

Report of the Workshop on integration of data on physical activity patterns

Zurich, Switzerland, 25–26 February 2009



Abstract

The World Health Organization Regional Office for Europe and the Directorate-General for Health and Consumers of the European Commission have established a joint three-year project to monitor progress in improving nutrition and physical activity and preventing obesity in the European Union. As part of this project, a workshop on the integration of data on physical activity patterns was convened in Zurich, Switzerland on 25–26 February 2009. The main aims were: to discuss the implications of the application of different physical activity data collecting protocols and existing data sources on the development of a harmonized European database; and to review a list of indicators to compare physical activity patterns and levels among all population groups across Europe.

Keywords:

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List of abbreviations

The following abbreviations are used in this report:

| | |
|----------|---|
| ALPHA | Assessing Levels of Physical Activity and fitness |
| BMI | body mass index |
| COSI | WHO European Childhood Obesity Surveillance Initiative |
| DG SANCO | Directorate-General for Health and Consumers (EC) |
| EC | European Commission |
| EHIS | European Health Interview Survey |
| EU | European Union |
| EUPASS | European Physical Activity Surveillance System |
| EUROSTAT | European Commission Statistical Office |
| GPAQ | Global Physical Activity Questionnaire |
| GSHS | Global School-based Student Health Survey |
| HBSC | Health Behaviour in School-aged Children |
| HES | Health Examination Survey |
| HIS | Health Interview Survey |
| IPAQ | International Physical Activity Questionnaire |
| MET | metabolic equivalent |
| STEPS | STEPwise approach to chronic disease risk factor Surveillance |
| WHO | World Health Organization |
| WP | work package |

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Scope and purpose

A database of national and regional surveys on overweight and obesity is currently in place in the WHO Regional Office for Europe (1). The database will be updated and expanded with the help of other databases (e.g. the WHO Global InfoBase (2)), which includes adult data only) and sources on physical activity patterns and levels. Data will be obtained as much as possible for three age groups – children, adolescents and adults. Internationally comparable physical activity data would allow benchmarking, but it is currently difficult to make intercountry comparisons owing to the use of different data collection methods, sampling designs, survey years, age ranges and definitions of physical activity or inactivity.

This workshop was organized as part of the project’s WP 1 on the surveillance of nutritional status, dietary habits and physical activity patterns. Its aims were to:

- discuss existing international data sources and selected examples of national surveys;
- recommend a list of indicators to be included in the database to compare physical activity patterns and levels among all population groups across Europe; and
- identify the main challenges and needs in countries with regard to physical activity surveillance.

Participants and programme

The workshop was attended by 16 Temporary Advisers, 7 observers and 4 staff members from the WHO Regional Office for Europe and WHO headquarters (see Annex 1 for the list of participants).

The programme began with a general presentation about the joint WHO/EC project, followed by a presentation on currently available physical activity surveillance data in the EU. Participants then discussed in parallel working groups a list of possible physical activity indicators (both for adults and children) recommended for inclusion in the database, which was continued by a plenary discussion. During the second part of the workshop, four countries were given the opportunity to shortly present their country experiences. Furthermore, international activities were presented, including the report from the WHO Physical Activity Global Surveillance Technical Meeting, which was organized back-to-back with this workshop. In the last session experiences on physical activity surveillance in children were presented. The full workshop programme can be found in Annex 2.

Trudy Wijnhoven, focal point for the project at the WHO Regional Office for Europe, chaired the workshop, supported by Sonja Kahlmeier and Lideke Middelbeek.

Welcome and introduction

The workshop was opened by Trudy Wijnhoven. The participants were welcomed by Georg Bauer on behalf of the Institute of Social and Preventive Medicine at the University of Zurich, by Urs Mäder on behalf of the Swiss Federal Office of Sport and by Nadine Stoffel-Kurt on behalf of the Swiss Federal Office of Public Health.

Joint WHO/EC project on monitoring progress on improving nutrition and physical activity and preventing obesity in the European Union, 2008–2010

At the WHO European Ministerial Conference on Counteracting Obesity, in November 2006 (3), Member States approved the European Charter on Counteracting Obesity (4), which lists goals, guiding principles and a framework for action. In May 2007, the EC adopted its White Paper on a Strategy for Europe on nutrition, overweight and obesity related health issues (5). In September 2007, the WHO Regional Committee for Europe endorsed the WHO European Action Plan for Food and Nutrition Policy 2007–2012 (6), which calls on Member States to develop and implement food and nutrition policies and translates the principles and framework provided by the Charter into specific action packages and monitoring mechanisms.

