The importance of physical activity for health and for society

Professor Nanette Mutrie MBE

Director - Physical Activity for Health Research Centre (PAHRC), Institute for Sport, Physical Education and Health Sciences, University of Edinburgh
The Toronto Charter for Physical Activity: A Global Call for Action

Launched Toronto April 2010
International Congress Physical Activity for Health
Led by Professor Fiona Bull
Chair, Global Advocacy for Physical Activity, ISPAH
July 2012

• Physical inactivity has reached ‘Pandemic’ proportions
• Interventions are needed!

“In view of the prevalence, global reach, and health effect of physical inactivity, the issue should be appropriately described as pandemic, with far-reaching health, economic, environmental, and social consequences.”
7 Investments that work for physical activity

1. ‘Whole-of-school’ programs

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

3. Urban design regulations and infrastructure that provides for equitable and safe access for recreational physical activity, and recreational and transport-related walking and cycling across the life course

4. Physical activity and NCD prevention integrated into primary health care systems

5. Public education, including mass media to raise awareness and change social norms on physical activity

6. Community-wide programs involving multiple settings and sectors & that mobilize and integrate community engagement and resources

7. Sports systems and programs that promote ‘sport for all’ and encourage participation across the life span
Strong evidence of reduced rates of the following for adults

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

Lee et al., Lancet, July 2012
Comparison with smoking - using global figures

Lee et al., Lancet, July 2012
WHO action plan for the prevention and control of non-communicable diseases 2013–2020

- Endorsed by United Nations High level meeting in 2011
- Set of voluntary global targets to be achieved by 2025

- Physical inactivity one of 9 goals
- “10% relative reduction in prevalence of insufficient physical activity”
Global targets for NCDs

- Physical inactivity: 10% reduction
- Salt/sodium intake: 30% reduction
- Tobacco use: 30% reduction
- Raised blood pressure: 25% reduction
- Premature mortality from NCDs: 25% reduction
- Essential NCD medicines and technologies: 80% coverage
- Drug therapy and counseling: 50% coverage
- Diabetes/obesity: 0% increase

2025
THE BANGKOK DECLARATION ON PHYSICAL ACTIVITY FOR GLOBAL HEALTH AND SUSTAINABLE DEVELOPMENT

THE 6th ISPAH INTERNATIONAL CONGRESS ON PHYSICAL ACTIVITY AND PUBLIC HEALTH
Bangkok, Thailand
16-19 November 2016
Action on Physical Activity can contribute to achieving 8SDG
Actions from Bangkok declaration

• The Bangkok Declaration ......calls upon governments, policy makers, donors and stakeholders including the World Health Organization, the United Nations and all relevant non-governmental organisations to:

• Renew commitments to invest in and implement at scale and pace policy actions to decrease physical inactivity across the life course as a contribution to reducing the global burden of NCDs and achieving 2030 Agenda goals:
  • multi-sector leadership
  • partnerships and sustained commitment
  • targeted allocation of resources
  • investment from health ministries, and other government departments
  • evidence based approach
  • implemented at national and local level.
WHO global strategy consultation


ISPAH / ISBNPA WEBINAR
DRAFT ONE GLOBAL ACTION PLAN ON PHYSICAL ACTIVITY
DR FIONA BULL, PROGRAMME MANAGER, SPP/PND/NMH

SEPT 5 2017
COMMENCING: 4PM GENEVA TIME
DURATION: 60 MINS
Scottish Government's Physical Activity Strategy 2003

"Scotland's physical activity strategy is an excellent example of how policymakers can adopt an integrated and multi-sectoral approach to improve public health and reduce chronic disease"

Dr Pekka Puska, Director, Noncommunicable Disease Prevention and Health Promotion, World Health Organization
**Vision: A More Active Scotland**

Physical activity is about getting people moving. Daily walking, playing in a park, going to a gym, training with a team or aspiring to win a gold medal - it really doesn’t matter how people get active, it just matters that we do.  
Being physically active contributes to our personal, community and national wellbeing.  
Our vision is of a Scotland where more people are more active, more often.

