Improved cognitive function



Recommendations

USA 2008 WHO 2010

Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT, for the Lancet Physical Activity Series Working Group. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. Lancet. 2012 Jul 21;380(9838):219-29.

Panel 1: **Health benefits of physical activity in adults**[3-5]

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- Healthier body mass and composition
- Improved bone health
- Increased functional health
- Improved cognitive function

conservative assumptions

↓

calculation of burden of disease ← physical inactivity

- 6% to 10% of cases for these diseases worldwide
- 9% of premature mortality worldwide (5.3 million deaths)

~ comparable to worldwide effects of smoking or obesity

Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT, for the Lancet Physical Activity Series Working Group. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. Lancet. 2012 Jul 21;380(9838):219-29.

Scientifically proven health effects of physical activity

Health impact of physical activity in children and adolescents			
Cardiovascular endurance	↑	Risk profile for cardiovascular diseases	↓
Muscle power	↑	Risk profile for metabolic disorders	↓
Healthy body weight	↑	Anxiety-related symptoms	↓
Bone healths	↑	Depressive symptoms	↓
In adults			
Life expectancy	↑	Cardiovascular disease	↓
Fitness	↑	Stroke	↓
Healthy body weight	↑	High blood pressure	↓
Bone health	↑	Type 2 diabetes	↓
Psychological well-being	↑	Colon cancer	↓
Quality of sleep	⇧	Breast cancer	↓
Health-related quality of life	⇧	Depression	↓
Additionally in older adults			
Independence	↑	Falling accidents	↓
Mental acuity	↑		
Key			
Improvement in relation to this health-related aspect	↑	Decrease in risk in relation to this health problem	↓
Strong evidenc ↑ Moderate evidence ⇧			

Fig. 2: Overview of scientifically proven health impact of physical activity in different age groups.

FOSPO, FOPH, Health Promotion Switzerland, bfu, Suva, Health and Physical Activity Network Switzerland. Health-Enhancing Physical Activity. Core document for Switzerland. Magglingen, FOSPO 2013.

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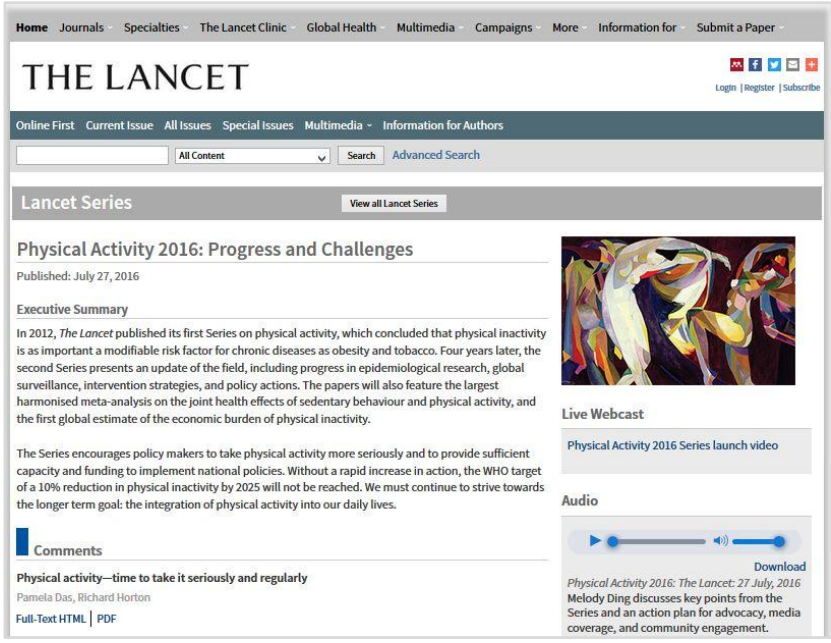
FOSPO, FOPH, Health Promotion Switzerland, bfu, Suva, Health and Physical Activity Network Switzerland. Health-Enhancing Physical Activity. Core document for Switzerland. Magglingen, FOSPO 2013.

- ↑ Fitness
- ↑ Musculoskeletal health
- ↑ Body weight control
- ↓ Risk of non-communicable diseases
- ↑ Mental health
- ↑ Cognitive function
- → ↑ Life expectancy
- ↑ Quality of life
- ↑ Autonomy



www.thelancet.com/series/physical-activity-2016


The economic burden of physical inactivity: a global analysis of major non-communicable diseases

Ding Ding, Kenny D Lawson, Tracy L Kolbe-Alexander, Eric A Finkelstein, Peter T Katzmarzyk, Willem van Mechelen, Michael Pratt, for the Lancet Physical Activity Series 2 Executive Committee*

www.thelancet.com Published online July 27, 2016 http://dx.doi.org/10.1016/S0140-6736(16)30383-X

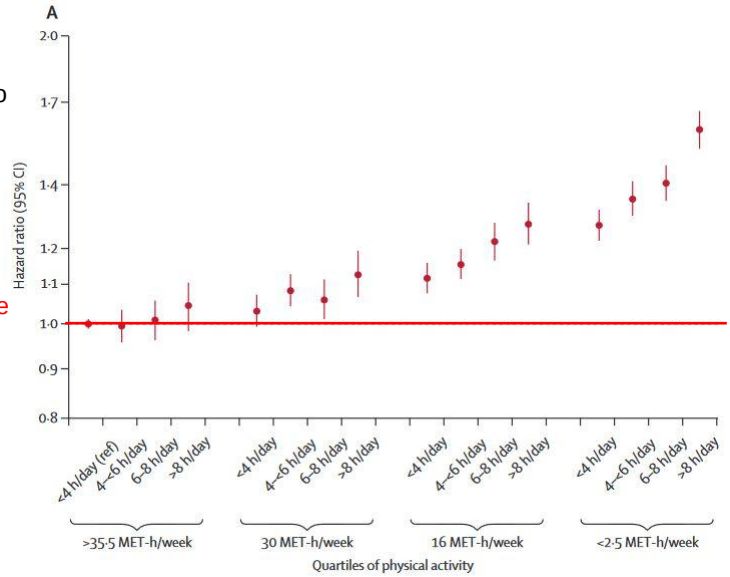
"Based on data from 142 countries, representing 93·2% of the world's population, we conservatively estimated that in 2013 the effect of physical inactivity on five major NCDs and all-cause mortality cost the world economy more than $ 67·5 billion through health-care expenditure and productivity losses. This is equivalent to the total GDP of Costa Rica (ranked around 80th out of all 193 countries with data) in the same year.
(…) Further, sensitivity analysis using less conservative assumptions led to much higher estimates (…)

www.thelancet.com/series/physical-activity-2016

Joint associations of sitting-time and PA with all-cause mortality

Hazard ratio for dying with 95% confidence intervals

Indifference value



Sitting duration per day

Quartiles of PA (MVPA)

Ekelund et al. www.thelancet.com/series/physical-activity-2016

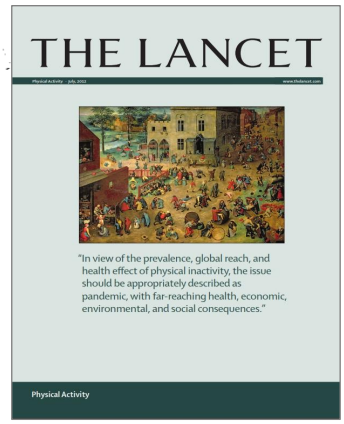
Does physical activity attenuate, or even eliminate, the detrimental association of sitting time with mortality? A harmonised meta-analysis of data from more than 1 million men and women

Ulf Ekelund, Jostein Steene-Johannessen, Wendy J Brown, Morten Wang Fagerland, Neville Owen, Kenneth E Powell, Adrian Bauman, I-Min Lee, for the Lancet Physical Activity Series 2 Executive Committe and the Lancet Sedentary Behaviour Working Group**

www.thelancet.com **Published online July 27, 2016 http://dx.doi.org/10.1016/S0140-6736(16)30370-1**

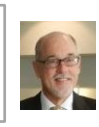
"High levels of moderate intensity physical activity (ie, about 60–75 min per day) seem to eliminate the increased risk of death associated with high sitting time.
However, this high activity level attenuates, but does not eliminate the increased risk associated with high TV-viewing time."