To monitor the impact of these leading policy documents and the progress made on improving nutrition and physical activity and preventing obesity in the EU, a three-year joint WHO/EC (DG SANCO) project covering the period 2008–2010 was established, entitled *"Monitoring progress on improving nutrition and physical activity and preventing obesity in*

the EU". The project's main aims are to develop a database on nutrition, physical activity and obesity prevention, including surveillance data, country policy documents, policy implementation tools and good practices, and to evaluate the status of country policy development and the implementation of key commitments contained in the above-mentioned three documents. It is led by the WHO Regional Office for Europe and the results and contents of the database will be officially endorsed by the Member States.

The seven project work packages are:

1. surveillance of nutritional status, dietary habits and physical activity patterns;
2. national policies and actions;
3. good practice in regional and local initiatives;
4. establishment of the database and management;
5. support to national surveillance and policy intelligence;
6. coordination, management and reporting; and
7. dissemination of results.

Surveillance of physical activity levels and patterns is important for the development of targeted action and the evaluation of strategies and policies. The project aims to report initially on selected key indicators that will allow intercountry comparison and benchmarking of physical activity behaviour among children, adolescents and adults across Europe. A network of National Information Focal Points from the 27 EU countries has been established to map national information sources, collate information, discuss methodological issues, assess the outcome and determine the use of the database outputs.

Overview of currently available physical activity surveillance data in the European Region

Tools and methodologies

Surveillance of physical activity can be done either through objective measurements (pedometer, accelerometer) or through subjective assessments by means of questionnaires administered by personal or telephone interview or self-administered questionnaires. Based on the currently available information, this overview showed that all national surveys identified up to now have used subjective assessments of physical activity.

The two most widely used standardized questionnaire instruments are the International Physical Activity Questionnaire (IPAQ) (7), developed in 1997 as a result of various research projects, and the Global Physical Activity Questionnaire (GPAQ) (8), developed in 2001 as part of the WHO STEPwise approach to chronic disease risk factor surveillance (STEPS) programme (9). The two questionnaires are comparable in terms of reliability and validity.

IPAQ exists in a short version (recommended for surveillance) and in a long version for research purposes. The most often used short version (IPAQ short) measures the frequency (days per week), duration (minutes) and level of intensity (vigorous, moderate, walking) of physical activity during the last seven days. Responders are asked to include all physical activity at work, during transport, at home and during leisure time. GPAQ assesses the same items but has the ability to capture life-domain-specific physical activity separately (work, transport and leisure time). Both questionnaires also assess time spent sitting on a typical day.

IPAQ has been used in several international surveys, including the World Health Survey (51 countries), the International Prevalence Study on Physical Activity (20 countries), the European Physical Activity Surveillance System (EUPASS; <http://www.public-health.tu-dresden.de/dotnetnuke3/eu/Projects/PastProjects/EUPASS/tabid/337/Default.aspx>, accessed 9 March 2010) (8 countries) and Eurobarometer I and II (15 and 27 countries, respectively). Validity and reliability testing was done in a cross-country study as well as many single-country studies.

GPAQ has been used in 58 countries across five WHO regions through STEPS. It was also used in the WHO Study on Global Ageing and Adult Health (6 countries) as well as in single-country surveys. GPAQ data have been used in national as well as regional workshops on developing physical activity policies and programmes. Validity and reliability testing was carried out in an intercountry study, the results of which are currently in press.

Available data

The presentation summarized a background paper of which a draft version was made available for the workshop (see Report no. 6 in this series). The paper gave an overview of the available international and national surveys on physical (in)activity levels and patterns in the EU countries, the surveillance methods used and the challenges experienced regarding the collection and integration of physical activity data in the EU. The presented overview was the outcome of a non-systematic review based on publicly accessible, mostly Internet-based resources such as the WHO Global InfoBase (2). Additional information was obtained from the European Health Interview and Health Examination Surveys Database (10), overview reports already available and targeted Internet searches on relevant web sites (Health Behaviour in School-aged Children (HBSC), EC Statistical Office (EUROSTAT) and web sites from national institutions responsible for physical activity surveillance), as well as expert input. The overview had to be seen as work in progress and will be complemented with information provided by the National Information Focal Points in the first country reporting template.

The main identified international, European and national surveys and sources are summarized below in chronological order.

International and European surveys

FINBALT Health Monitor

This survey has been carried out in adults since 1978 in Finland and has also included Estonia, Latvia and Lithuania later on (see also “Examples of European national surveys” below). It is carried out annually in Finland and biannually in the Baltic countries. It records the time (minutes) spent walking or riding a bicycle to and from work each day, days that include at least 30 minutes of physical exercise during leisure time that makes one mildly short of breath or perspire, and the intensity of physical activity at work (http://www.ktl.fi/portal/english/research__people__programs/health_promotion_and_chronic_disease_prevention/projects/finbalt/roskaa/finbalt_health_monitor, accessed 9 March 2010).

