BOOK OF ABSTRACTS

WALK21 SATELLITE SYMPOSIUM ON TRANSPORT-RELATED PHYSICAL ACTIVITY AND HEALTH

Satellite Symposium
to the 6th International
Conference on Walking
in the 21st Century
Zurich, Switzerland

WORLD HEALTH ORGANIZATION
EUROPE

Swiss Federal Office
of Public Health

FOSPO Federal office of sports Magglingen
BASPO Bundesamt für Sport Magglingen
OFSPO Office fédéral du sport Macolin
UFSPO Ufficio federale dello sport Macolin

Magglingen, Switzerland,
September 18–20, 2005

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FOREWORD

The promotion of sports for all has a long history in Switzerland, but the promotion of health-enhancing physical activity in the broader sense has only begun after 1995, and consistent strategies and action plans have only been developed in the last few years. In the year 2000, the first Swiss Federal Government's Concept for a National Sports Policy was formulated, with health as its first main objective. Among the different strategies to get more people physically active, the promotion of Human Powered Mobility is one explicit measure. In the context of the Sports Policy Concept, Human Powered Mobility includes physical activities to get from one place to another, such as walking, cycling, running or inline skating, be it for transport, leisure or exercise.

In the development of policies and strategies for physical activity promotion in general and the promotion of human powered mobility in particular, international contacts have been crucial as they were provided through structures like the WHO Consultative Group on Active Living or the HEPA Europe Network. Recently the international activities in the field of environment and health have begun to encompass also transport-related physical activity, in particular the "Transnational Project Transport-Related Health Effects with a Particular Focus on Children" within the context of the "UNECE-WHO Pan-European Programme for Transport, Health and Environment – THE PEP".

When it was decided that the 6th international WALK21 conference was to be held in Zurich in September 2005, the Federal Office of Sports was looking for ways to focus the debate on health aspects of transport-related physical activity. Inspired by our colleagues and friends from the UKK institute for health promotion in Tampere, Finland, and by their experiences and activities – such as the organisation of a satellite symposium on Evidence-based hepa Promotion in Helsinki in 2002 – we decided to bring together researchers and experts in the context of a Satellite Symposium in Magglingen.

This Symposium is another step to bring the health aspects, the environmental, social and cultural determinants of active transport and the potential of interventions to promote it onto the agenda – be it in research or policy development. And the work will continue. The European Network for the Promotion of Health-Enhancing Physical Activity has recently been re-founded. Its secretariat at the WHO Regional Office for Europe, European Centre for Environment and Health in Rome, has launched the first joint project of the Network, "Collaboration between Physical Activity Promotion and the Transport Sector – Examples from European Countries". First insights can be expected before the end of the year.

The organising committee had the privilege to collaborate with distinguished experts in the international scientific board. We would like to thank them for their most valuable contributions and their support. We thank the Federal Office of Public Health and WHO Regional Office for Europe as well for their support of this symposium.

On behalf of the organising committee I wish you all a very warm welcome and a pleasant stay in Magglingen.

Eva Martin-Diener
Swiss Federal Institute of Sports/Division for Sport Political Affairs
Swiss Federal Office of Sports, Magglingen

PROGRAM

Sunday, September 18, 2005

14:00	Pre-registration	
15:00	Optional excursions	
18:30	Welcome reception	

Monday, September 19, 2005

08:00	Registration		Abstract
09:00	Opening	Matthias Remund Director Federal Office of Sports	
	Health effects and measurement of transport-related physical activity		
	Chairs: Bernard Marti, Switzerland and Finn Berggren, Denmark		
09:15	Health benefits of cycling commuting and changes in cycling habits	Lars-Bo Andersen, Norway	I 1
09:50	Public health applications of the Transport Travel Data Surveys – a population health perspective from Australia	Dafna Merom, Australia	I 2
10:25–10:50	Coffee break		
	Environmental determinants of transport-related physical activity		
	Chairs: Nanette Mutrie, UK and Harry Rutter, UK		
10:55	Environmental determinants of physical activity: A view from public health	Thomas Schmid, USA	I 3
11:30	Built environment correlates of physical activity: Evidence from transport research	Susan Handy, USA	I 4
12:05	International Physical Activity and the Environment Network: Key ideas, opportunities and resources	Neville Owen, Australia	I 5
12:30–14:00	Lunch break		
	Environmental determinants and presentation of posters		
	Chairs: Eva Martin-Diener, Switzerland and Brian Martin, Switzerland		
14:00	Active transport behaviour in four environmentally different neighbourhoods of Amsterdam	Frank den Hertog, The Netherlands	O 4
	Do car-free environments promote physical activity?	Oliver Thommen, Switzerland	O 20
14:50	**Presentation of Posters** (List of presentations on page 9)		
15:15-15:40	Coffee break		

	Interventions		
	Chairs: Francesca Racioppi, WHO and Neville Owen, Australia		
15:45	Effects of interventions: From randomised controlled trials to natural policy experiments	Nanette Mutrie, UK David Ogilvie, UK	I 6 O 11
16:45–17:30	The UK national cycle network: An environmental intervention promoting active travel	Philip Insall, UK	O 2
	The role of transport in children's daily physical activity	Roger L Mackett, UK	O 7
19:30	Reception		
20:00	Conference dinner		

Tuesday, September 20, 2005

			Abstract
	Policy development		
	Chairs: Ursula Ulrich-Vögtlin, Switzerland and Finn Berggren, Denmark		
09:00	Cost-Benefit-Analysis of transport-related physical activity: An introduction	Kjartan Saelensminde, Norway	I 7
	Valuing the mortality benefits of regular cycling	Harry Rutter, UK	O 15
10.00	Public health policy for physical activity: National and international perspectives	Thomas Schmid, USA	I 8
10:25–10:50	Coffee break		
10:50	**Parallel sessions** (List of presentations on page 10) **Session I: Children's active transport: Examples across Europe** *Chair: Nanette Mutrie, UK* **Session II: GIS workshop** *Chair: Pekka Oja, Finland*		
12:30–13:45	Lunch break		
	Research and policy perspectives		
	Chairs: Francesca Racioppi, WHO and Brian Martin, Switzerland		
13:45	Companies' role in promoting commuter cycling	Bas de Geus, Belgium	O 3
14.05	Public health policy for physical activity: perspectives and experiences regarding walking activities	Finn Berggren, Denmark	I 9
14:35	Looking ahead – some research and policy perspectives	Neville Owen, Australia	
	Discussion	Participants	
15:30	Closure	Brian W Martin, Switzerland	
15:45	End/Coffee break		
16:00–16.45	Side Meeting: Continuation of the morning CBA-Discussion. Conclusions and recommendations.	Experts/Participants	

POSTER PRESENTATIONS

Monday, September 19, 2005, 14:50–15:15

How long are distances in physically active commuting from home to work/study place? A methodological survey	Erik Stigell, Sweden	O 18
Physically active commuting between home and work/study place in Greater Stockholm	Erik Stigell, Sweden	O 19
Use of portable global positioning units to complement accelerometry-based physical activity monitors	Austin L Brown, USA	O 14
Can mobility patterns be changed by awareness-raising campaigns?	Oliver Thommen, Switzerland	O 21
The potential of car-free HPM-events in Switzerland to reach less active individuals	Eva Martin-Diener, Switzerland	O 9
Active transport to Kindergarten: An intervention study from Switzerland	Brian W Martin, Switzerland	O 8
BYPAD: Applying quality management techniques to improve local cycling policy	Ursula Lehner-Lierz, Switzerland	O 6