www.thelancet.com/series/physical-activity-2016



Evidence-based intervention in physical activity: lessons from around the world

*Gregory W Heath, Diana C Parra, Olga L Sarmiento, Lars Bo Andersen, Neville Owen, Shifalika Goenka, Felipe Montes, Ross C Brownson, for the Lancet Physical Activity Series Working Group**



Evidence-based physical activity interventions: lessons from around the world – mean effect sizes

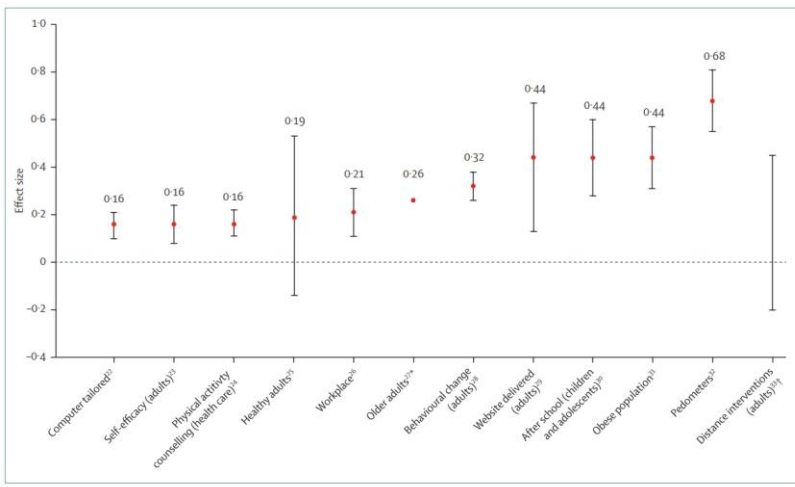
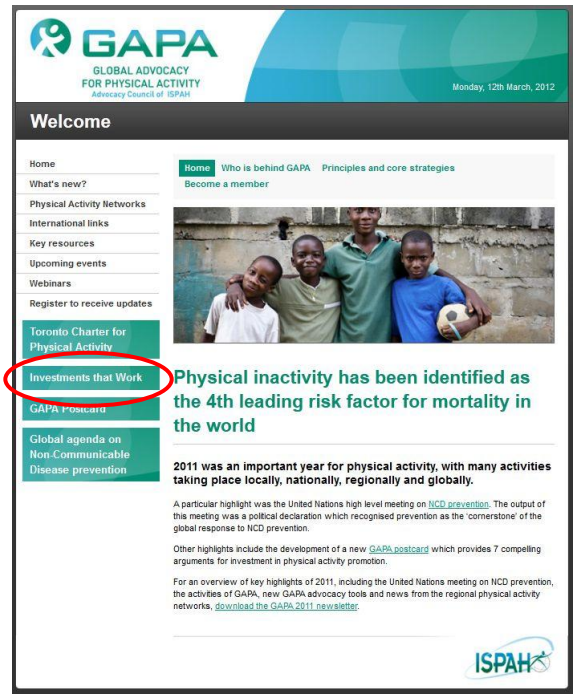


Figure: **Mean effect-size estimates from original systematic reviews**
All are mean effect size and 95% CIs, unless otherwise indicated. *Index. †Range.

Heath GW, Parra-Perez D, Sarmiento OL, et al, for the Lancet Physical Activity Series Working Group. Lancet. 2012 Jul 21;380(9838):272-81.



GAPA, a council of the International Society for Physical Activity and Health ISPAH
www.globalpa.org.uk

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www.globalpa.org.uk

4. Primary health care systems
5. Public education
3. Urban design regulations and infrastructure
6. Integrated community-wide programmes
2. Transport policies and systems
7. „Sport for all“ systems and programmes
1. „Whole-of-school“ programmes

GAPA, a council of the International Society for Physical Activity and Health ISPAH
www.globalpa.org.uk

Review

Effect of school-based interventions on physical activity and fitness in children and adolescents: a review of reviews and systematic update

S Kriemler,[1,2] U Meyer,[1] E Martin,[2] E M F van Sluijs,[3] L B Andersen,[4,5] B W Martin[2]

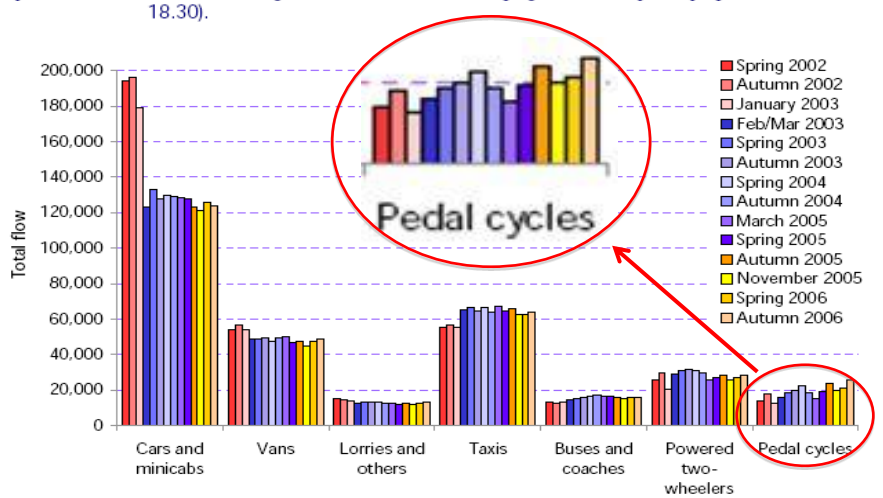
Br J Sports Med 2011;**45**:923–930. doi:10.1136/bjsports-2011-090186

Grigonienė, Jolanta-Janina; Skyrienė, Valentina; Margelienė, N. Analysis of the physical activity of primary school teachers // Pedagogics, psychology, medical-biological problems of physical training and sports [elektroninis išteklius] = Педагогіка, психологія та медико-біологічні проблеми фізичного виховання і спорту. Kharkov: KSADA. ISSN 1818-9172. 2013, no. 9, p. 20–24.

Čepelionienė, Jurgita; Ivaškienė, Vida. The shift of students attitudes towards the teacher of physical education // Ugdymas. Kūno kultūra. Sportas = Education. Physical Training. Sport. Kaunas: Lietuvos sporto universitetas. ISSN 1392-5644. 2014, Nr. 3 (94), p. 10–15.

London Congestion Charge

Figure 2.1 Traffic entering the central London charging zone during charging hours (07.00-18.30).



Comparison of inhabitants' physical activity behaviour in Zermatt (Community 1), Crans-Montana und Verbier

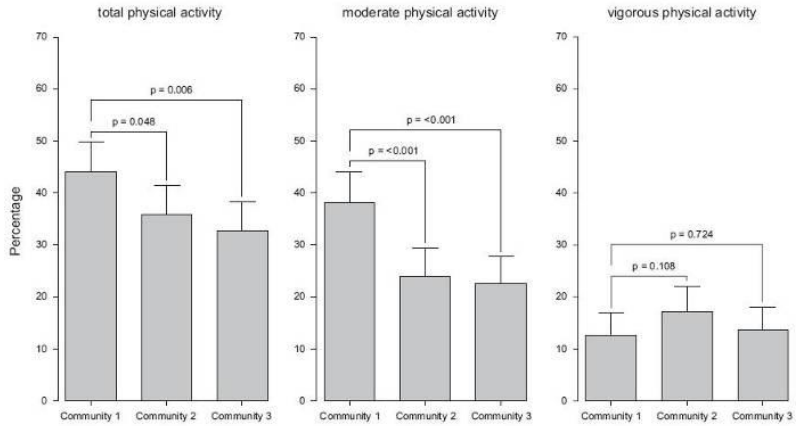


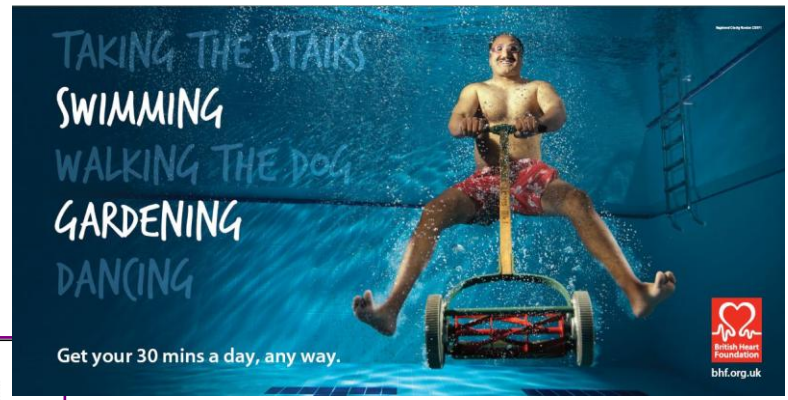
Fig. 1. Age- and sex-adjusted prevalence of sufficient total, moderate and vigorous physical activity by community.