### National Outcomes

<table>
<thead>
<tr>
<th>Business</th>
<th>Employment</th>
<th>Research and Innovation</th>
<th>Young People</th>
<th>Early Years</th>
<th>Healthier</th>
<th>Inequalities Tackled</th>
<th>Life Chances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe from Crime</td>
<td>Sustainable Places</td>
<td>Resilient Communities</td>
<td>Environment Valued</td>
<td>National Identity</td>
<td>Impact on Environment</td>
<td>Older People Supported</td>
<td>Public Services</td>
</tr>
</tbody>
</table>

### Active Scotland Outcomes

<table>
<thead>
<tr>
<th>We encourage and enable the inactive to be more active</th>
<th>We encourage and enable the active to stay active throughout life</th>
<th>We develop physical confidence and competence from the earliest age</th>
</tr>
</thead>
<tbody>
<tr>
<td>We improve our active infrastructure – people and places</td>
<td>We support wellbeing and resilience in communities through physical activity and sport</td>
<td>We improve opportunities to participate, progress and achieve in sport</td>
</tr>
</tbody>
</table>

**Equality: Our commitment to equality underpins everything we do**

http://www.gov.scot/Topics/ArtsCultureSport/Sport/Outcomes-Framework
Walking and cycling strategies

Let's Get Scotland Walking
The National Walking Strategy

Action Plan Overview
2016 – 2026

Walking strategy:
http://www.scotland.gov.uk/Publications/2014/06/5743

http://www.paha.org.uk/File/Index/4233ea1e-7d2e-443f-a454-a5d900f86375

Long term vision for active travel in Scotland in 2030:
http://www.transportscotland.gov.uk/sites/default/files/554346_334708_Active_Travel_210mm_p9_HR_20141126103050.pdf
Infographic on the Chief Medical Officers' guidelines

The proportion of adults in Scotland achieving the minimum MVPA recommendations from 2008 to 2016

Inactivity is as risky and more prevalent than smoking. We have achieved reductions in smoking with a variety of fiscal and individual interventions.
2016 Scottish Household Survey (SHS)

Figure 8.2: Participation in physical activity and sport in the last four weeks
Percentages, 2007 to 2016 data (minimum base: 9,130)

How do we get our 150 minutes of moderate or 75 minutes of vigorous?
Age- and sex-related differences in the contributions of the domains of PA to total MVPA amongst adults in Scotland who met the aerobic PA guidelines in 2013

Source: Strain et al. 2015, Prev Med Reports
Age- and sex-related differences in the contributions of the domains of PA to total MVPA amongst adults in Scotland who met the aerobic PA guidelines in 2013

Source: Strain et al. 2015, Prev Med Reports
Next two speakers [and then questions]

• Dr Charlie Foster, University of Bristol
  • The economic cost of inactivity
• Dr Paul Kelly, University of Edinburgh
  • The economic benefit of increasing physical activity
Cost estimates for physical inactivity in Scotland

Dr Charlie Foster
Centre for Exercise, Nutrition and Health Sciences
School for Policy Studies

Dr Nick Townsend
Nuffield Department of Population Health
University of Oxford
What costs Scotland more?

Highest

(http://www.heraldscotland.com/news/15103472.Traffic_congestion_in_Scotland_cost_drivers___2.4bn_last_year/#comments-anchor)

3rd

(http://www.gov.scot/Topics/Health/Services/Alcohol)

Lowest

(http://www.gov.scot/Topics/Health/Services/Smoking)

2nd

(£ per Scot)
Aims

• To outline the method, results and implications of a new estimate of the cost of physical inactivity for Scotland
"I think you should be more explicit here in step two."
Methods for developing cost estimates for physical inactivity

- Identify diseases related to physical inactivity (PiA)
- Identify total costs of diseases related to physical activity to the NHS Scotland
- Identify the relative contribution of PiA to each disease – the *Population Attributable Fraction (PAF)*
- Apply the PAF to the cost per disease
- Calculate overall costs
• Total cost of physical inactivity to Scotland 2012

£91.4M

£18.00 per person
Total cost of physical inactivity to Scotland 2015

- Total cost of physical inactivity to Scotland 2015
  £77M

- £14.60 per person
Mortality rates from Scotland's big 3 killers, cancer, coronary heart disease and stroke are declining.
What costs could also be added?