PARALLEL SESSIONS

Parallel session I: Children's active transport: Examples across Europe
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Weekday motorised and active travel in UK youth: It's were you live and not what you do	Stuart JH Biddle, UK	O 1
The prevalence of and time spent on active commuting in school children in Sweden	Phun Dang, Sweden	O 17
Understanding the barriers to children's active transport	James Paskins, UK	O 13
Perceived environmental determinants of active commuting to school in Irish adolescents	Norah Nelson, Ireland	O 10
Walking and cycling behaviour of children, adolescents and young adults in Switzerland: Results from Travel Census Surveys.	Eva Martin-Diener, Switzerland	O 16

Parallel session II: GIS workshop
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Opening	Pekka Oja, Finland	
Geographic Information Systems to objectively identify environmental attributes that influence walking: Promises and challenges?	Neville Owen, Australia	O 12
GIS as a research tool to study environment and HEPA	Susan Handy, USA	O 5
Assessing city environment for transport cycling with Geographic Information Systems: The Graz study	Sylvia Titze, Austria	O 22
General discussion	participants	

ABSTRACTS INVITED PRESENTATIONS

I 1–9

Does cycling and improvement in cycling habits prevent premature death? (I 1)

Andersen, LB
Norwegian School of Sports Science

Physical activity in general prevents a number of diseases and premature mortality. However, little is known about the effect of specific types of habitual activity such as cycling commuting. Cycling as transportation is usually a type of activity of quite low intensity because most people want to get to work without becoming too sweat. Cycling as transportation is on the other hand a type of physical activity which could be easy for the individual to integrate into everyday living, and knowledge of health gain in relation to this type of physical activity is therefore important.

Data from the prospective studies in Copenhagen was analysed.
The Copenhagen City Heart Study: Cycling in hours per week was assessed among 6,510 women and 8,466 men, 20–93 years of age, and changes in cycling habits was assessed after five years. During 162,016 person-years of observation 3,787 subjects died. Changes in cycling habits was assessed in 3,291 men and women who experienced 618 deaths.
Center for Preventive Medicine, Glostrupundersøgelserne and the Copenhagen Male Study: Cycling as transportation to work was assessed in 6,171 men and 783 women. During 145.555 person-years of follow-up 2,291 died.

About 50% of the men and 40% of the women cycled at least ones a week, but cycling decreased with increasing age, and more in women than in men. Between the age of 20 and 45 years two third of all subjects cycled every week. Among women this percentage fell to 20% in the 65+ years old, but among men 45% in the age group 65–90 years still cycled. The amount of physical activity resulting from cycling is substantial in Denmark, and 30% of the whole adult population cycled more than three hours per week, which is sufficient to fulfil the international guidelines of 30 minutes of physical activity of moderate intensity per day.

After adjustment for other types of physical activity, socioeconomic back ground, smoking, blood pressure and cholesterol levels a mortality rate of 0,7 was found in cyclists compared to those who did not report weekly cycling. A similar difference was found when only cycling to work was analysed. These two analyses were conducted on different cohorts which show a consistent pattern. Further, changes in cycling habits over five years was analysed in relation to subsequent mortality, and a mortality rate of 0.66 was found among subjects who increased cycling compared to subjects who decreased cycling. Deaths among cyclists included subjects who were killed in traffic accidents.

Public Health Application of the Transport Travel Data – a Population Health Perspective from Australia (I 2)

Merom, D
Centre for Physical Activity and Health, NSW

Australian physical activity (PA) guidelines encourage adults to be active everyday in as many ways as possible and to accumulate at least 30 minutes of moderate-intensity PA on most, preferably all, days of the week. Active transport has been identified as important setting for achieving this goal and strategies to promote its use have been put in place. However, data to evaluate this approach and support its population impact is scant. First, long-term PA surveillance systems usually focus on leisure time recreational or fitness-induced activities, but not PA for everyday purposes. Second, travel-related PA (walking/cycling) is largely incidental and might be difficult to assess based on recall time frame of weeks or months, which is the usual recall period for PA surveillance.

While transportation surveys are potential data source for evaluating population health impact of transport related PA, their standard reports primarily oriented to track changes in travel patterns measured at the aggregated level of trips and not people. Furthermore, public health definition of active transport includes walking/cycling that link with other transport modes, trips that usually ignored under the hierarchy of trip classifications that is used in transport reports. To address this gap, this presentation will apply an epidemiological approach to the secondary analyses of the Transport Data population surveys. Population estimates of walking/cycling for every day purposes, its health enhancing potential and pattern of change will be presented for adults (≥15 years) living in Sydney Greater Metropolitan.

Although walking trips in 1991 and 2001 are falling short of 10 minutes, especially the "walk-to-link" with other modes, the population prevalence of daily active adults is doubled when active travel is considered. During weekends the lowest estimates of active adults were noted. Cycling is far less common than walking, but their health potential is greater; only four out of ten "walkers" would accumulate sufficient amount throughout several continuous bouts of 10 minutes walks compared with two-thirds of cyclists. This analysis identified the trip to work as important source of PA, second to walking for exercise, recreation or sport.

Environmental Determinants of Physical Activity: A View from Public Health (I 3)

Schmid, T
Centers for Disease Control and Prevention, Physical Activity and Health Branch, Atlanta Georgia, USA

In the US, the 1996 publication of the Surgeon General's Report on Physical Activity and Health (SGR) not only served to confirm the health benefits of physical activity, but it also documented the magnitude of the challenge: the majority of people in the US did not obtain even the minimal amount of activity recommend for health benefits. This "activity deficit" cut across age, race/ethnicity, education and other social/economic variables. For the public health community the SGR served as wake up call and a challenge; how to effect **population** wide changes in physical activity. At CDC, it was recognized that like other complex behaviors, physical activity is "determined" by a wide range of interrelated factors, and efforts to promote activity would also need to come from multiple sectors of the community, using multiple and varied strategies. Public health could not do it alone, an alliance with both traditional and non traditional partners was required. To begin to build these relationships, meetings with "non traditional" partners were held, including representatives from urban planning, architecture, transportation, law, law enforcement, developers, parks and recreation. From these meetings came an agenda centered on broad-based research and interventions loosely based on the "socio-ecological model" embracing policy and environmental interventions, initially focusing on urban planning and the built environment. At that time a review of the literature found only 7 studies that explored relationships between physical activity and the environment. In the last two years dozens of articles have appeared and a high level task force has published related recommendations in the *Community Guide to Preventive Services.*

This presentation will describe CDC's and its partner's research in this area. Examples of research to be reviewed are: National and city-wide studies linking "sprawl"/community design to level of physical activity, hypertension and obesity; efforts to develop better tools to measure both the dependant (amount and type of physical activity) and independent variables (community form); research targeting the specific vs. aggregate features of community design that promote walking and cycling and how physical activity can be built back into daily living (architecture, public transit) The presentation will close with a review of the task force recommendations, and some caveats on interpreting study results from a public health perspective.

Built Environment Correlates of Physical Activity: Evidence from Transport Research (I 4)

Handy, S
Department of Environmental Science and Policy, University of California

As the obesity epidemic in the U.S. grows, public health officials are searching for both explanations and answers. One potential culprit is the built environment: low-density, segregated-use suburbs that are designed for driving rather than walking, leading people to drive more and walk less, thereby contributing to a decline in physical activity and an increase in weight. This question has long been of interest to researchers in the field of transport research, who are concerned with understanding the factors that influence travel choices, and to practitioners in the field of urban planning, who are concerned with providing alternatives to driving.