Thommen Dombois O, Braun-Fahrländer Ch, Martin-Diener E. Comparison of adult physical activity levels in three Swiss alpine communities with varying access to motorized transportation. Health & Place, 2007; 13(3): 757-66

Ding, Ding; Adams, Marc A.; Sallis, James F.; Norman, Gregory J.; Hovell, Melbourn F.; Chambers, Christina D.; Hofstetter, Richard C.; Bowles, Heather R.; Hagströmer, Maria; Craig, Cora L.; Gomez, Luis Fernando; De Bourdeaudhuij, Ilse; Macfarlane, Duncan J.; Ainsworth, Barbara E.; Bergman, Patrick; Bull, Fiona C.; Carr, Harriette; Klasson-Heggebo, Lena; Inoue, Shigeru; Murase, Norio; Matsudo, Sandra; Matsudo, Victor; McLean, Grant; Sjöström, Michael; Tomten, Heidi; Lefevre, Johan; Volbekienė, Vida; Bauman, Adrian E. Perceived neighborhood environment and physical activity in 11 countries: Do associations differ by country? // International Journal of Behavioral Nutrition and Physical Activity. London: BioMed Central LTD. ISSN 1479-5868. 2013, vol. 10, Article Number 57, p. 1–11.

Adams, Marc A.; Ding, Ding; Sallis, James F.; Bowles, Heather R.; Ainsworth, Barbara E.; Bergman, Patrick; Bull, Fiona C.; Carr, Harriette; Craig, Cora L.; De Bourdeaudhuij, Ilse; Gomez, Luis Fernando; Hagströmer, Maria; Klasson-Heggebo, Lena; Inoue, Shigeru; Lefevre, Johan; Macfarlane, Duncan J.; Matsudo, Sandra; Matsudo, Victor; McLean, Grant; Murase, Norio; Sjöström, Michael; Tomten, Heidi; Volbekienė, Vida; Bauman, Adrian. Patterns of neighborhood environment attributes related to physical activity across 11 countries: A latent class analysis // International Journal of Behavioral Nutrition and Physical Activity. London: BioMed Central LTD. ISSN 1479-5868. 2013, vol. 10, Article Number 34, p. 1–11.

www.panh.ch/hepaeurope2014



Dr. Luzi Fehrs Krankheits-Tipp Nr. 2:

Vermeiden Sie sorgfältig jede sportliche Betätigung. Gehen Sie nie zu Fuss. Fahren Sie nie Velo. Grundsätzlich verboten ist tiefes Durchatmen - es sei denn, Sie ziehen Rauch ein.

„Dr. Luci Fehr's Illness Tip No 2:

Carefully avoid all forms of sports and physical activity. Never walk. Never use your bicycle. Never ever breathe harder – unless you are inhaling tobacco smoke."

www.agitasp.org.br

27

Time Trends in Physical Activity in the State of São Paulo, Brazil: 2002–2008

VICTOR K. R. MATSUDO[1], SANDRA M. MATSUDO[1], TIMÓTEO L. ARAÚJO[1], DOUGLAS R. ANDRADE[1], LUIS C. OLIVEIRA[1], and PEDRO C. HALLAL[2]

[1]Physical Fitness Research Center, CELAFISCS, São Caetano, BRAZIL; and [2]Federal University of Pelotas, Pelotas, BRAZIL

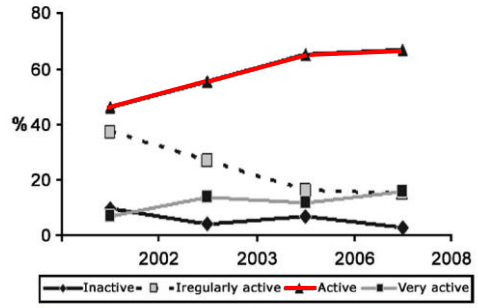


FIGURE 1—Trends of physical activity categories in the state of São Paulo, Brazil (2002, 2003, 2006, and 2008).

Med Sci Sports Exerc. 2010 Dec;42(12):2231-6.

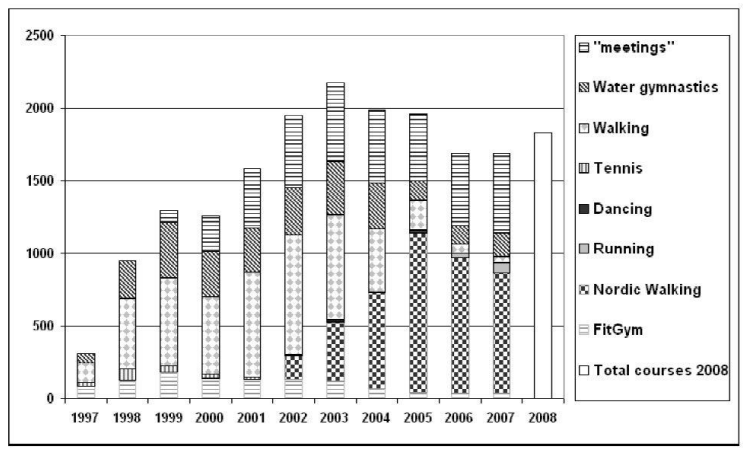
28

The programme Allez Hop

- Weekly lessons during ten week courses, qualified instructors
- National programme
- At the beginning in collaboration with sports clubs and associations; later also with independent instructors

Wanner M, Martin-Diener E, Bauer G, Stamm HP, Martin BW. Allez Hop, a nation-wide programme for the promotion of physical activity in Switzerland: What is the evidence for a population impact after one decade of implementation. Brit J Sport Med 2010.

Course development 1997-2008



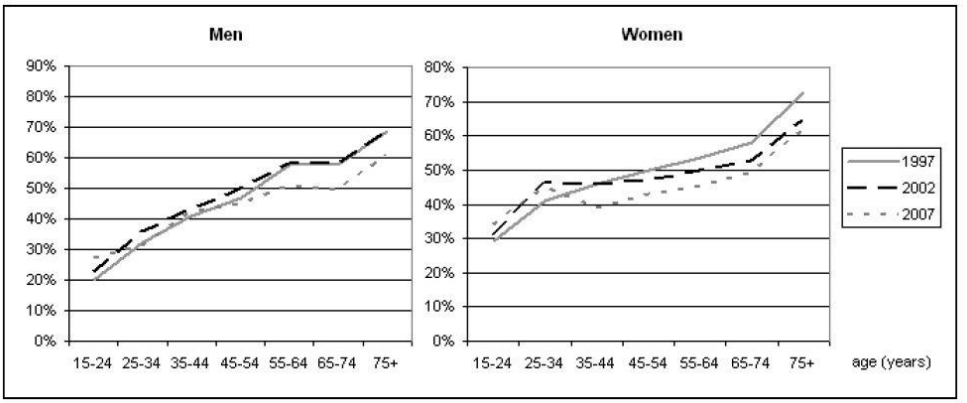
Wanner M, Martin-Diener E, Bauer G, Stamm HP, Martin BW. Allez Hop, a nation-wide programme for the promotion of physical activity in Switzerland: What is the evidence for a population impact after one decade of implementation. Br J Sports Med. 2011 Dec;45(15):1202-7.

ALLEZHOP
Bewegen. Mit Spass.