• Other disease areas direct health service costs
  • Dementia & Alzheimer’s Disease *+74% increase*
  • Mental health
  • Obesity
  • Falls

• Indirect costs
  • Lost productivity
  • Premature mortality

• Others?
Let’s make comparisons easy to understand

space required to transport 60 people

car  bus  bicycle

(Poster in city of Muenster Planning Office, August 2001) Credit: PressOffice City of Munster, Germany
Cost of physical inactivity (£/population) related disease by SHA

Cost of doing Nothing
£14 ~ €16.6

Foster et al, 2009
Cost of physical inactivity (£/population) related disease by SHA

Spend in London is 85p per head ~ €1

Foster et al, 2009
Scotland's Spending Plans and Draft Budget 2017-18

Table 4.05: More Detailed Spending Plans (Level 3)

<table>
<thead>
<tr>
<th>Level 3</th>
<th>2016-17 Draft Budget £m</th>
<th>2016-17 Budget £m</th>
<th>2017-18 Draft Budget £m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport and Legacy</td>
<td>42.5</td>
<td>42.3</td>
<td>39.1</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>3.3</td>
<td>3.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>45.8</td>
<td>45.6</td>
<td>42.4</td>
</tr>
<tr>
<td>DEL Resource</td>
<td>45.8</td>
<td>36.1</td>
<td>42.4*</td>
</tr>
<tr>
<td>DEL Capital</td>
<td>-</td>
<td>9.5</td>
<td>-</td>
</tr>
</tbody>
</table>
The Cost of Physical Inactivity to Scotland
Based on research commissioned by the British Heart Foundation
These figures do not include the costs of conditions including dementia and mental health issues

Physical Inactivity costs the NHS in Scotland

~£77 million p/a
equating to a cost of £14.60 per person!

Spend on sport and physical activity is £7.89 per person
Spend on sport and physical activity is £7.89 per person

Active Transport Spend…..

£14.80 per person

£22.69
Blueprint for using economic tools for physical activity implementation

PHASE ONE
To identify the economic burden of physical inactivity and appropriate interventions or policies

1. What are appropriate policies and interventions?
2. What are their economic costs and benefits?
3. What are additional costs and benefits of interventions and policies across sectors?

PHASE TWO
To identify the economic costs and benefits for an intervention or policy might need adaption/piloting

1. What resources are needed to scale up and how do you mobilise these?
2. What are the cross-sectoral economic benefits and costs?
3. What are the economic impacts at a population level?

PHASE THREE
To identify the economic costs and benefits of full implementation of intervention or policy

1. What is the reach and adoption of the policy or intervention?
2. How effective is it?
3. What are the economic costs and benefits?

PHASE FOUR
To identify the economic costs and benefits of full implementation of intervention or policy at scale

1. What are the benefits of pilot intervention studies?
2. What are the benefits and their value across sectors?

Adapted from D'Esposito F, Thomas E and Oldenburg B. A practical guide for implementation research to improve the prevention and control of NCDs. WHO, 2016
Blueprint for Valuing Physical Activity

Phase 2  What are the economic benefits /costs of adaptations and piloting of interventions or policies?

Aim  To identify the economic costs and benefits for an intervention or policy which might need adaption/piloting

Actions  What are the health benefits of pilot intervention studies? What are the benefits and their value across other sectors?

Tools  For Sport MOVES TOOL
For Active Transport WHO HEAT Tool
Workplace NICE Business Case Tool

Cluster Randomised Controlled Trial

- 539 year five and six pupils, from 20 primary schools (max of 30 pupils per school)

Schools allocated to intervention or control arm after baseline data had been collected

Primary outcome was accelerometer assessed MVPA assessed during last 3 weeks of intervention (T1) and 6-months later (T2)

Jago et al, Trials 2013
• The indicative average cost of this intervention was £49 per child - £1.25

• The programme was highly valued by school staff, children and parent

• Training school staff to deliver physical activity programmes is a potentially cost-effective public health intervention

• Work is needed to refine content
Implications

• Any estimate has limitations
• The incidence and costs of 5 main diseases are changing and are an **UNDERESTIMATE**
• New methods include costs of other PI diseases
• Use economic tools
  • EPHEPA Blueprint
• Promoting physical activity and sport is the optimal prevention spend
What costs Scotland more?