HBSC survey

This survey has been carried out every 4–5 years since 1993/1994 and is the only international survey among young people (11-, 13- and 15-year-olds). The latest round (2005/2006) covered 25 EU and 12 non-EU countries. Young people were asked to report the number of days over the past week that they had been physically active for a total of at least 60 minutes per day. The question was preceded by explanatory text that defined moderate-to-vigorous physical activity as “any activity that increases your heart rate and makes you get out of breath some of the time” (<http://www.hbsc.org/index.html>, accessed 9 March 2010).

World Health Survey

In 2003, WHO carried out the World Health Survey, generating physical activity data for six EU countries using IPAQ short (<http://www.who.int/healthinfo/survey/en/index.html>, accessed 9 March 2010).

Eurobarometer surveys

Data on physical activity and exercise have been collected in different surveys carried out by different EC Directorates since 1997, including the European Food Study, EUPASS in 1999/2000 and various Eurobarometer surveys (http://ec.europa.eu/public_opinion/index_en.htm, accessed 9 March 2010):

- Eurobarometer 58.2, Special Eurobarometer 183.6 (2003): Physical activity, covering 15 EU countries and including 6 physical activity questions based on IPAQ short;
- Eurobarometer 62, Special Eurobarometer 213 (2004): The citizens of the European Union and sports, covering 25 EU countries and including one item on sports participation;
- Eurobarometer 64.3, Special Eurobarometer 246 (2006): Health and food, covering 27 EU countries and including 6 physical activity questions based on IPAQ short; and
- Eurobarometer 67.3, Special Eurobarometer 283 (2007): Health and long-term care in the European Union, covering 27 EU countries and including one item on exercise frequency.

European Health Interview Survey (EHIS)

EUROSTAT is beginning to collect data on physical activity through EHIS, which aims to measure on a harmonized basis and with a high degree of comparability among EU Member States the health status, lifestyle (health determinants) and health services use of the EU citizens. The first round was carried out in 2007 in all EU Member States (http://circa.europa.eu/Public/irc/dsis/health/library?l=/methodologiessandsdatasc/healthsinterviewsurvey/2007-2008_methodology&vm=detailed&sb=Title, accessed 9 March 2010). It included six questions on physical activity based on IPAQ short, some of which were amended. The next round is foreseen for 2012/2013.

International and European databases

The *WHO Global InfoBase* is a data warehouse that collects, stores and displays information on noncommunicable diseases and their risk factors for all WHO Member States (2). Besides data on physical activity, it contains data on blood pressure, overweight/obesity, tobacco, alcohol consumption, fruit and vegetable intake, diabetes, cholesterol, oral health and visual impairment as well as country estimates on various indicators such as cause-specific mortality. It is based on data from international, national, regional and local sources.

The *European Health Interview and Health Examination Surveys Database* presents an inventory of national and multicountry health surveys implemented in EU Member States as well as European Free Trade Area and EU candidate countries, plus Australia, Canada and the United States (10). The types of survey in the database include health interview surveys (HIS), health examination surveys (HES) and combined HIS/HES surveys. At the moment, the database contains information on more than 200 health surveys.

Examples of European national surveys

Below, European national surveys identified at the time of the workshop and the year(s) in which they included questions on physical (in)activity are listed.

- *Austria*: Health interview survey, 2006
- *Belgium*: Health interview survey, 1997, 2001, 2004, 2008
- *Cyprus*: Childhood obesity in Cyprus, 1999–2000
- *Czech Republic*: Sample survey of the health status of the Czech population, 1993, 1996, 1999, 2002, 2005
- *Denmark*: Danish health and morbidity survey, 1987, 1994, 2000; Danish health interview survey, 1987, 1994, 2000, 2005
- *Estonia*: Health behaviour among the Estonian adult population, every two years since 1990
- *Finland*: Health behaviour and health among the Finnish adult population, yearly since 1978

- *France*: Health barometer, 2005, 2008; National survey on nutrition and health, 2006–2007; Individual and national survey on food consumption, 2006–2007
- *Germany*: Federal health survey, 1998
- *Ireland*: National survey of lifestyle, attitudes and nutrition, 1998, 2002, 2007
- *Italy*: Italian behaviour risk factor surveillance system, 2005, 2006, 2007, 2008; Promotion of healthy lifestyle and growth in primary school children, 2008
- *Latvia*: Health behaviour among the Latvian adult population, every two years since 1998
- *Lithuania*: Health behaviour among the Lithuanian adult population, every two years since 1994
- *Malta*: First national health interview survey, 2002
- *Netherlands*: Permanent quality of life survey, yearly since 1997; Injuries and physical activities in the Netherlands survey, since 2000 continuous interviews throughout the year; Local and national health monitor for children's health, in 2000 standardized across regions and since then repeated every four years in most regions
- *Portugal*: Fourth national health interview survey, 2005
- *Spain*: National health survey, 2006
- *Sweden*: Swedish level of living survey, 2000; National survey of public health – health on equal terms, 2004, 2005, 2006, 2007
- *United Kingdom*:
 - England: Health survey for England, yearly since 1991
 - Scotland: Scottish health survey, 1995, 1998, 2003
 - Wales: Welsh health survey, 2007.