1997-2008

Population impact of a nation-wide physical activity programme with 200'000 participants

<1 „sweat episodes" during leasure time reported in the Swiss Health Survey (1997: n=12'999; 2002: n=19'698; 2007: n=18'745)



Wanner M, Martin-Diener E, Bauer G, Stamm HP, Martin BW. Brit J Sport Med 2011.

Šukys, Saulius; Majauskienė, Daiva; Česnaitienė, Vida Janina; Karanauskienė, Diana. Do parents' exercise habits predict 13–18-year-old adolescents' involvement in sport? // Journal of Sports Science and Medicine. Bursa: Uludag University. ISSN 1303-2968. 2014, vol. 13, issue 3, p. 522–528.

Scaled up PA interventions in GAPA's 7 investments

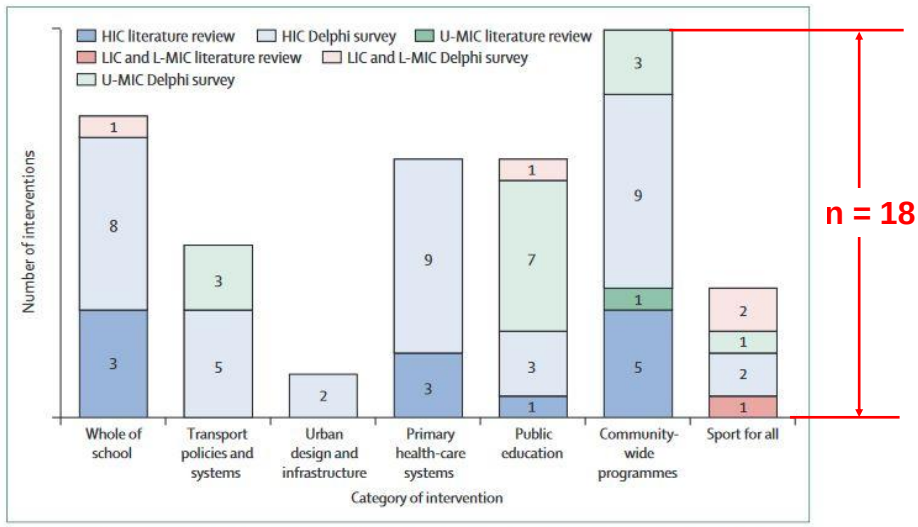
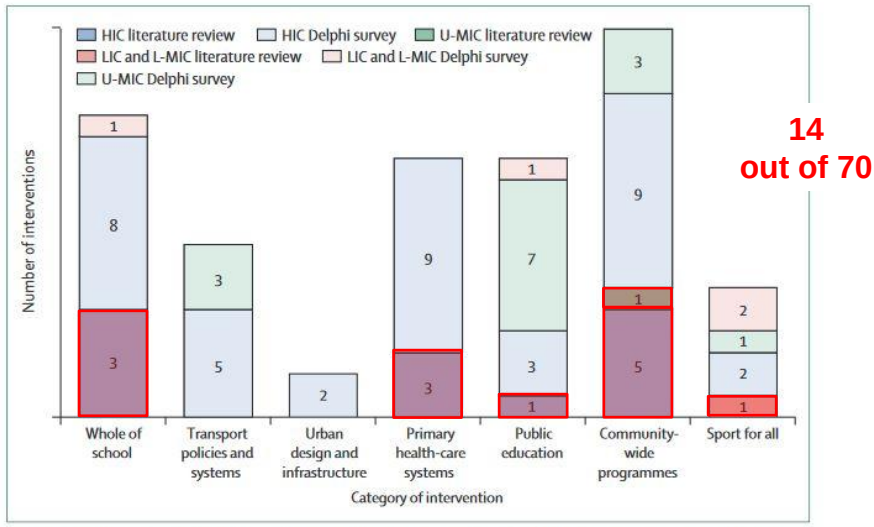


Figure 1: **Number of scaled-up physical activity interventions identified in the literature review and in the Delphi study**
HIC=high-income countries. LIC=low-income countries. L-MIC=lower-middle-income countries. U-MIC=upper-middle-income countries.

Reis et al. www.thelancet.com/series/physical-activity-2016

Scaled up PA interventions identified in the literature review



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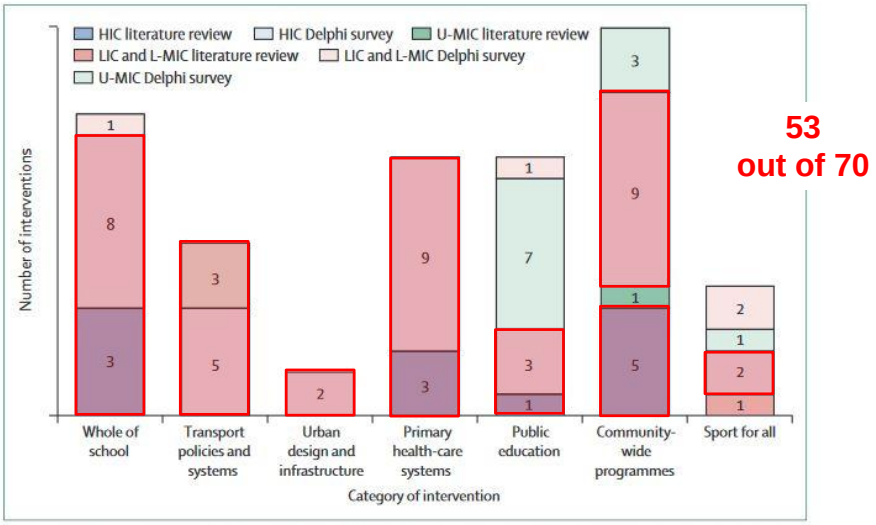
Reis et al. www.thelancet.com/series/physical-activity-2016

Scaled up PA interventions identified from hig-income countries



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Reis et al. www.thelancet.com/series/physical-activity-2016

Physical Activity 2016: Progress and Challenges

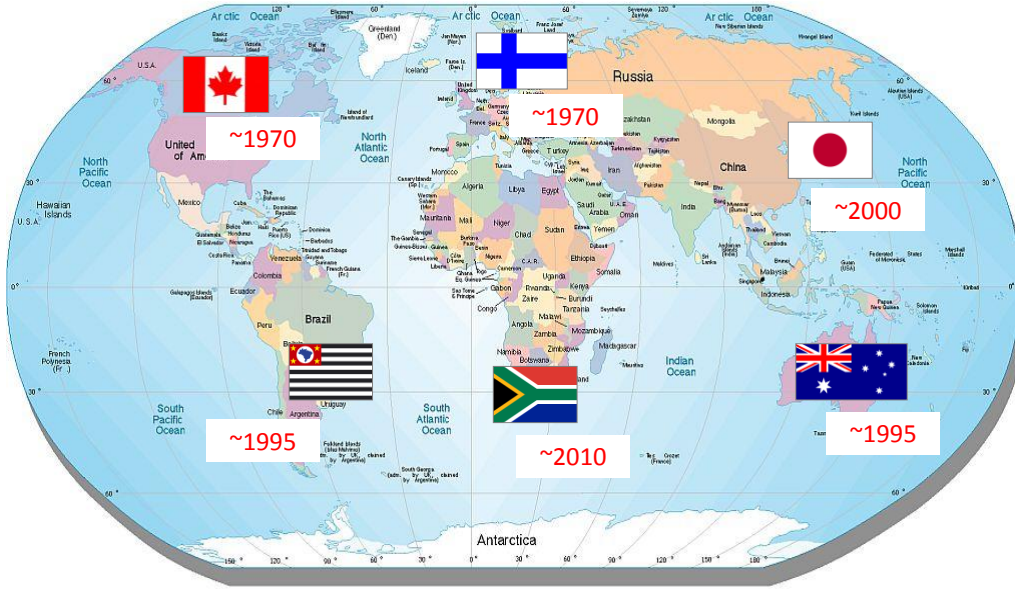
Scaling up physical activity interventions worldwide: stepping up to larger and smarter approaches to get people moving