In this presentation, I first review evidence from transport research on the link between the built environment and walking behavior. Transport researchers have addressed different questions, applied different theoretical frameworks, and used different sources of data than researchers from the health field, but the evidence from these two streams of research is relatively consistent: there are strong correlations between the built environment and amounts of walking. But questions about causality remain, in particular the possibility that "self-selection" explains the observed correlations – that individuals who prefer to walk choose neighborhoods conducive to walking. Several current studies are designed to assess the role of self-selection.

Should these studies produce stronger evidence of a causal relationship between the built environment and walking, they will provide further justification for policies that enhance the walking environment. Even without this evidence, several policy movements in urban planning are underway that have targeted problems other than the decline in physical activity but should help to advance the goal of increased physical activity. The combined justification for these policies – the traditional concerns of urban planning as well as the implications for public health – should help to assure their continued proliferation. I close the presentation by discussing several of these movements and examples of the combined efforts of planners and public health officials in the U. S. to improve the built environment.

International Physical Activity and the Environment Network: Key Ideas, Opportunities and Resources (I 5)

Owen, N
Cancer Prevention Research Centre, School of Population Health, University of Queensland, Australia

Environmental and policy strategies to increase activity levels in whole populations are being widely advocated and initiated. It is crucial to build a strong scientific evidence base, to target and evaluate these new approaches. Understanding the associations (and crucially, causal relationships) between environmental attributes, physical activity behaviors and health outcomes requires careful comparisons of data, within and between countries. The network aims to: increase communication and collaboration between researchers investigating environmental correlates of physical activity; stimulate research in physical activity and the environment; recommend common methods and measures; support researchers through sharing of information, feedback, letters of support etc.; bring together data from multiple countries for joint analyses; aid in the publication of data through papers, special journal issues, symposia etc.

http://www.ipenproject.org

Effects of Interventions: From Randomised Controlled Trials to Natural Policy Experiments (I 6)

Mutrie, N[1] & Ogilvie, D[2]
[1] *Department of Sport, Culture and the Arts, University of Strathclyde, Glasgow, Scotland*
[2] *MRC Social and Public Health Sciences Unit, University of Glasgow, Scotland*

Transport-related physical activity may be influenced by measures ranging from behaviour change programmes targeted on receptive individuals to area-level transport policy and infrastructure interventions. Different types of interventions require a variety of research methods for their evaluation. We will present the results of two completed studies of behaviour change interventions, before moving on to address the methodological challenges of assessing the effects of major area-based transport projects.

Behaviour change interventions

The first study aimed to determine if a self-help intervention, delivered via written interactive materials (the "Walk in to Work Out" pack), could increase active commuting behaviour (walking and cycling). The study was a randomised controlled trial. The intervention group received the 'Walk in to Work Out' pack which contained written interactive materials based on the transtheoretical model of behaviour change, local information about distances and routes, and safety information. The control group received the pack 6 months later. Focus groups were also conducted after six months.

The participants were 295 employees who had been identified as thinking about, or doing some irregular, walking or cycling to work. The results showed that the intervention group was almost twice as likely to increase walking to work as the control group at 6 months (odds ratio of 1.93, 95% Confidence Interval of 1.06 to 3.52). The intervention was not successful at increasing cycling. The environment for cycling must be improved before cycling will become a popular option (Mutrie, et al., 2002).

The second study aimed to determine if a motivational poster (placed on bus shelters as an advert) could influence intention to "walk a stop", that is walk to the next bus stop or get off a stop early. Two trained interviewers approached individuals waiting at nine bus stops located throughout three areas of Glasgow during a one week period prior to the poster being present and a further one week period after the poster had been put in place. Of the people approached, 246 agreed to take part in the interview and 42 declined. At baseline (no posters present) the levels of intention to walk a stop were low. Gaining health and fitness and getting some fresh air were the most frequently cited motivations to walking a stop, while bad weather, lack of time and carrying heavy shopping were the most frequently cited barriers. However, respondents saw more pros than cons to walking a stop and showed high levels of self-efficacy for this behaviour indicating that encouraging people to walk a stop is a realistic goal. The responses obtained after the poster had been present

indicated a positive change in intention to walk to the next stop, but not in intention to alight a stop early and walk the rest of the way. The poster was noticed by just over half of the respondents and those in more active stages of exercise behaviour change were more likely to notice the poster.

Future research is warranted as there are positive attitudes towards this particular way of adding physical activity to everyday life. We now need to determine how best to help people incorporate walking a stop into their bus journeys (Mutrie et al., 2001).

References

Mutrie, N. et al. (2002). " 'Walk in to work out': a randomised controlled trial of a self help intervention to promote active commuting." **Journal of Epidemiology and Community Health** 56(6): 407–412.

Mutrie, N. et al. (2001). Promoting walking for bus commuters: The "walk a stop" project. Final report to Scottish executive for grant CZG/4/2/35

Cost-Benefit-Analysis of Transport-Related Physical Activity: An Introduction (I 7)

Saelensminde, K
Norwegian Directorate of Health and Social Affairs, Institute of Transport Economics

The presentation gives an introduction into cost-benefit analyses (CBAs) of transport related physical activity. CBAs of walking and cycling track networks in three Norwegian cities is used as an illustrative case. These CBAs take into account the benefit of reduced insecurity, the health benefits of the improved fitness the use of non-motorized transport provides and that a change from travel by car to cycling or walking means reduced external costs (e.g. air pollution and noise) from motorized traffic and reduced parking costs. In addition to the introduction to CBAs as a tool for better decision-making, the presentation also discusses choice of discount rates and calculation prices (e.g. the value of life and different health conditions) today and in the future.

Public Health Policy for Physical Activity: National and International Perspectives (I 8)

Schmid, T, Pratt, M
Centers for Disease Control and Prevention, Physical Activity and Health Branch, Atlanta Georgia, USA

Policy approaches are traditionally an important element of public health efforts to address major health problems. Physical inactivity is one of the leading underlying causes of death, disease, and disability in the United States and much of the world, but has only relatively recently been recognized as an important public health problem. Public health policy around physical activity remains poorly defined and developed. However, there are excellent examples of public policy and health policy approaches to other disease prevention issues such as tobacco control and injury prevention upon which a framework for public health policy for physical activity may be built. There will be two parts to this talk – 1) Organizing and conducing physical activity policy research and 2) Implementing a framework for developing national physical activity agendas. Part 1 will: Propose a definition for public health policy for physical activity; Explore and list the components of public policy for physical activity; Suggest critical areas upon which public health and public policy efforts should focus; Present a conceptual framework to help organize thinking about policy research for physical activity; Utilizing this framework in conjunction with the Community Guide Recommendations for Physical Activity, provide illustrative examples of how CDC and our partners are exploring physical activity policy research. In Part 2 the CDC physical activity policy framework, developed in response to the WHO Global Strategy for Diet, Physical Activity and Health, will be discussed. This adaptable four step process gives guidance to countries interested in developing population level programs to promote physical activity. Step in this process include:

1. Making the case for physical activity as an important public health issue;
2. Defining the country specific situation with respect to physical activity, NCDs, determinants and barriers and target populations;
3. Identifying effective strategies and interventions and the settings in which they may be applied; as well as existing interventions/programs, actors and resources; and
4. Implementing and evaluating interventions using a systematic approach drawing from successful programs from around the world.