Methodological challenges

The overview revealed that many of the international as well as a few national surveys included all or most of the 7 items of IPAQ short; this was the case in 25 of the 27 EU countries assessed through international surveys (mostly Eurobarometer surveys). From the 19 EU countries for which information on a national survey has been obtained, 5 (Austria, Belgium, France, Ireland and Portugal) included the 7 items from IPAQ short. However, many of the national surveys used non-standardized questionnaires, leading to results that are not comparable across countries.

As opposed to other world regions, the GPAQ questionnaire is not prevalent in the EU countries; based on currently available information it has only been used by France. It is, however, currently being used by non-EU countries such as Switzerland.

The overall picture of monitoring and surveillance of physical activity in Europe is patchy and incomplete. Different instruments have been used, promoted by different agencies. Where national surveys have taken place, different instruments and different concepts and indicators of physical activity and/or inactivity have been used. While most of the international surveys in Europe and five national surveys based their measurements of physical activity on IPAQ short, some of the international surveys composed their set of indicators differently (e.g. any exercise over the past two weeks, frequency of exercise during leisure time) and most of the national surveys used different items. The situation since previous reviews, such as those undertaken for the World Health Report 2002 (11) or by the EUPASS project, has not changed much.

Transport-related physical activity has been included in only a few of the identified surveys but more information might become available through travel surveys to be identified by the project's National Information Focal Points.

A review of the use of IPAQ in various surveys (EUPASS, Eurobarometer 58.2 and Eurobarometer 64.3) by several institutes shows that the use of a standardized instrument at country level does not always lead to comparable results (12). There are a number of possible explanations.

Modifications in the wording of IPAQ questions. While the EUPASS project and Eurobarometer 58.2 applied the IPAQ short as intended, some modifications were made in the Eurobarometer 64.3 survey (failure to limit the two questions on frequency of vigorous and moderate activities only to activity of at least 10 minutes' duration). As a result, the prevalence of vigorous and moderate physical activity might have been overestimated by Eurobarometer 64.3.

Differences in interview administration and data cleaning. While the EUPASS project and the Eurobarometer 64.3 survey produced fairly similar results with regard to missing data and extreme values, the Eurobarometer 58.2 data showed a distinctly different pattern. In the latter survey, there were almost no extreme values for duration of vigorous, moderate and walking activities. Such extreme values could have been probed by interviewers during the survey or might have been treated in the early stages of data analysis. As a result, the prevalence of physical activity might have been underestimated by Eurobarometer 58.2.

Differences in survey administration. No systematic information on the administration of surveys (e.g. sampling, training of interviewers, data handling) is available. It is known from survey research that such factors may influence results, and thus comparability across the available European data might have been affected.

However, there are also examples (such as Spain) where results seemed to have been quite similar across the different surveys.

While IPAQ is the most frequently used questionnaire in the European Region, GPAQ is becoming more and more common in other areas of the world. This poses a challenge in terms of cross-region comparability. Up to February 2009, 58 countries had collected data through STEPS using GPAQ, including one EU country as mentioned above, and it is about to be applied in about 50 more. GPAQ is recommended by WHO as a risk factor data collection tool for physical activity and sedentary behaviour within the concept of STEPS (9).

Thus, the main challenges regarding physical activity surveillance in the EU countries are related to:

- the use of non-standardized instruments in national surveys, leading to a lack of comparability of physical (in)activity measurements across countries (these instruments, however, have often been used over a longer periods, meaning that time-series data are available);
- the switching from national instruments to standardized instruments (IPAQ or GPAQ), leading to loss of time-series data;
- the fact that standardized instruments are often not applied or analysed according to the protocol, resulting in a lack of comparability even among surveys using the same instrument;
- the use of different definitions and recommended levels of physical activity, leading to a lack of comparability of physical (in)activity measurements within and across countries;
- difficulties in comparing time-series data from existing European surveys such as Eurobarometer, the World Health Survey and EUPASS; and
- considerations regarding comparability with other world regions (IPAQ vs GPAQ).