*Rodrigo S Reis, Deborah Salvo, David Ogilvie, Estelle V Lambert, Shifalika Goenka, Ross C Brownson, for the Lancet Physical Activity Series 2 Executive Committee**

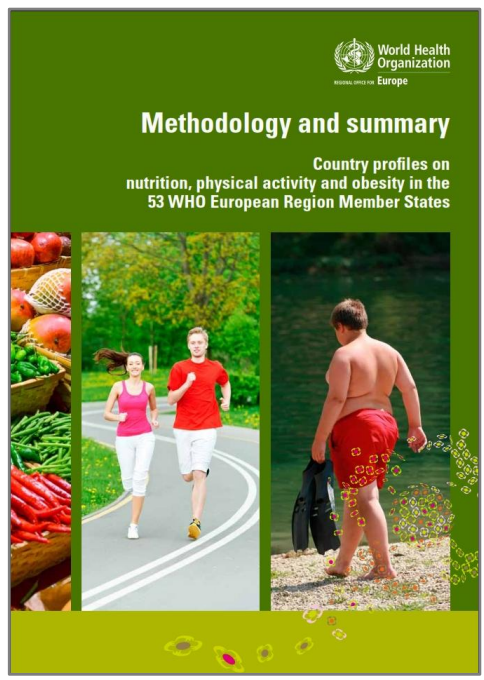
www.thelancet.com **Published online July 27, 2016 http://dx.doi.org/10.1016/S0140-6736(16)30728-0**

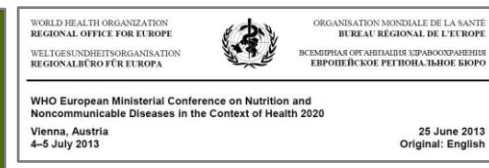
"Drawing on input from researchers and stakeholders across the world, more than 50 unique physical activity interventions were identified that have been scaled up but not reported in the peer-reviewed literature.
Not every intervention implemented at scale is effective in increasing population physical activity levels, and not every effective, researcher-led intervention is scalable (…)"
Large-scale problems require large-scale solutions, and we need the committed and joint efforts of all sectors of government and society to tackle the global public health challenge of inactivity."

Emergence of National **PA Policies in Different World Regions**



Martin BW, Kahlmeier S. Physical activity and health at the population level – the role of international networks. Res Exerc Epidemiol 2014; 16(1): 1-8.




WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR EUROPE
WELTGESUNDHEITSORGANISATION
REGIONALBÜRO FÜR EUROPA
ORGANISATION MONDIALE DE LA SANTÉ
BUREAU RÉGIONAL DE L'EUROPE
ВСЕМІРНАЯ ОРГАНІЗАЦІЯ ЗДРАВООХРАНЕНІЯ
ЕВРОПЕЙСКОЕ РЕГІОНАЛЬНОЕ БЮРО

WHO European Ministerial Conference on Nutrition and Noncommunicable Diseases in the Context of Health 2020
Vienna, Austria
4–5 July 2013
25 June 2013
Original: English

Presented at Vienna Ministerial Conference 2013

www.euro.who.int/en/health-topics/disease-prevention/nutrition/country-work

PA, national policy documents and action plans

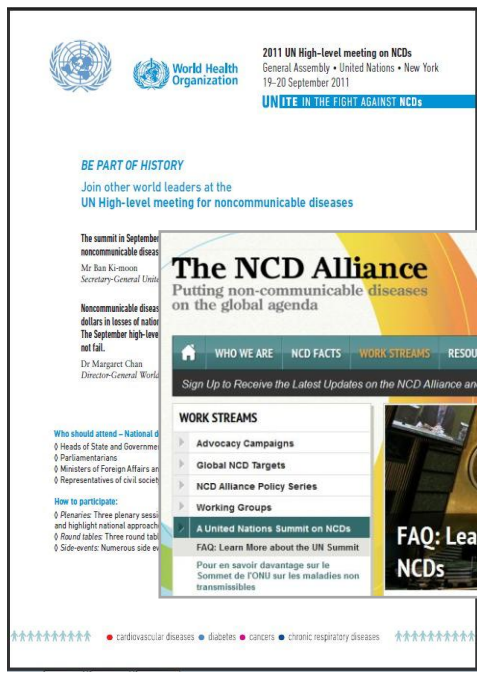
Sport	Target groups	Health	Education		Transportation	
Existence of national "sport for all" policy and/or national "sport for all" implementation programme	Existence of specific scheme or programme for community interventions to promote PA in the elderly	Counselling on PA as part of primary health care activities	Mandatory physical education in primary and secondary schools	Inclusion of PA in general teaching training	National or subnational schemes promoting active travel to school	Existence of an incentive scheme for companies or employees to promote active travel to work
✔			✔[a]	✔[a]		

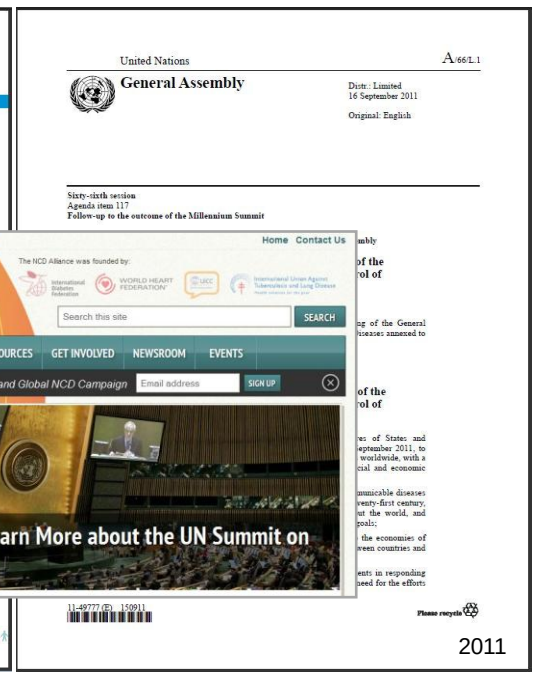
[a] Clearly stated in a policy document, entirely implemented and enforced.
Source: country reporting template on Lithuania from 2009 developed in the context of a WHO/EC project on monitoring progress on improving nutrition and PA and preventing obesity in the European Union (EU).

Leadership, partnerships and professional networks on health-enhancing physical activity (HEPA)

Existence of national coordination mechanism on HEPA promotion	Leading institution	Participating bodies
✔ 2002	Ministry of Health, Ministry of the Interior and Department on Physical Education and Sports	Government departments on health, food, sport, urban planning, education and research, social welfare; nongovernmental organizations, Sport for All Association; academia; civil society; communities; media

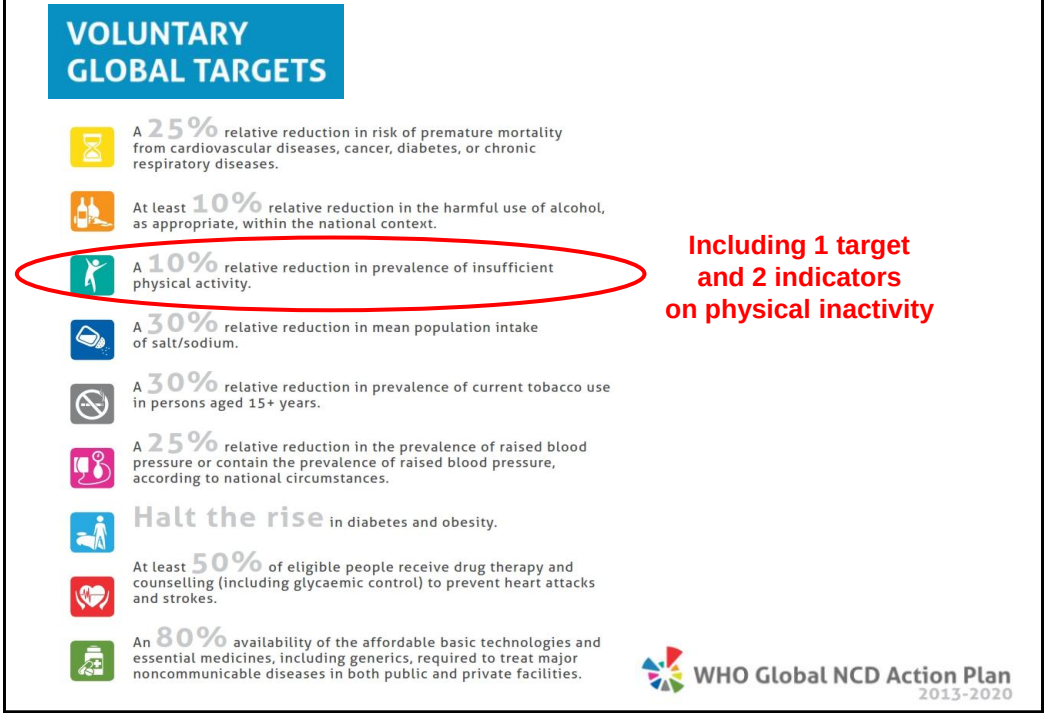
Source: country reporting template on Lithuania from 2009 developed in the context of a WHO/EC project on monitoring progress on improving nutrition and PA and preventing obesity in the EU.