Public Health Policy for Physical Activity: Perspectives and Experiences Regarding Walking Activities (I 9)

Berggren, F
Gerlev Sports Academy, Denmark

Perspectives and experiences regarding walking activities

Walking as a healthy physical activity may become more and more popular. In the Nordic countries the "Nordic Walking" using poles has changed the attitude to walking especially among the elderly.

Now we are facing new strategies regarding promoting walking by introduction of using pedometers to the public. The presentation will discuss the values and possibilities by using pedometers based on experiences from international and Danish projects. The two Danish cities Odense (180 000 inhabitants) and Slagelse (35 000 inhabitants) have competed in promoting and counting steps for a period of 4 weeks. As the scientific results can be questioned then the organizers may have other reasons for their campaign. The Danish Board of Health and the health organisation "HELSE" are launching a national campaign at the workplace.

What will be the next step?

ABSTRACTS OPEN PRESENTATIONS

O 1–22

Weekday Motorised and Active Travel in UK Youth: It's Where You Live Not What You Do (O 1)

Biddle, SJH[1], Gorely, T[1], Marshall, SJ[2], Cameron, N[1]
[1] *Loughborough University, UK*
[2] *San Diego State University, USA*

Recent trends suggest that active travel may be an important part of a wider physically active lifestyle. This study investigated active and inactive (motorised) travel trends in young people and predictors of motorised travel during the school week.

British school students (male n=579, female n=967; in school years 9, 10 & 11, aged 13–16 years), completed time-use diaries for 3 weekdays. At 15min intervals, participants recorded what they were doing outside the school day.

Active and motorised travel data showed slightly greater motorised travel and less active travel for older boys. However, a 2 (gender) x 3 (school year) ANOVA showed no significant main effects for gender or year, nor a significant interaction.

Bivariate correlation coefficients showed that motorised transport use was highly correlated with the distance from home to school (boys r=.71; girls r=.57) and with active travel (boys r=–.43; girls r=–.36).

A multiple regression analysis was conducted to motorised travel use. At step 1, distance from home to school and school year were entered, followed by, at step 2, time spent in 7 sedentary behaviours (TV viewing, sitting doing nothing, sitting and talking, reading, listening to music, total computer use (work and games), and cognitive hobbies), and at step 3 by time in sports and exercise. Results showed that distance from school and school year were highly predictive of motorised transport use (boys: R^2=.71; girls R^2=.33), whereas being involved in sedentary (boys: R^2=.02; girls: R^2=.05) or active behaviours (boys: R^2=.00; girls: R^2=.03) added little no additional variance.

This study suggests that inactive modes of weekday transport for adolescent boys and girls are determined more by distance from home to school and age than by a preference for sedentary or active behaviours.

The UK National Cycle Network: An Environmental Intervention Promoting Active Travel (O 2)

Cope, A[1], **Insall, P[2]**
[1] *Sustrans, Newcastle upon Tyne, United Kingdom*
[2] *Sustrans, Bristol, United Kingdom*

Over the last ten years the UK National Cycle Network (NCN) has been created by a partnership of national and local government, agencies, community groups and business, coordinated by Sustrans. In September 2005, the first 10,000 miles (16,000 km) will be declared open.

The NCN is used for active journeys of all purpose, on foot, by bicycle and also by wheelchair users, horse riders and rollers. Since the inception in 2000 of a structured programme to monitor and evaluate usage, traffic on the Network has consistently grown faster than the length of available route. In 2000, on a Network of 8,000 km, 57 million trips were made; in 2003, on 13,200 km (+65%), usage was 126 million trips (+120%). The figures for 2004 – to be included in this paper – will show continued growth.

Almost one in three trips could have been made by car, and over two thirds of users surveyed report that they are more physically active due to the availability of their local routes.

The paper will give 2004 NCN usage monitoring results, and will evaluate them in the context of UK travel trends and physical activity levels. It will outline the usage monitoring methodology adopted for the NCN. And it will give some geographical and demographic breakdown, to help with interpretation of the data. We expect the paper to demonstrate that the UK National Cycle Network is an effective environmental intervention promoting better public health through active travel.

Companies' Role in Promoting Commuter Cycling (O 3)

de Geus, B, Blancke, B, Meeusen, R
Vrije Universiteit Brussel, Brussels, Belgium

Introduction: Bicycle commuting can fight the negative effects of growth in car ownership, traffic congestion and the negative effect on the environment and therefore it should be encouraged.
Employers can affect employees' choice of transport. This study investigates the companies' actions and attitudes with regard to commuter cycling.

Methods: Hundred seventy companies, with their headquarters in the region of Flanders were contacted for a telephone interview survey from a pool of 300 Belgian companies with the highest gross turnover and having more than 200 employees. The sample was stratified to ensure response from different sectors, areas and regions in Flanders.

Results: In total 52% (n=89) of the contacted companies answered the questionnaire. Thirty nine companies only work during day-time, and 50 companies working day and night. Fifty six percent of the employers felt responsible for the mobility of their workers and 44% thought they can have an influence on the choice of transport. Only 2.2% of the companies stated the government is responsible for the mobility. Twenty percent have an Employer Transport Plan. Thirty five percent of the companies promote the bicycle as an alternative for the car. The main reasons for this are the positive image effect and/or employees' request. More than 80% are in the reimbursement system that pay a contribution to the employees' commuter cycling costs, have shower facilities and bicycle sheds. Other incentives as flexible work hours and an interest-free loan to buy a bike are rare.

Discussion/Conclusion: Large employers in Flanders claim to be willing to promote commuter cycling and provide the necessary infrastructure. However, companies' own motives are mainly image-related whereas goodwill-based commuter cycling policies are rare.

Active Transport Behaviour in Four Environmentally Different Neighbourhoods of Amsterdam (O 4)

Den Hertog, F[1], Titze, S[1,2], van Poppel, MNM[1], Oja, P[3], van Mechelen, W[1]
[1] *EMGO-Institute, VU medical centre, Amsterdam, Netherlands*
[2] *Institute of Sport Science, Karl-Franzens University, Graz, Austria*
[3] *UKK Institute, Tampere, Finland*

In order to advance the understanding of the role that physical environment may play in determining physical activity behaviour, improved methods to characterise environmental conditions relevant to people's physical activity are needed. Geographic Information System (GIS) provides potentially useful new objective methods to assess built environmental characteristics of neighbourhoods as well as the possibility to link this information with that gained by questionnaires. The purpose of the present study is to identify associations between the built environment and physical activity behaviour among urban residents in different neighbourhoods.

In co-operation with city planners four neighbourhoods in Amsterdam have been selected. They differ with regard to residential density, building design, dwelling types, transport and parking solutions, and the availability of daily facilities and services. Two of the neighbourhoods can be characterised as "garden-cities" of which one is relatively near to the city-centre and the other has a more suburban structure with less facilities but more open spaces. The two denser neighbourhoods have better access to shopping-facilities and public transport but they differ with regard to their distribution: the facilities are located in a shopping-centre in the one and scattered throughout the neighbourhood in the other.

The populations of the four neighbourhoods are comparable in sociodemographics, with a significant proportion of low SES families. In each neighbourhood 150 randomly selected households will be interviewed based on a pre-delivered questionnaire.

The following constructs will be measured by the questionnaire using documented scales: socio-demographics, environmental attributes, psychosocial constructs. Neighbourhood environmental characteristics will also be assessed by GIS-derived variables. The main outcome behaviour is physical activity as measured by the SQUASH questionnaire. Data collection will start in May 2005 and continue for 8 months. In the symposium we will be able to report preliminary results regarding the neighbourhood characteristics and selected relations between neighbourhood environment and active transport behaviour.