Working groups

Despite the great diversity of approaches to measuring the population's physical activity and the challenges set out above, more and more physical activity surveillance data are becoming available through both international and national surveys. In these surveys, many different indicators are used to measure physical activity levels and patterns. To create a comprehensive harmonized European database that enables comparisons of physical activity levels and patterns in Europe, indicators that allow for cross-country benchmarking must be selected. Therefore, of the items available from different data sources, a set of indicators for physical activity monitoring must be defined.

Based on the most frequently measured items in the surveys identified, a set of possible indicators was proposed for discussion at the workshop, as set out in Annex 3. The items represented the four key dimensions for measuring physical activity (type, frequency, duration and intensity).

Participants were divided into two working groups, with the following tasks:

- to go through the list of proposed indicators
- to assess, discuss and agree on, for each proposed indicator:
 - desirability (yes/no)
 - feasibility (yes/no)
- to add possible additional indicators to the list
- to propose about five indicators for adults and five indicators for young people to be included in the database that allow:
 - benchmarking between countries
 - (over time) assessment of trends and developments.

Both working groups assessed the list of proposed indicators and reported back to the plenary with a proposal for possible indicators for inclusion in the database. Indicators that had been assessed by both working groups as desirable and feasible were identified for inclusion. Indicators not recommended by any of the working groups were excluded, and indicators only proposed by one of the working groups as well as other proposals and comments were discussed in plenary.

Based on the working group discussions, the participants suggested the following indicators for adults and young people for inclusion in the database.

Adults

1. Percentage not reaching recommendations for physical activity for health (< 600 MET (metabolic equivalent) minutes per week, or 5 × 30 minutes / 150 minutes per week of at least moderate intensity physical activity).
2. Median and interquartile range of average time spent doing physical activity per day.
3. Median number of minutes spent sitting per day.
4. Time trends of these indicators through repeated cross-sectional surveys.

Adults, continued

The following possible additional indicators were suggested to countries for consideration, based on data availability:

- life-domain-specific indicators, such as time spent walking (which was considered as being probably the most feasible at the moment), time spent cycling, and participation in leisure time/sports or occupational physical activity; and
- intention to change one's physical activity behaviour or self-perception of current physical activity levels (as proxy indicators for data on the definition of sufficient levels of physical activity).

Young people

1. Percentage not reaching recommendations for physical activity for health (at least 60 minutes of moderate physical activity per day).
2. Median and interquartile range of average time spent doing physical activity per day.
3. Screen-time-related indicators:
 - Percentage watching television for more than 2 or 4 hours per day;
 - Percentage watching television daily;
 - Time in minutes spent watching television per day;
 - Percentage using a computer more than 3 hours per day; and
 - Percentage playing computer games more than 4 hours per day.
4. Median number of minutes spent sitting per day.
5. Time trends of these indicators through repeated cross-sectional surveys.

The following possible additional indicators were suggested for consideration, based on data availability:

- hours of mandatory physical education at school and/or the existence of respective legislation; and
- fitness-based indicators, possibly based on fitness assessment at school.

Country experiences and international activities: ongoing developments

The session began with a presentation in which suggestions were made on criteria for surveys considered for inclusion in the WHO European database. It was explained that the presentations on country experiences and international activities would serve as a further basis for defining these criteria. The following criteria were proposed for the consideration of the participants.

- Defined sampling frame:
 - adults, population-based
 - children/adolescents, population- and school-based.
- Minimum sample size (for example, 100 or 400).
- Complete original survey reports, including questionnaires and details on sampling methods.
- Use of standardized instrument for which information on validity and reliability is available.

International activities

Report from the WHO Physical Activity Global Surveillance Technical Meeting

The representative of WHO headquarters reported on the WHO Physical Activity Global Surveillance Technical Meeting that had taken place at WHO headquarters on 23–25 February 2009.

The meeting's objectives were to:

- review/recall performance of GPAQ and IPAQ in population surveys;
- examine the comparability of results from GPAQ and IPAQ data;
- discuss new evidence and how measurement and data analysis may be affected;
- examine and discuss new developments in objective measurement of physical activity;
- review and discuss international assessment of physical activity in children; and
- identify future needs for physical activity surveillance.

Physical activity surveillance and the use of surveillance data were presented for Canada, South Africa and the Eastern Mediterranean, European and Western Pacific regions of WHO. IPAQ and/or GPAQ have been used for surveillance in many countries in all of these regions. In the European Region, IPAQ has been used in several cross-national surveys but many countries mainly use established national questionnaires, making intercountry comparison difficult. There are wide variations in the contribution of different life domains to total

physical activity, and in some regions, such as the Eastern Mediterranean Region, “physical activity” is still sometimes interpreted as organized sports and exercise.