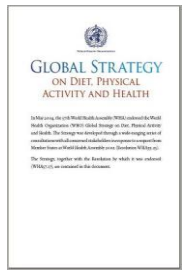


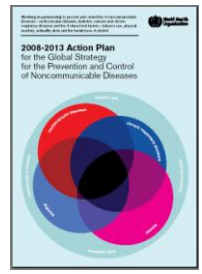
2011

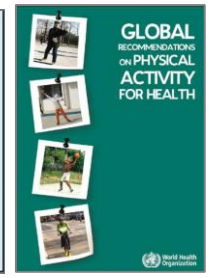
Martin BW, Kahlmeier S. Physical activity and health at the population level – the role of international networks. Res Exerc Epidemiol 2014; 16(1): 1-8.

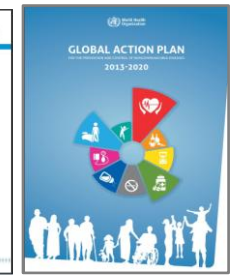


HEPA promotion in international public health









2004 2008 2010 2011 2013

Martin BW, Kahlmeier S. Physical activity and health at the population level – the role of international networks. Res Exerc Epidemiol 2014; 16(1): 1-8.

HEPA promotion in European public health

WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR EUROPE

WELTGESUNDHEITSORGANISATION
REGIONALBÜRO FÜR EUROPA

ORGANISATION MONDIALE DE LA SANTÉ
BUREAU RÉGIONAL DE L'EUROPE

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5 July 2013

Vienna Declaration on Nutrition and Noncommunicable Diseases in the Context of Health 2020

"9. We urge the WHO Regional Committee for Europe to mandate the development of a physical activity strategy, alongside the new food and nutrition action plan."

Martin BW, Kahlmeier S. Physical activity and health at the population level – the role of international networks. Res Exerc Epidemiol 2014; 16(1): 1-8.


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SPORT
Supporting fair play and cooperation in sport
European Commission > Sport > News > 2013
News
view all news
EU Council adopts the first ever Recommendation in sport (HEPA) and conclusions on the contribution of sport to the EU economy. It also debates "Good governance in sport"
Start date : 29/11/2013 16:02:15
www.ec.europa.eu/sport


Legal notice | Cookies | Contact | Search English (en)
SPORT
Supporting fair play and cooperation in sport
European Commission > Sport > News > 2013
News
view all news
"On 26 November [2013] the [EU] Council adopted the first ever Council Recommendation in sport, notably on promoting health-enhancing physical activity (HEPA) . […] There was a shared understanding that more can be done together to address the high rates of physical inactivity in the EU and the economic and social costs related to it."

WORLD HEALTH ORGANIZATION
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WHO European Region Informal Meeting on a Road Map for a Strategy on Health Enhancing Physical Activity

Erlangen, Germany
25-26 March 2014

03 March2014
Original: English

Starting point for the development of a European Physical Activity Strategy

WORLD HEALTH ORGANIZATION
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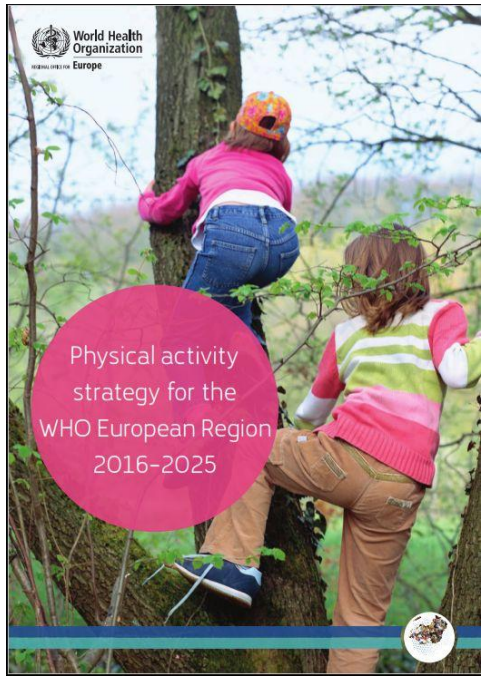
2014

World Health Organization
REGIONAL OFFICE FOR Europe

REGIONAL COMMITTEE FOR EUROPE
65TH SESSION
Vilnius, Lithuania, 14–17 September 2015

Physical activity strategy for the WHO European Region 2016–2025

2015

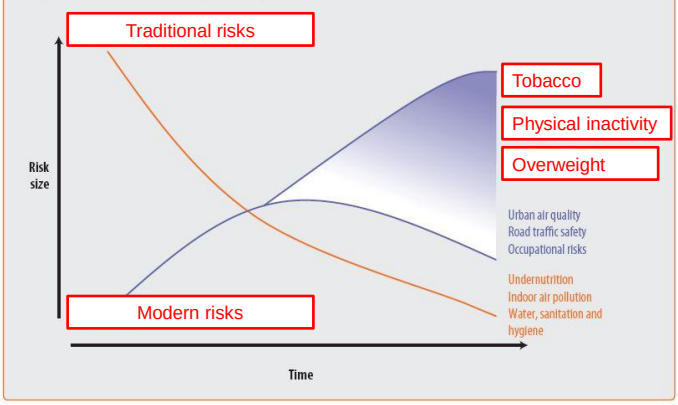


Priority areas

- **Priority area 1** – Providing leadership and coordination for the promotion of physical activity
- **Priority area 2** – Supporting the development of children and adolescents
- **Priority area 3** – Promoting physical activity for all adults as part of daily life, including during transport, leisure time, at the workplace and through the health-care system
- **Priority area 4** – Promoting physical activity among older people
- **Priority area 5** – Supporting action through monitoring, surveillance, the provision of tools, enabling platforms, evaluation and research

The Risk Transition

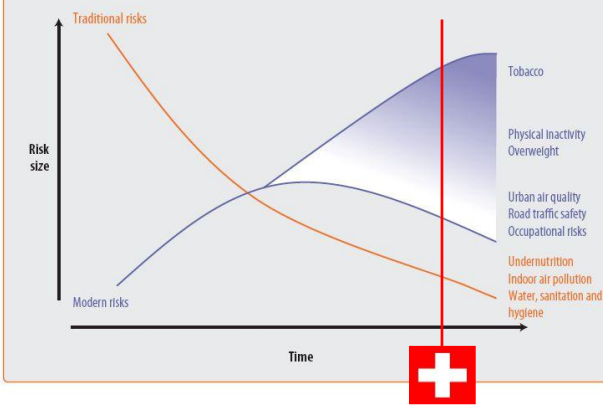
Figure 2: The risk transition. Over time, major risks to health shift from traditional risks (e.g. inadequate nutrition or unsafe water and sanitation) to modern risks (e.g. overweight and obesity). Modern risks may take different trajectories in different countries, depending on the risk and the context.



Global Health Risks
WHO 2009

The Risk Transition

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.