Highest

Lowest

3rd

2nd

(£ per Scot)

http://www.gov.scot/Topics/Health/Services/Alcohol
http://www.gov.scot/Topics/Health/Services/Smoking
What costs Scotland more?

£900

£55.43

£14.60

£444

(£ per Scot)

http://www.gov.scot/Topics/Health/Services/Alcohol
http://www.gov.scot/Topics/Health/Services/Smoking
Does physical activity moderate the association between alcohol drinking and all-cause, cancer and cardiovascular diseases mortality? A pooled analysis of eight British population cohorts

K Perreault,1,2 A Bauman,2,3 N Johnson,2,4 A Britton,5 V Rangul,3 E Stamatakis2,4,5

Abstract
Objective To examine whether physical activity (PA) reduce alcohol consumption have involved alcohol risk reducing campaigns and measures aimed at

(£ per Scot)

http://www.gov.scot/Topics/Health/Services/Alcohol
http://www.gov.scot/Topics/Health/Services/Smoking
Leisure-time physical activity and lung cancer risk: A systematic review and meta-analysis

Darren R. Brenner a,b,c,* , Demetra H. Yannitsos a,b , Megan S. Farris a,b , Mattias Johansson d , Christine M. Friedenreich a,b,c

a Department of Cancer Epidemiology and Prevention Research, Cancer Control Alberta, Alberta Health Services, Canada
b Department of Community Health Sciences, Cumming School of Medicine, University of Calgary, Canada
c Department of Oncology, Cumming School of Medicine, University of Calgary, Canada
d Genetic Epidemiology Group, International Agency for Research on Cancer, Lyon, France

ARTICLE INFO

Article history:
Received 5 November 2015
Received in revised form 21 January 2016
Accepted 29 January 2016

ABSTRACT

Objectives: We conducted a systematic review and meta-analysis of the association between recreational physical activity and lung cancer risk to update previous analyses and to examine population subgroups of interest defined by smoking status and histology.

Materials and methods: We searched the PubMed database for studies up to May 2015. Individual study
Urban design, transport, and health 2

Land use, transport, and population health: estimating the health benefits of compact cities

Mark Stevenson, Jason Thompson, Thiago Hêrick de Sá, Reid Ewing, Dinesh Mohan, Rod McClure, Ian Roberts, Geetam Tiwari, Billie Giles-Corti, Xiaoduan Sun, Mark Wallace, James Woodcock

Using a health impact assessment framework, we estimated the population health effects arising from alternative land-use and transport policy initiatives in six cities. Land-use changes were modelled to reflect a compact city in which land-use density and diversity were increased and distances to public transport were reduced to produce low motorised mobility, namely a modal shift from private motor vehicles to walking, cycling, and public transport. The modelled compact city scenario resulted in health gains for all cities (for diabetes, cardiovascular disease, and respiratory disease) with overall health gains of 420–826 disability-adjusted life-years (DALYs) per 100,000 population. However, for moderate to highly motorised cities, such as Melbourne, London, and Boston, the compact city scenario predicted a small increase in road trauma for cyclists and pedestrians (health loss of between 34 and 41 DALYs per
The Cost of Physical Inactivity to Scotland
Based on research commissioned by the British Heart Foundation
These figures do not include the costs of conditions including dementia and mental health issues

Physical Inactivity costs the NHS in Scotland

~£77 million p/a equating to a cost of £14.60 per person!