GIS as a Research Tool to Study Environment and HEPA (O 5)

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Although researchers studying the relationship between the built environment and physical activity have many well tested and widely used measures of physical activity at their disposal, measures of the built environment are as yet largely in consistent from study to study, rarely tested for validity or reliability, and lacking in a strong theoretical basis. The use of GIS in these studies has helped to improve the situation, though GIS presents its own limitations and challenges. GIS has played two general roles so far: as a tool for generating objective measures of the built environment from existing data sources, and as a tool for managing and transforming data collected through street-segment audits. Both of these approaches have been used in the last few years, and key examples illustrate both the potential and the limitations and challenges associated with them. In addition, GIS has the potential to play other interesting roles in this research, for example, as a way of comparing, combining or reconciling objective and perceptual measures of the environment. As researchers gain more experience with GIS as a tool for measuring the built environment, standardized approaches should emerge to ensure comparability across studies.

BYPAD: Applying Quality Management Techniques to Improve Local Cycling Policy (O 6)

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This paper presents BYPAD – Bicycle Policy Audit, an instrument for the quality management of local cycling policy, and the experiences which have been made so far with its application in almost 60 cities in 16 European countries.

BYPAD is an instrument for the quality management of local cycling policy. With BYPAD, cities and towns can put their cycling policy to test and define quality objectives for the future cycling policy. BYPAD enables cities to conduct an effective and efficient cycling policy. BYPAD is based on international experiences in cycling policy.

The BYPAD instrument has been developed in the framework of the EU research project BYPAD (1999-2001) by an international consortium and tested in seven European cities: Gent, Graz, Troisdorf, Birmingham, Zwolle, Ferrara and Grenoble. In the EU project BYPAD+, the instrument has been further developed on the experiences made so far and disseminated Europe wide. A network of 60 BYPAD cities has been set up in 16 European countries, which apply BYPAD. Audit processes are supervised by auditors who have particularly been trained. These auditors are networking and exchanging experiences on a regular basis. They are the national contact points in their countries. The BYPAD questionnaire, which is the principal item BYPAD, is translated into 11 languages. IN seven language regions, BYPAD cities and towns met in 2004 for an exchange of their experiences with BYPAD.

BYPAD is based on the idea of Total Quality Management (TQM), which has been used in the business world for long time. In view of increased cycle use and improved cyclist safety, BYPAD transfers TQM techniques to local cycling policy.

BYPAD regards local cycling policy as a dynamic process where different components need to fit together to be successful. BYPAD does not only scrutinise outcomes and effects of the local cycling policy, but also if and how this process is embedded in the political and administrative structures. BYPAD distinguishes nine modules, whose qualities are determined separately. For each module, a quality level is assigned on the BYPAD ladder of development which has four levels in total. On the basis of the results for each module, the municipality can define quality objectives separately for each module.

The BYPAD questionnaire is a principal. For each module, it contains a number of questions, 35 in total. The closed answers describe for each question appropriate activities, which are successfully implemented in European cities and towns. They are each assigned to a quality level between 1 and 4.

The whole process of evaluation and improvement is carried out by a local evaluation group, which consists of politicians, responsible for cycling, policy makers and executive staff, and representatives of the local cycle user(group)s, who use the "product" of local cycling policy.

It is planned to set up a European BYPAD quality centre with the following tasks:
– keeping BYPAD method up to date
– safeguarding its quality
– development of BYPAD-mini for small communities
– development of BYPAD-maxi for counties, agglomerations, cantons, federal states
– expanding and supporting the BYPAD network
– training of additional auditors
– dissemination of results and effetcs (e.g. presentations on conferences, fairs, newsletter, website)
– setting up a best practice database (feeding ELTIS)
– boosting the exchange between BYPAD users (e.g. workshops, study tours)

To accelerate this process, an application for an EU project containing the above described tasks was submitted in March 2005.

The Role of Transport in Children's Daily Physical Activity (O 7)

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This paper will consider the role that transport plays in providing physical activity for children by drawing upon research in which 200 children were fitted with three-dimensional accelerometers and asked to keep travel and activity diaries over a period of four days. From these instruments it is possible to establish what the children did, how they travelled and how much energy they used. It will be shown that children use fewer calories at their own homes than anywhere else, so that any form of travel is likely to lead to more physical activity because it takes them out of the house. It will also be shown that not only is walking the best mode of travel in terms of physical activity, but that walking to and from school for a week can use more calories that two hours of physical education (PE) and games lessons. It will be demonstrated that children who walk to events participate more energetically when they arrive than those who travel by car.

There has been a shift from free play to structured activities (such as football lessons) for children. This has led to a transfer from walking to the car because the latter types of event tend to be located at specific centres which are further from homes that the local streets and parks where children play. It has been found in this research that children are more energetic in free play than they are in equivalent structured activities, such as ball games.

This paper will draw together these themes of increasing car use and the shift from free play to organised structured events and home-based activities to show how children's everyday lives are involving less physical activity than in the past, with consequent implications for their health.

Active Transport to Kindergarten: An Intervention Study from Switzerland (O 8)

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In recent years, a number of initiatives for the promotion of walking to school and walking to kindergarten have come into existence in Switzerland. Some of them have found remarkable acceptance, like the "A pied, c'est mieux" project in the canton of Neuchâtel. However, the effectiveness on children's behaviour has not been systematically evaluated in any of these projects.

In Evilard, a suburban community of 2000 inhabitants on the border between the German and the French speaking part of Switzerland, a working group was initiated to improve conditions for safe walking to kindergarten, at the same time providing access to a wide range of experiences. In spring 2002 interviews were carried out with the children, their instructors and the children's parents. The number of cars delivering children to Kindergarten or passing by, and the number of children driven to Kindergarten were counted during 5 days. In 2003 and 2005 all measurements were repeated. In the meantime, a whole number of measures were introduced by the working group in co-operation with the kindergarten instructors and the school authorities: information of parents and inhabitants of the village, treatment of the issue in kindergarten and in school, rules of behaviour in the official school bus, guided walks to kindergarten from more remote parts of the village, designation of an official drop-off place further away from kindergarten. Other measures such as "pedibus" (walking bus), traffic wardens and traffic signals for pedestrian crossings were discussed but not realised during the project duration. Participation in the first parents' survey in 2002 was 80%, 79% of respondents considered protection from motorised traffic around kindergarten an important issue. On daily average, 13.5% of children reported being driven to school (not counting use of the school bus), the values for 2003 and 2005 were 16.5% and 10.2% respectively (p02 vs. 03=0.463; p02 vs. 05=0.428). The average number of cars dropping off children outside kindergarten was 4.8, 3.2 and 1.4 (p02 vs. 03=0.271; p02 vs. 05=0.018).

Though no significant reduction in the number of children driven to school was observed, the number of cars dropping them of outside kindergarten decreased significantly. Protection from motorised traffic could so be improved and the project was effective even in a setting with relatively little car traffic to start with.

First Results about the Potential of Car-free HPM-Events in Switzerland to Reach Less Active Individuals (O 9)

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The benefits of physical activity for health and well-being are widely recognized. At least half an hour of moderate intensity activities a day are recommended for adults. From the health perspective, it is most important to reach the less active segment of the population, because these individuals' health profits most from an increase in physical activity. Cycling and walking for transport or recreation are ideal activities also for those not interested in vigorous exercise or sports.