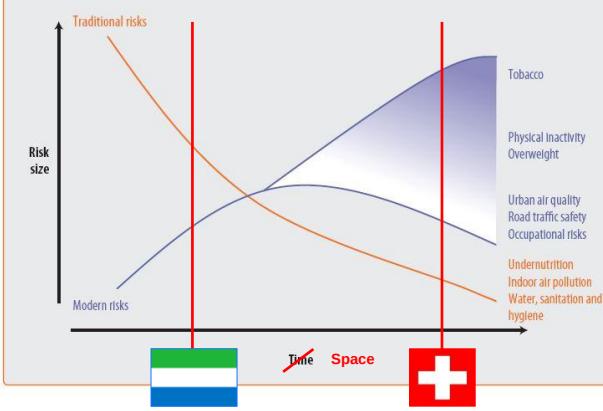


Switzerland

Global Health Risks
WHO 2009

The Risk Transition

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.

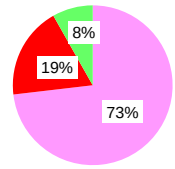
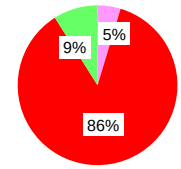


Sierra Leone

Switzerland

Global Health Risks
WHO 2009

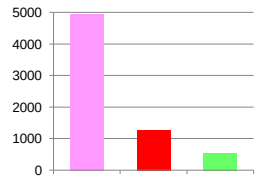
The Risk Transition

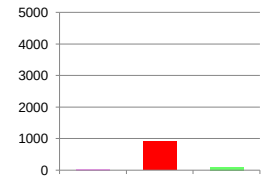
	Sierra Leone	Switzerland
Population	6.0 million	8.0 million
Years of Life Lost by causes		
Life expectancy	46 years	83 years
Healthy life expectancy	39 years	73 years

Communicable diseases

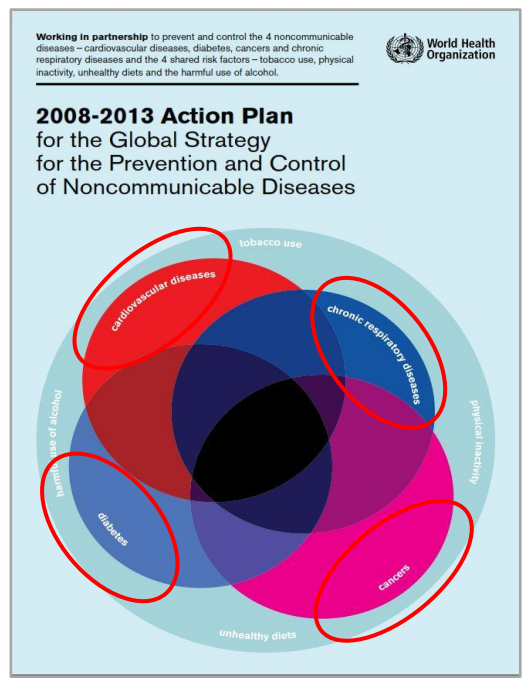
Non-communicable diseases

Injuries





Global Health Observatory WHO
www.who.int/gho
2012 data



4 main groups of non-communicable diseases

Cardio-vascular diseases

Chronic respiratory disease

Diabetes

Cancers

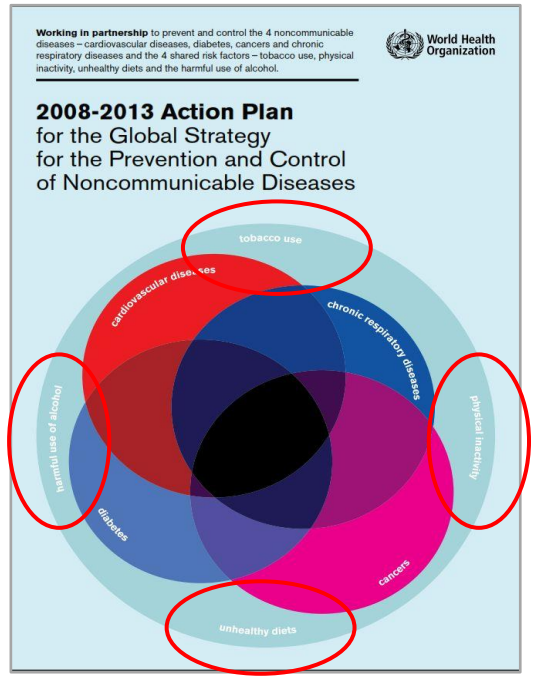
4 main risk factors

Tobacco use

Cardio-vascular diseases

Harmful use of alcohol

Diabetes



Chronic respiratory disease

Physical inactivity

Cancers

Unhealthy diets

Research aims

- Quantifying combined effects of the four behavioural risk factors for NCD on mortality
- Developing respective risk charts for communication

Methods

- Record linkage study: MONICA Study & Swiss National Research Programme 1A with Swiss National Cohort
- 16'721 Participants (16-90 years)
- Up to 32 years of mortality follow-up

Analyses

- (Mortality risks: Cox proportional Hazard Models)
- 10-year survival probabilities: Weibull Regression Models

Martin-Diener E, Meyer J, Braun J, Tarnutzer S, Fäh D, Rohrmann S, Martin BW, Swiss National Cohort (SNC). The combined effect on survival of four main behavioural risk factors for non-communicable diseases. Prev Med 2014; 65:148-52.
Project funded by Swiss Heart Foundation and Swiss Cancer League and supported by Swiss National Science Foundation.

10 year survival probabilities at 65 and 75 years of age in the Swiss National Cohort – risk charts

Women

age 75	alcohol consumption: no		moderate		high	
smokers, fruit no	58	55	58	55	50	47
smokers, fruit yes	62	59	61	59	54	51
non smokers, fruit no	72	70	72	69	66	63
non smokers, fruit yes	74	72	74	72	69	66
LTPA	high	low	high	low	high	low

age 65	alcohol consumption: no		moderate		high	
smokers, fruit no	83	81	82	81	79	77
smokers, fruit yes	84	83	84	83	81	79
non smokers, fruit no	89	88	89	88	86	85
non smokers, fruit yes	90	89	90	89	88	87
LTPA	high	low	high	low	high	low

Men

age 75	alcohol consumption: no		moderate		high	
smokers, fruit no	46	40	45	39	42	35
smokers, fruit yes	52	45	51	45	47	41
non smokers, fruit no	62	57	62	56	59	53
non smokers, fruit yes	67	62	67	61	64	58
LTPA	high	low	high	low	high	low

age 65	alcohol consumption: no		moderate		high	
smokers, fruit no	74	70	74	69	71	67
smokers, fruit yes	77	74	77	73	75	71
non smokers, fruit no	83	80	83	80	81	78
non smokers, fruit yes	86	83	85	83	84	81
LTPA	high	low	high	low	high	low

Models controlled for survey, education, marital status and nationality.

Men: N=8132 (of which 1967 cases) Women: N=8589 (of which 1566 cases). LTPA: leisure time physical activity

Martin-Diener E, Meyer J, Braun J, Tarnutzer S, Fäh D, Rohrmann S, Martin BW, Swiss National Cohort (SNC). The combined effect on survival of four main behavioural risk factors for non-communicable diseases. Prev Med 2014; 65:148-52.
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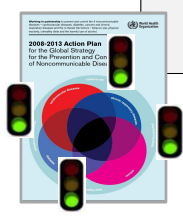
10 year survival probabilities in women at 65 years of age in the Swiss National Cohort – risk chart

77%

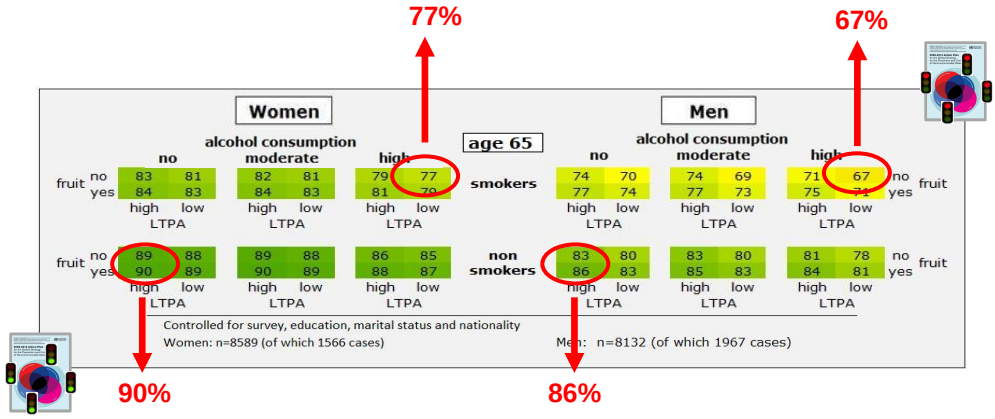
	alcohol consumption: no		moderate		high	
smokers, fruit no	83	81	82	81	79	77
smokers, fruit yes	84	83	84	83	81	79
non smokers, fruit no	89	88	89	88	86	85
non smokers, fruit yes	90	89	90	89	88	87
LTPA	high	low	high	low	high	low



90%

Martin-Diener E, Meyer J, Braun J, Tarnutzer S, Fäh D, Rohrmann S, Martin BW, Swiss National Cohort (SNC). The combined effect on survival of four main behavioural risk factors for non-communicable diseases. Prev Med 2014; 65:148-52.