Comparing results from separate surveys using IPAQ and GPAQ in the same country revealed that, with few exceptions, for most countries GPAQ seems to produce a higher prevalence of inactivity than IPAQ of the order of 3–20%. The meeting was also presented with new ways of analysing IPAQ and GPAQ data using fewer items of the instrument, in order to see whether population levels of physical activity would be classified (e.g. reaching or not reaching the physical activity recommendations for health) as if the full set of questions were used. Currently, a research project is testing whether assessment using only “days of physical activity” (without reported time in minutes spent in physical activity) might be adequate to represent total “physical activity sufficient for health”.

The WHO Physical Activity Global Surveillance Technical Meeting concluded that regular surveillance of population levels of physical activity using standardized measures should be further promoted in all countries. A research agenda around physical activity surveillance was also formulated. It was also proposed that a “global status report” on physical activity advocacy, surveillance and best practice should be developed.

ALPHA (Assessing Levels of Physical Activity and fitness) project

The ALPHA project leader outlined the objectives of the project, which is funded by DG SANCO, as follows:

- to improve existing questionnaires measuring daily physical activity and physical activity related to workplace, active transportation and the environment;
- to develop standard operating procedures for objective assessment (accelerometry) of levels of physical activity in populations and subgroups thereof; and
- to define a test method for health-related fitness suitable for population-based monitoring among children, adolescents and adults.

The project has six work packages, including one on the improvement of existing instruments, one on urban environment- and transport-related physical activity, and one on fitness measurement. Initial results were presented, with a focus on accelerometry-based results.

Comparing estimates of the prevalence of physical activity across the Asia Pacific region: experiences and lessons for the WHO European Region

The representative of the Asia Pacific Physical Activity Network presented a recent inventory or overview of identified surveys, summarizing the use of IPAQ and GPAQ in the region (13). The aim of the report was to display surveillance data and to better understand, promote,

monitor and advocate for physical activity. Information on the prevalence of physical activity was obtained from a number of sources: a search of MEDLINE, existing databases such as the WHO Global InfoBase (2) and, for some countries, ministry web sites.

The report presents data from 29 countries of the region and comprises only population-level assessments in adults. Where possible, studies with sample sizes over 1000 were sought, an exception being made for countries that conducted studies with fewer subjects owing to their small population size. The overview was confined to national studies or to those at subnational level that provided large-scale representative population data.

For each country, survey year(s), survey instrument, sample characteristics and (if available) trend data were presented and compared with the nationally used recommendation of "sufficient physical activity for health". The overview also allowed comparison of prevalence from different instruments, confirming one of the conclusions of the WHO Physical Activity Global Surveillance Technical Meeting that IPAQ overall seems to lead to higher prevalence estimates than GPAQ and, consequently, to a higher prevalence of the respective population reaching a "sufficient" level of physical activity (in some cases as high as 90%).

The outcome of this overview underlined the need for standardized survey methods and questions, and repeating these to obtain accurate population trend information. Trend data can be used to assess the impact of population-level efforts and programmes on physical activity. However, the overview also highlighted the need to help policy-makers understand that no statements on trends or comparisons can be made within or between countries if different surveys are used.

The overview provided a good example of a possible product for the joint WHO/EC monitoring project and showed interesting approaches on how to deal with data from countries collected with different methodologies and with different definitions of "sufficient physical activity for health".

Selected country experiences on physical activity surveillance

Four national experts had been invited to provide short overviews of the situation in their countries with regard to physical activity surveillance, covering the main results, the methods used and the challenges and lessons learned.

Finland

Finland is the country with the longest tradition of physical activity surveillance in Europe. The first national FINRISK study, covering five regions, was carried out in 1972 including physical activity questions originating from a previous study ("Men Born in 1913") (http://www.ktl.fi/portal/english/research__people__programs/health_promotion_and_chronic_disease_prevention/units/chronic_disease_epidemiology_unit/the_national_finrisk_study/,

accessed 9 March 2010). The FINRISK study has been repeated every fifth year. The first annual national cross-sectional survey on health behaviours among the Finnish adult population was launched in 1978, including slightly modified physical activity questions from the FINRISK-study. In 2000, the HES-Health 2000 survey for adults with questions from IPAQ short was carried out and is to be repeated every 10 years (<http://www.terveys2000.fi/indexe.html>, accessed 9 March 2010). The IPAQ short questionnaire has also been included in the FINRISK-studies since 2002.

Finland has experienced difficulties with IPAQ short, including overestimation of physical activity levels, weak correlation between IPAQ variables and body mass index (BMI), the use of unclear time units for respondents and the inability to differentiate among different life domains.

France

Experience was reported with the various French national surveys on physical activity, carried out by three different national institutions, in addition to sports-related surveys.