The Cost of the Big 5 per year due to physical inactivity
- Coronary Heart Disease: £25 million
- Diabetes: £15 million
- Cerebrovascular Disease: £15 million
- Gastro Intestinal Cancer: £12 million
- Breast Cancer: £9.5 million

Sector Expenditure per year due to physical inactivity
- Acute Services: £44 million
- Pharmaceutical Services: £11 million
- General Medical Services: £7.5 million
- Geriatric Long Stay: £5 million
- A&E and Outpatients: £3 million

Coronary Heart Disease costs equate to 32% of all the costs incurred due to physical inactivity.

The cost per person in Scotland for physical inactivity is more than £1 higher than England.

Acute & Pharmaceutical Services combined accounted for 90% of the total costs to the NHS.
Thanks to
Dr Nick Townsend
Dr Wilby Williamson

Dr Charlie Foster
Centre for Exercise, Nutrition and Health Sciences
School for Policy Studies
charlie.foster@bristol.ac.uk
@FosteratBristol
The other side of the coin: the economic benefits of increasing physical activity

Dr Paul Kelly

Physical Activity for Health Research Centre (PAHRC)
Institute for Sport, Physical Education and Health Sciences
University of Edinburgh

2017
1. The case for physical activity
What is the most important benefit of increased walking and cycling to the people of Scotland?
open happiness™
Wouldn’t it be great if everyone decided to create a little happiness by doing something unexpected for others?
Systematic review and meta-analysis of reduction in all-cause mortality from walking and cycling and shape of dose response relationship

Paul Kelly\textsuperscript{1,2*}, Sonja Kahlmeier\textsuperscript{3}, Thomas G"otschi\textsuperscript{3}, Nicola Orsini\textsuperscript{4}, Justin Richards\textsuperscript{5}, Nia Roberts\textsuperscript{6}, Peter Scarborough\textsuperscript{1} and Charlie Foster\textsuperscript{1}

http://www.biomedcentral.com/content/pdf/s12966-014-0132-x.pdf
Happiness and physical activity?

Don't worry, be happy: cross-sectional associations between physical activity and happiness in 15 European countries

Justin Richards¹*, Xiaoxiao Jiang², Paul Kelly³, Josephine Chau¹, Adrian Bauman¹ and Ding Ding¹
Figure 6F
Adult knowledge of moderate activity guideline, 2013, by summary activity level

- Underestimated recommendation
- Knew recommendation
- Overestimated recommendation

Summary activity level:
- Very low activity
- Low activity
- Some activity
- Meets MVPA guideline

Percent:
0 10 20 30 40 50 60 70 80 90 100

UK CMO Infographic for physical activity...

2. Making the case: how to sell physical activity
How does physical activity provide economic benefit?

- Increased PA
  - Risk factors improve
    - E.g. blood pressure drops
    - E.g. Obesity reduces
  - Reduced disease incidence and prevalence
    - E.g. diabetes
  - Reduced NHS spend

££ Economic benefits ££
How does physical activity provide economic benefit?

- Increased PA
- Social connectedness
  - Community capital and cohesion
- Improved mental and social health
- Reduced NHS spend

££ Economic benefits ££
How does physical activity provide economic benefit?

Increased PA ➞ Improved health ➞ Reduced absence from work ➞ Reduction in productivity losses ➞ ££ Economic benefits ££
How does physical activity provide economic benefit?

- Improved PA spaces
- Increased PA
- More people using community facilities
- Tourism
- Increased spend

££ Economic benefits ££
How does physical activity provide economic benefit?

- Enhanced public transport
- Increased PA (walking and cycling)
- Reduced emissions and congestion
- Environmental benefits

££ Economic benefits ££
How does physical activity provide economic benefit?

Increased PA

A

D

H

K

B

E

I

L

C

F

J

M

££ Economic benefits ££
It is not just about the money...

- Children have the right to safe places to play
- Climate change
- Improved communities
- Enhanced liveability
- Quality of life
- Happiness
3. Calculating the economic benefit
ROI Tools Physical Activity

Physical activity

Improve levels of physical activity and increase positive health and non-health benefits.