Slowup-days are car-free human powered mobility (HPM) events in Switzerland. Cyclists, hikers and skaters are invited to enjoy the roads in a scenic environment. One of the aims of these events is to activate inactive individuals to positively experience cycling or walking and motivate them to become more active in the longer run. In 2004, a total of some 200 000 participants, the majority cyclists, was counted at seven events (Swiss population: 7 millions).

An evaluation was carried out to assess if inactive individuals can in fact be reached with such an event.

At two events*, a total of 546 randomly selected participants filled in a questionnaire. Habitual physical activity and self-perceived influence of the current event or possible earlier participations on cycling and walking habits in daily life were assessed.
51.7% of the participants were not active on a regular basis compared to 64.1% in the total population. 30.1% of the insufficiently active individuals indicated a likelihood of become more active in daily life. 21.8% of those who had visited earlier Slowup events (53.5%) reported that this had motivated them to become more active.
HPM events on car-free days can create positive attitudes towards cycling and walking. They can motivate inactive individuals to be physically active and seem to have the potential to also change participants' cycling and walking habits in daily life.

*results of the evaluation of a third event site will be included

Perceived Environmental Determinants of Active Commuting to School in Irish Adolescents (O 10)

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Background: Research indicates that perceptions of the physical environment may influence physical activity in children (Timperio, Crawford, Telford, & Salmon, 2004) and adults (Humpel, Owen, & Leslie, 2002). The Take PART project (**P**hysical **A**ctivity **R**esearch for **T**eenagers) examined physical activity behaviours and perceptions of the physical environment in Irish adolescents.

Objectives: To determine the relation between perceptions of aesthetics, safety, function, destinations and neighbourhood satisfaction, and mode of commuting to school.
Methods: A one-stage cluster sample was used to recruit 15 - 17 year old adolescents (N=1506, 42% female) from 20 post-primary schools. Participants completed a self-report questionnaire assessing physical activity behaviour, and rated perceptions of neighbourhood aesthetics, safety (relating to traffic and crime), function (relating to structural features such as path design), destinations and neighbourhood satisfaction (NEWS: Saelens, Sallis,& Frank, 2003) on Likert scales. Adolescents who walked or cycled to school were classified as active commuters and those who took the car, bus or train were classified as inactive commuters.

Results: 7 Active commuters had higher perceptions of safety from traffic (28.3 vs. 27.1, $p<0.01$), function (18.3 vs. 16.9, $p<0.001$), destinations (38.3 vs. 36.1, $p<0.05$) and neighbourhood satisfaction (16.0 vs. 15.5, $p<0.01$) than inactive commuters. Among active commuters, males were more likely than females to evaluate their local neighbourhood as aesthetically pleasing (14.9 vs. 14.2, $p<0.05$). 7 Female active commuters had a higher perception of personal safety than their inactive peers (26.9 vs. 28.5, $p<0.01$). Regardless of mode of transport to school, males perceived their local environment as having higher levels of personal (20.6 vs. 20.1, $p<0.05$) and traffic safety than females (28.07 vs. 27.58, $p<0.05$).

Conclusions: Adolescents who actively commute to school have better perceptions of safety from traffic, function, and destinations and have higher neighbourhood satisfaction. Some gender differences exist. Males have higher perceptions of personal and traffic safety than females. Considering that adolescent females are a key target group for physical activity, this warrants further investigation.

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Methodological Challenges in Natural Policy Experiments (O 11)

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Major transport projects may promote or discourage physical activity through everyday walking and cycling. Recent systematic reviews have found relatively little good evidence about how area-level interventions affect transport mode choice or physical activity, or about how their benefits and harms are distributed in the population. We will present a case study of our attempts to design longitudinal studies of the effects of two major transport projects in Scotland: an urban congestion charging scheme in Edinburgh, and a new urban motorway in Glasgow.

These interventions are typical of many major transport projects. They are unique to their context. They cannot easily be separated from the other components of the transport, land use and economic policies within which they occur. When, where and how they are implemented are political decisions over which researchers have no control. The baseline data collection required for longitudinal studies needs to be planned before the intervention is certain to take place. Random allocation of the interventions is not possible. There is no simple way of defining a population or area that is exposed to the intervention or of defining control groups. Changes in quantitative measures of health or health-related behaviour may be subtle or undetectable.

We need to investigate the effects of these natural experiments, but it is very difficult to define the interventions, categorise exposure, or measure outcomes as usually understood in public health intervention research. We will present the results of our case study as a final study design in which we combine quantitative and qualitative methods in a longitudinal quasi-experimental approach, focused on assessing the effects on transport-related physical activity. The study is planned to start later this year.

Geographic Information Systems to Objectively Identify Environmental Attributes That Influence Walking: Promises and Challenges (O 12)

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Geographic Information Systems (GIS) may be used to measure objectively, the features of the built environment that may influence walking. A recent review of public health research on the environmental determinants of physical activity in adults found the most consistent evidence for accessibility of facilities, opportunities for activity, and aesthetics. Different patterns emerged for walking for recreation or exercise, compared to walking for transport. However, the majority of studies (15 from 19) were focused on perceived rather than objective measures and only two of the studies reviewed used GIS approaches to construct objective measures of the potentially relevant environmental attributes. The attributes currently believed to be of most relevance to walking for transport, and that are objectively measurable using GIS, are: **Dwelling density** (higher-density neighbourhoods support greater retail and service variety, resulting in shorter, walkable distances between facilities; driving and parking are more difficult and time consuming). **Connectivity** (higher intersection densities provide people with a greater variety of potential routes, easier access to major roads where public transport is available and shorter times to get to destinations). **Land use mix** (people who live near multiple and diverse retail opportunities tend to make more frequent and shorter shopping trips, many by walking). **Net retail area** (there are more options for destinations where goods and services may be purchased and more local employment opportunities that can be reached by walking). The influence of these attributes on walking can be examined separately, or they can be combined using methods such as those develop by Lawrence Frank, to create an index of "walkability". Initial findings using these new methods are promising. Conceptual and methodological challenges for this new area of research will be considered.

Understanding the Barriers to Children's Active Transport (O 13)

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The physical activity from active transport has the potential to provide a significant amount of a child's daily requirement. However, it is impossible for children to gain any of the health benefits associated with walking or cycling if they are prevented from doing so. To a large extent it is children's parents who determine the type and amount of travel those children take part in. When children travel with their parents, it is usually the parents who have decided the destination and the mode of travel, and if a child travels alone, it is the parents who decide the level of independence that the child is granted.

Parents must weigh up a number of factors when deciding how their children should travel. A parent's decision to take their child by car may be a response to their fears about the dangers posed by road traffic and strangers. A parent may also make an assessment of their child's ability to travel safely, and make a decision to block or limit their child's independent mobility.

This paper will deal with the limits set by parents for their children and the reasons why they have been set. These reasons include parental attitudes, urban design features and the child's cognitive skills development. This work is part of CAPABLE a broader project that is using a number of different approaches to explore children's independent mobility in their local environments. The paper will draw on the results of questionnaires given to children and their parents, interviews and classroom based activities designed to investigate children's use of, and knowledge of, the local environment.

Use of Portable Global Positioning Units to Complement Accelerometry-based Physical Activity Monitors (O 14)

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Purpose: This study examines the usefulness of complementing accelerometry-based physical activity measurement with spatial data from portable global positioning system (GPS) units to determine where physical activity occurs.