- The Health Barometer Survey was carried out in 2005 and 2008 in adults. In 2005, the IPAQ short questionnaire was used while in 2008, GPAQ was used owing to the reporting of high prevalence estimates of physical activity with IPAQ. Data for both surveys were collected by telephone interview (http://www.inpes.sante.fr/Barometres/BS2005/pdf/BS2005_Activite_physique.pdf, accessed 9 March 2010).
- The Individual and National Survey on Dietary Intake was carried out in 2006/2007, based on IPAQ short but with personal interviews (<http://www.afssa.fr/Documents/PASER-Ra-INCA2.pdf>, accessed 9 March 2010).
- The National Nutrition and Health Survey was also carried out in 2006/2007, again based on IPAQ short with personal interviews (http://fulltext.bdsp.ehesp.fr/Invs/Rapports/2007/RAPP_INST_ENNS_Web.pdf?89MJX-KX39X-MQ4DX-394KQ-4XXG4, accessed 9 March 2010).

Results of the various surveys were presented, showing that despite the use of the same questionnaire and survey method, results can differ. One possible explanation for the largest observed difference in this case might lie in the different training of the interviewers.

Italy

Experience from two Italian national surveys were reported, one of them carried out in young children.

- In the survey on the promotion of healthy lifestyle and growth in primary school children, data have been collected since 2008 in 8- to 9-year-old children in 18 of the 21 Italian regions by self-administered questionnaires, filled in at school. The survey is foreseen to be repeated every second year (<http://www.epicentro.iss.it/okkioallasalute/>, accessed 9 March 2010).

- In 2005 and 2006, in the context of the Italian behaviour risk factor surveillance system survey, two cross-sectional pilot studies were carried out to test the materials and methods for the future implementation of a national surveillance system of behavioural risk factors and preventive measures. One of the pilot studies used IPAQ short. The system was implemented in 2007, based on monthly data collection by telephone interviews carried out on local level by health personnel of the health units. All Italian regions are participating (<http://www.epicentro.iss.it/passi/>, accessed 9 March 2010). The physical activity questions were adapted from the United States Behavioural Risk Factor Surveillance System physical activity module with which good experiences were made (<http://www.cdc.gov/brfss/>, accessed 9 March 2010).

In addition to the prevalence of physical activity, results were presented from self-assessments of the current physical activity level, showing that one third of the population meets the national physical activity recommendations. About one quarter of the insufficiently active population believed that they were sufficiently physically active for health. Advice on physical activity given by health care workers was also measured; only one third of the insufficiently active subjects had received advice to engage in physical activity.

The presentation also mentioned the difficulty of agreeing on universally accepted recommendations on sufficient physical activity for health, and therefore pointed out the need to collect physical activity data in a way that allowed for cut-off points to be adapted to possible changes in the definitions of what constitutes a "sufficient" level of physical activity. On the national level, it was felt more important to highlight trends and rankings, e.g. across regions, and to identify population groups at risk to guide policy-making rather than to be able to provide exact point prevalence estimates.

Netherlands

Two national population surveys that include questions on physical activity were presented.

- The Injuries and Physical Activities in the Netherlands Survey has been carried out annually since 2000 and is based on a self-administered questionnaire. Since 2006, participants have also been able to fill out the questionnaire online, and there has been good experience with this alternative (http://www.swov.nl/uk/research/kennisbank/inhoud/90_gegevensbronnen/inhoud/obin.htm, accessed 9 March 2010).
- The Permanent Quality of Life Survey addresses the consumption of medical services, health and lifestyle and has been carried out annually since 1997 (http://www.rivm.nl/vtv/object_document/o6994n16908.html, accessed 9 March 2010). It includes questions related to physical activity based on the "Short questionnaire to assess health enhancing physical activity" (14).

The different national definitions and norms for sufficient physical activity and results from both surveys were presented. Overall, results from the two surveys were fairly consistent and showed about 50% of the population reaching the recommended level of physical activity.

Physical activity surveillance in children

The last session of the workshop comprised three presentations on recent developments in physical activity surveillance in children and young people.

State of affairs and conclusions from the global meeting

The representative of WHO headquarters summarized the main points that had been discussed at the WHO Physical Activity Global Surveillance Technical Meeting, with regard to surveillance in children and young people.

First, the Global School-based Student Health Survey (GSHS) was presented. This survey assesses health behaviour in 13–15-year-old schoolchildren. It is based on a self-administered questionnaire consisting of at least 6 out of 10 possible modules, one of which is on physical activity and comprises three questions on various activities and one question on sitting. The questions are similar to those in the HBSC survey. GSHS has been implemented in about 80 countries so far, and data are available for 42 countries. In the European Region, data are available from the former Yugoslav Republic of Macedonia, while training in carrying out the survey has been conducted in Kazakhstan and Tajikistan.