Key interventions:

- counselling and advice
- activity programmes
- community and environmental
- workplace.

http://beta.roi.nice.org.uk/
Health economic assessment tools (HEAT) for walking and for cycling
The HEAT can be used to:

1. Put a value on current levels of walking and cycling

2. Estimate the economic value of increases in walking and cycling from successful interventions and policies*

3. Model the expected economic value from future interventions and policies*

*(and weigh against the costs)*
Cycling is good for health and the economy
RESULTS

Census 2001 data

2001 Census data indicated that 600 Glasgow residents commuted in and out of the city centre resulting in a total of 1,200 trips per day each with a mean trip length of 4km. Application of the HEAT tool calculation to these data yielded a mean annual benefit of nearly £1 million (€1,084,000).

Glasgow City Council cycle cordon count

Cordon count data for 2009-2012 was then used to estimate total numbers of commuting trips per day, in and out of the city centre by Glasgow residents based on a similar mean trip length of 4km (based on the 2001 Census; and corrected by a reduction of 20% to remove the impact of non-Glasgow residents’ commuting – an estimate based on 2001 Census data).

Table 1 shows the estimated number of trips per day and associated mean annual benefit for each year. Estimated mean annual benefit was just over £3 million in 2009 increasing between 2009 and 2012 to over £4 million.

Table 1. Estimated annual benefits based on Glasgow cordon count data 2009-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of trips per day</th>
<th>Estimated mean annual benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>4,171</td>
<td>£3,216,543 (€3,769,000)</td>
</tr>
<tr>
<td>2010</td>
<td>4,497</td>
<td>£3,468,495 (€4,064,000)</td>
</tr>
<tr>
<td>2011</td>
<td>4,468</td>
<td>£3,445,480 (€4,037,000)</td>
</tr>
<tr>
<td>2012</td>
<td>5,638</td>
<td>£4,348,538 (€5,095,000)</td>
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http://www.gcp.h.co.uk/assets/0000/3794/BP37_for_Web.pdf
Table 1. Estimated annual benefits based on Glasgow cordon count data 2009-2012

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Increased walking in Tayside...

Pop = 388,780

What if we could get 10% of population to increase their walking by 20 minutes per day?
Economic costs avoided in Tayside...

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of statistical life in your population is:</td>
<td>3,229,000</td>
</tr>
<tr>
<td>Based on a 5 year build up for benefits, a 5 year build up for uptake of walking, and an assessment period of 5 years</td>
<td></td>
</tr>
<tr>
<td>the average annual benefit, averaged over 5 years is:</td>
<td>9,741,000</td>
</tr>
<tr>
<td>the total benefits accumulated over 5 years are:</td>
<td>48,706,000</td>
</tr>
<tr>
<td>the maximum annual benefit reached by this level of walking, per year, is:</td>
<td>46,387,000</td>
</tr>
<tr>
<td>This level of benefit is realised in year 11 when both health benefits and uptake of walking have reached the maximum levels.</td>
<td></td>
</tr>
<tr>
<td>When future benefits are discounted by 5 % per year:</td>
<td></td>
</tr>
<tr>
<td>the current value of the average annual benefit, averaged across 5 years is:</td>
<td>7,968,000</td>
</tr>
<tr>
<td>the current value of the total benefits accumulated over 5 years is:</td>
<td>39,838,000</td>
</tr>
</tbody>
</table>

£7.97 million per year (£39.8 after 5 years)
“Applying the HEAT tool to Scottish Government travel data, [it was] estimated that if 40% of Scottish car commuter journeys of less than five miles in length were switched to cycling, the annual economic benefit after five years would be £2 billion per annum”

http://www.gcph.co.uk/assets/0000/3794/BP37_for_Web.pdf
It’s all about the message….

Lack of activity is killing people in Scotland

Current physical activity is saving lives every year…think how many more could be saved by a 2%, 5% or 10% increase

Physical inactivity is costing us millions of ££

Think how much economic benefit Scotland would experience from a 2%, 5% or 10% increase in activity levels…it’s worth the investment for all of us
IN SUMMARY

1. We need to think about our messaging – there are good news stories to be told

2. There are numerous ways increasing physical activity will deliver economic benefits – use the right one for the right audience

3. We can help model economic benefits of increasing physical activity
Any questions?

p.kelly@ed.ac.uk

@narrowboat_paul

November 2017