Methods: First, using the geographic distribution of data points, Bland-Altman plots, and Pearson correlation coefficients, we examined GPS units' validity and reliability by measuring the distance to a geodetic point. We also assessed inter-unit reliability by comparing GPS data from three built environment contexts. Second, we conducted a pilot in which thirty-five participants wore GPS units and activity monitors in free-living conditions for three days. Moderate and vigorous physical activity (MVPA) bouts were matched to GPS data. We classified each bout as occurring inside or outside the participant's home neighborhood. Using unpaired t-tests and Fisher's exact tests, we compared neighborhood attributes for participants having the majority of MVPA bouts within their home neighborhood, relative to those with most bouts away from their home neighborhood.

Results: Average distance from each unit to the geodetic point was 3.02m (SD 2.51). Average bias among units using Bland-Altman plots was 0.90m, ranging from -0.22 to 1.86m, within the limits of agreement. For reliability in the built environment contexts, the mean distance difference among units ranged between 10.7m (SD 11.9) and 20.1m (SD 21.8). For the pilot study involving participants, GPS data were available for 59.3% of all bouts (67% of MVPA time), of which 46% were in the participants' neighborhood. Participants obtaining most of their MVPA in their neighborhoods tend to live in areas with higher population density, housing unit density, street connectivity, and more public parks.

Conclusion: Data recorded by portable GPS units is sufficiently precise to track participants' movements. Successful matching of activity monitor and locational data suggests GPS is a promising tool for complementing accelerometry-based physical activity measures. Our pilot analysis shows evidence that the relationship between environment and activity can be clarified by examining where physical activity occurs.

Valuing the Mortality Benefits of Regular Cycling (O 15)

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Cycling is a healthy mode of transport that allows people to build physical activity into their daily lives. Fear of the perceived danger of cycling is a major disincentive to many people. But the true risks of cycling are low, and the health benefits greatly outweigh the health costs. There is one cyclist death per 34 million km cycled in England and Wales, and people who cycle an average of 3 hours a week (such as a daily commute of around 6 kilometers each way) have a relative risk of dying 39% lower than the general population (Andersen et al, 2001). There is evidence that that the more cyclists there are on the road the safer it is to cycle (Jacobsen, 2003).

If 100 000 people, evenly spread between the ages of 20 and 60, were to take up regular cycle commuting in England this would result in a net gain of 50 lives saved, equivalent to around 1600 life years, even though a small number of the additional cyclists would be expected to die on the roads. Assuming a value of £31 250 per life year this results in an annual net benefit, purely in terms of mortality, of just over £50 million; this equates to about £500 per cyclist. These calculations are based on a set of conservative assumptions, and if more realistic assumptions are used, such as increased road safety in the presence of greater numbers of cyclists, the benefits would be commensurately greater.

To obtain a sense of the resources available to support interventions to achieve this change it is helpful to consider splitting the potential £50 million/year benefit into two parts. If, for example, there were a 50:50 split this would result in £25 million to pay back interest on a government bond and £25 million on ongoing costs (e.g. for maintenance, travel planning, cycle training, etc). At an interest rate of 6% this would mean there was £416 million in advance to pay for infrastructure (£25 million per annum would be the payments on a bond of £416 million at 6%) and £25 million per year to spend on the ongoing costs (to place this in perspective the entire 11 500 km National Cycle Network has cost around £400 million to date).

Walking and Cycling Behaviour of Children, Adolescents and Young Adults in Switzerland: Results from Travel Census Surveys (O 16)

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Active transport can contribute substantially to health enhancing physical activity. As in other industrialized countries, there is public concern in Switzerland about an increasing number of children being brought to school by car.

In the National Travel Survey 2000 travel behaviour of 4468 students aged 6 to 20 years was assessed in a telephone interview. Basis for the results presented are the 6737 trips to school accumulated by those 2130 children and young adults who reported at least one trip to school on the day relevant for the interview.

Among the 6-9 year old children 76.8% walk to school, 3.6% use their bicycle, 8.1% are being brought by car, 6% walk and use public transport and 5.4% other forms of combined mobility. The respective numbers for the other age groups are:
– 10–12 years: 61.6%, 18.7%, 4.6%, 8.4%, 6.7%;
– 13–15 years: 30.9%, 27.6%, 6.3%, 24.5%, 10.8%;
– 16–17 years: 18.7%, 20.0%, 9.8%, 32.0%, 19.5%;
– 18–20 years: 19.6%, 12.0%, 21.5%, 33.8%, 12.9%.
In a logistic regression model, determinants for the choice of the different modes of transport were assessed. Short distances up to 1km increased the chance of walking compared to longer distances, while medium distances increased the use of a bicycle. Living in the German part of Switzerland was consistently associated with a higher probability of walking or cycling to school than living in the French part of the country, where on the other hand the chance of being brought by car was higher. With an increasing number of cars in the household the chance of walking to school consistently decreased.

The proportion of trips walked or cycled to school is high. In areas with high levels of walking or cycling to school, this culture must be maintained. In areas with less walking and cycling, there is a potential for improvement.

The Prevalence of and Time Spent on Active Commuting in School Children in Sweden (O 17)

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Introduction: To what extent walking or bicycling to school may contribute in meeting the daily PA recommendations of 60 min PA in Sweden is not known. Therefore we have surveyed commuting modes and time spent on active commuting in children from randomly selected schools in Sweden.

Methods: 1136 boys and 1113 girls, 9, 12 and 15 years old, participated in the study. Each of them responded to a questionnaire about their common commuting mode and active commuting time with response categories as presented below.

Results:

Age and gender	Passive commuting by car	Active commuting*				
		~10 minutes or less	~20 minutes	~30 minutes	~40 minutes	~50 minutes or more
9 f	22.0	47.3	30.8	0	0	0
9 m	27.2	43.5	29.0	0.3	0	0
12 f	11.7	28.7	31.4	14.4	9.8	4.1
12 m	8.7	43.1	26.0	13.3	5.1	4.6
15 f	9.5	29.7	32.9	16.7	7.5	3.7
15 m	8.6	38.8	29.9	13.5	4.3	4.9

Table 1. Proportion of boys and girls in each age group passively and actively commuting per day.

*Active commuting = total time spent on walking or biking to and from school or school bus/train/subway.
**The internal non-response levels were 4.2–20.5%, with the higher values in the 15 years old.
***Some children marked two answers because of divorced parents.

Discussion: The prevalence of passive commuting appears to be rather low in Sweden except within the youngest children. In this group the median active commuting time is ~10 minutes or less while the older age groups have a median time of approximately 20 minutes. No apparent gender differences exist. The result points to that the time spent on active commuting is a valuable source of PA in meeting the PA recommendations of 60 min per day.

How Long Are the Distances in Physically Active Commuting from Home to Work/ Study Place? A Methodological Survey (O 18)

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Introduction: The distances covered by physically active commuters is a basic variable for understanding the potential effects of this behaviour on public health and environment. However, few studies have focused on this. Furthermore, different methods have been used with potential sources of error. The aim of this study is therefore to focus on the validity of different potential methods.

Method: Physically active adult commuters in Greater Stockholm were contacted through advertisements. 2148 persons volunteered. A questionnaire and individually adjusted maps were sent to them. The response frequency was 93%. Here we present the results from a randomly selected subgroup (n=899) of the whole material. The map measured actual route distances were compared with the estimated distances as well as with the measured straight-line distances between home and work/study place.

Results and discussion: Assuming that accurate data is obtained through the method with a map on which the respondents draw their own commuting routes, the method of letting the respondents estimate their distance in a questionnaire is concluded to not be a valid method. Not only were the distances overestimated, but also the individual deviations were substantial. For both pedestrians and bicyclists the straight-line distance appear to be a more reliable method to use than subjective estimations of the distance. The reason for that is the finding of smaller relative deviations from average values with the straight-line distance method. Thus, the straight-line distance method is the second best method under the condition that correction is made for an underestimation of about 20–25% of measured distances of routes drawn on maps.