10 year survival probabilities at 65 years of age in the Swiss National Cohort – risk chart



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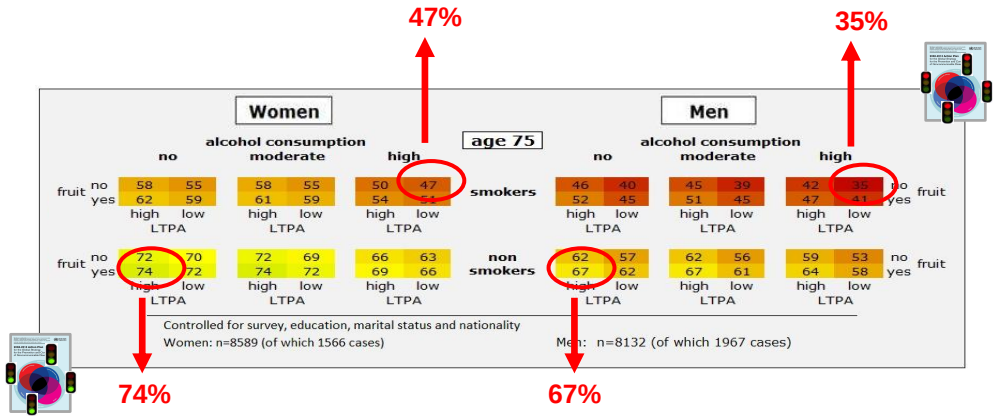
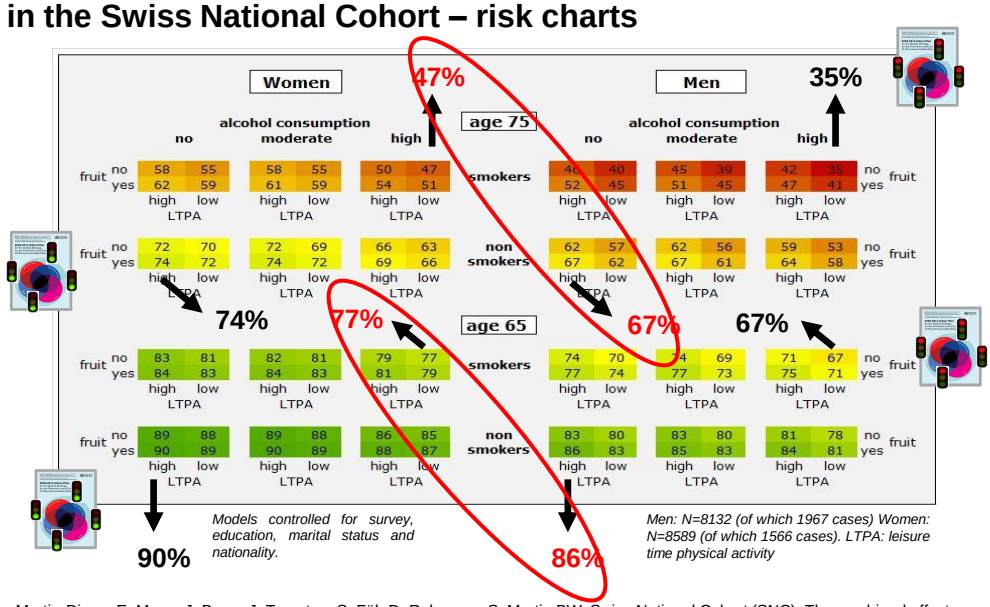
10 year survival probabilities at 75 years of age in the Swiss National Cohort – risk chart



Martin-Diener E, Meyer J, Braun J, Tarnutzer S, Fäh D, Rohrmann S, Martin BW, Swiss National Cohort (SNC). The combined effect on survival of four main behavioural risk factors for non-communicable diseases. Prev Med 2014; 65:148-52.
Project funded by Swiss Heart Foundation and Swiss Cancer League and supported by Swiss National Science Foundation.

10 year survival probabilities at 65 and 75 years of age in the Swiss National Cohort – risk charts



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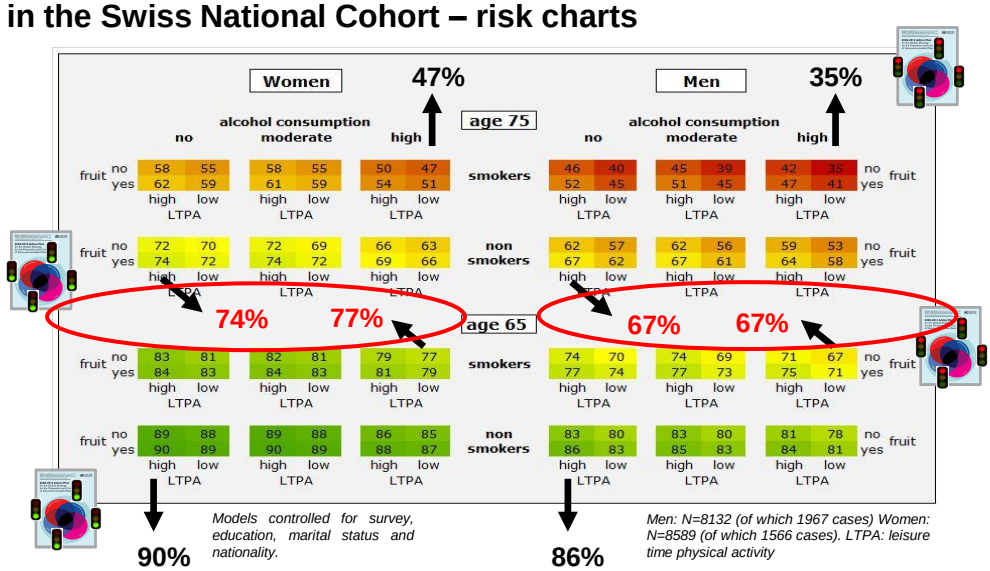
10 year survival probabilities at 65 and 75 years of age in the Swiss National Cohort – risk charts



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Conclusions

- The independent and combined impact of WHO's four behavioural risk factors for NCD could clearly be shown in a Swiss population sample, i.e. in a population with a well developed health care system
- The combined impact of healthy behaviour on mortality is stronger than the differences between men and women
- Healthy behaviour keeps you young for ten years longer!

at 75 years

≈

at 65 years

Martin-Diener E, Meyer J, Braun J, Tarnutzer S, Fäh D, Rohrmann S, Martin BW, Swiss National Cohort (SNC). The combined effect on survival of four main behavioural risk factors for non-communicable diseases. Prev Med 2014; 65:148-52.
Project funded by Swiss Heart Foundation and Swiss Cancer League and supported by Swiss National Science Foundation.

PA Promotion in the Context of Overall Health Policy

- There is excellent evidence for the health effects of physical activity and for the impact of inactivity at the populaton level
- There is evidence for effective interventions, but need for more large scale approaches at the population level
- Physical activity has become a part of official health policy
- Integration in existing structures and establishment of funding mechanisms now are the challenges, following the rules and criteria of the sectors involved