Physically Active Commuting between Home and Work/Study Place in Greater Stockholm (O 19)

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Introduction: An often suggested strategy for enhancing public health is to make use of the transportation between home and work/study place through e.g. walking and bicycling[1]. However, the extent to which this is a feasible strategy within the population is a question seldom addressed. In an attempt to illuminate these issues, the aim of this study is to scrutinize factors related to an existing behaviour of commuting through walking or bicycling between home and work/study place in Greater Stockholm. Our specific focus is on the constituents of common physical activity recommendations (time and intensity) as well as on the potential outcome in terms of body mass index (BMI).

Methods: Physically active commuters living in the County of Stockholm were contacted through advertisements. 2148 persons volunteered. A questionnaire and individually adjusted maps were sent to them. The response frequency was 93%. Here is presented results from a randomly selected subgroup (n=899).

Results and Discussion: A great majority of the subjects reach a commuting time of more than the physical activity recommendations of 30 minutes of moderate physical activity per day if they commute both to work/study place and back home on the same day. Average perceived exertion values (Borg scale) of 11 in pedestrians and 13 in bicyclists correspond to the verbal expression of "fairly easy" and "somewhat hard", respectively, which reasonably well correspond to the expression "moderate intensity" in the WHO recommendations. The BMI values point to that the majority of the physically active commuters are of normal weight, but a considerable proportion of the male commuters are overweight. In comparison with the population, the results indicate that physically active commuting might be a key element in avoiding obesity.

[1] WHO Economic Commission for Europe (2002). Transport, Health and Environment Pan-European Programme

Do Car-free Environments Promote Physical Activity? (O 20)

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Background: Despite all well-known benefits of physical activity, 64% of the Swiss adults do not attain the minimum recommended level of physical activity. 19.4% of the adult population are totally inactive. Increased motorization is one of the reasons associated with more sedentary and inactive lifestyles.
We hypothesized that people living in a car-free environment are more physically active than similar populations with unlimited access to cars.

Methods: In three alpine communities (Zermatt (car-free), Montana, Bagnes) in Switzerland information on moderate and vigorous intensity physical activities was collected from a representative sample of the population (n=901). Adults (18 years +) able to communicate in German or French were interviewed.
For the analysis the new indicator for the measurement of physical activity of the Federal Office of Sports was used. It consists of 5 physical activity levels (1= trained, 2=regularly active, 3=irregularly active, 4=partially active, 5=inactive). For our analysis categories 1 and 2 were defined as "sufficiently active", 3, 4 and 5 as "insufficiently active".
Community differences in activity levels were analysed by multivariate logistic regression models and expressed as Odds Ratios (ORs). Models were mutually adjusted for sex, age and community. We distinguished between moderate intensity activities, vigorous intensity activities and total physical activity (moderate and vigorous intensity activities).

Results: Compared to adults in Zermatt people in Montana and Bagnes were significantly more likely to be "insufficiently active". ORs were 1.61 (95% CI: 1.15–2.27) and 1.40 (95% CI:1.00–1.96), respectively.
Levels of vigorous intensity activities were similar in all three communities. However, compared to Montana, adults in Zermatt were significantly more likely to meet the recommendations for moderate intensity activities (2.11, 95% CI:1.45–3.10). In Bagnes these activity levels were similar to Montana (1.09, 95% CI:0.74–1.60).

Conclusions: The car-free environment in Zermatt seems to be associated with total physical activity, however behavioural differences between German and French-speaking regions may partially explain the effect.

Can Mobility Patterns Be Changed by Awareness-raising Campaigns? (O 21)

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Context: Through changes in mode of transportation, i.e. a modal shift to public and non-motorised forms of transport, physical activity can in principle easily be integrated into daily life.
The annually organised awareness-raising project "Basel bewegt, fit und gesund unterwegs", which takes place on September 22nd is one way to encourage people to use public and non-motorised forms of transport. It contributes to the European Car Free Day "In town without my car!" and consists of awareness-raising events focusing on various aspects of sustainable and constitutional mobility. The overall aim of the project is to encourage people to use public and non-motorised modes of transport. We report here on the evaluation of the event of 2004.

Aim: The main focus of the evaluation carried out by the ISPM BS, lays on the following two questions:
1) Can such an intervention produce a shift from motorized to non-motorized mobility or public transport?
2) What target group can be reached by such a campaign – previously physically active people and/or previously physically inactive individuals?

Method: The evaluation was conducted on September 22nd 2004 using a two-sided written questionnaire. The data were collected anonymously.

Results: Four companies participated in the enquiry. 273 out of 1680 employees answered the questionnaire, yielding an overall response rate of 16.25% (range between 9.2% and 42.7%).
41 (15.0%) employees reported that the event has moderately or strongly influenced their choice of transport on September 22nd.
Compared to their usual type of mobility 56 (20.5%) respondents showed a change in mobility on September 22nd, 38 (13.9%) shifted their mode of transport to work from motorized to non-motorized mobility or public transport. 16.4% of the inactive respondents and 13.7% of the active respondents changed their mode of transport to work from motorized to non-motorized mobility or public transport.

Conclusion: This awareness-raising campaign had a small but measurable impact on the shift from motorized to non-motorized or public transport and was also seen in previously physically inactive individuals.

Assessing City Environment for Cycling with Geographic Information Systems (O 22)

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The influence of the built environment on health-enhancing physical activity has recently received increasing attention. The advantage of using Geographic Information Systems (GIS) in this context is that it provides objective spatial information which can be linked with modes of transport. Thus, the purpose of our study was to assess the relationship between the built environment and cycling for transportation applying GIS based objective environmental data.

In a cross sectional sample of university students in Graz, Austria (n=538) a questionnaire was used to assess the perceived environment during cycling for transportation and the cycling behaviour. The city of Graz provided spatial data of the city environment. Students also drew their route from home to the university in a city map.

GIS is an analysing tool for spatial referenced data. The objective information (if in vector format) is based on points (e.g. traffic lights), lines (e.g. bicycle paths), and areas (e.g. parks). However, before running analyses on the relationship between the objective data and the modes of transport extensive preparatory work is needed. This includes geo-coding of addresses i.e. matching the addresses with the digitalised city map and dynamic segmentation i.e. creating the individual routes by linking all intersections from the start to the final destination.

In our presentation we will report about methodological issues one faces in the preparatory phase as well as about the ways how to operationalise the spatial data into variables applicable for quantitative statistical analysis.

PARTICIPANTS

INVITED SPEAKERS

Lars-Bo Andersen	Norwegian School of Sports Science Norway
Finn Berggren	Gerlev Sports Academy Denmark
Susan Handy	Department of Environmental Science and Policy University of California USA
Dafna Merom	Centre for Physical Activity and Health, NSW Australia
Nanette Mutrie	Department of Sport, Culture and the Arts University of Strathclyde UK
Neville Owen	Cancer Prevention Research Centre School of Population Health University of Queensland Australia
Kjartan Saelensminde	Norwegian Directorate of Health and Social Affairs Institute of Transport Economics Norway
Thomas Schmid	Centers for Disease Control and Prevention (CDC) Physical Activity and Health Branch USA

OPEN PRESENTATIONS

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Phung Dang	The Åstrand Laboratory Stockholm University College of Physical Education and Sports Sweden
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