Results show that, in many countries, large percentages of children do not meet current physical activity recommendations. The challenges of assessing children's physical activity with a questionnaire instrument were also addressed, including the fact that unplanned and sporadic activities are difficult to remember and intensity levels difficult to assess for children. Also, with regard to sedentary behaviour, sitting at school or during homework is not directly assessed with the GSHS instrument. In addition, particularly the walking- and cycling-related questions might be interpreted differently in different cultural and geographical situations, e.g. walking might be underreported in regions with a strong car culture. The WHO Physical Activity Global Surveillance Technical Meeting concluded that the possibility of adding simple tests such as balance tests to the physical activity module of the GSHS should be explored.

The presenter then summarized the state of affairs of one of the components of a work package of the ALPHA project on "Recommendations for assessing physical activity in children". This work package aims to produce recommendations on the measurement of physical activity in children in surveillance systems in Europe. A systematic search of all available instruments is being carried out with a focus on self-administered tools, complemented by rapid reviews of the use of pedometers and accelerometers in young people. So far, about 40 surveys have been identified on which at least some information

on reliability and validity is available. In addition, a few time-based instruments (i.e. diaries), parent/teacher proxy instruments and observation instruments have been identified. These instruments will be ranked according to reliability and validity, feasibility as surveillance instruments, suitability for different age groups and current geographical use. By the autumn of 2009, recommendations will be developed on which instruments to use for which outcome measures and for which age groups.

Measurement of physical (in)activity in the WHO European Childhood Obesity Surveillance Initiative (COSI)

This presentation summarized the approach to physical activity measurement in a WHO-led surveillance initiative that aims at measuring trends in overweight and obesity in primary-school children at two-year intervals:

- to fill the current gap in available intercountry comparable data on the nutritional status of primary-school children;
- to have a correct understanding of the progress of the epidemic; and
- to monitor routinely the policy response to the emerging obesity epidemic.

COSI consists of repeated cross-sectional or longitudinal surveys in 6-, 7-, 8- and/or 9-year-olds. Twelve EU countries and Norway participated in the first data collection round. Core items of the survey include school-related characteristics such as frequency of physical education lessons and availability of school playgrounds. Optional items include further questions on the children's physical (in)activity patterns and on modes of transport to and from school. The items had been selected based on a literature review on feasible and valid indicators for the assessment of physical (in)activity in this population group.

Monitoring physical activities in children: experience of a pilot project from Switzerland

In the framework of the Swiss Study of Childhood Asthma and Allergies with respect to Air Pollution and Climate, a pilot study was carried out to test different epidemiological tools to assess physical activity in children and adolescents and to relate physical activity behaviour to environmental determinants (http://www.ispm-unibas.ch/english/forschung_details.php?id=62, accessed 9 March 2010). Physical activity was assessed with an activity diary, combined with objective measurement by accelerometers in a subgroup of children. The diary was filled in by parents of younger children and by the adolescents themselves (or with the help of their parents).

Results showed that the largest shares of vigorous activity in children came from playing outside and from walking, followed by physical education classes at school. It was concluded that diaries allowed more subtle differences to be assessed between subgroups and over time and that, in addition to questionnaires, monitoring of physical activity in children should include objective measurements in (sentinel) subgroups. It was also pointed out that routine

monitoring could still best be organized through schools but that new ways of collaboration with schools need to be explored.

In addition to the results from the pilot study, data on active transportation to school in Switzerland from the Swiss Travel Survey (1994–2005) were presented. They showed that changes over time in mode of transport to school in Switzerland were less pronounced than in other countries and that the majority of children were still going to school on foot.

Conclusions and recommendations

In conclusion, it was pointed out that while more and more data on physical activity becomes available, consistency and comparability of the results are still posing challenges, also with regard to conveying the main messages to policy-makers. The need for more standardized recommendations, definitions and cut-off points, for example in terms of what constitutes “sufficient physical activity” was underlined in the presentations. It was also concluded that often no detailed information on survey administration was available, making the interpretation of different results more difficult. The need for validated survey instruments for children was also underlined, possibly including measures for sedentary behaviour.

Regarding the mentioned lack of correlation between the estimated energy expenditure with BMI and waist-hip-ratio by the Finnish participant, the workshop participants stressed that overweight was one of the most indirect health outcomes related to physical activity and that it was also important to consider intermediate health outcomes such as those concerned with fitness, blood indicators and cardiovascular effects.

The long time-series available in Finland provides a unique opportunity to observe changes over time, but they also point out the challenge of changing behaviour. Extensive experience with physical activity data led to the conclusion that simple and self-explanatory tools are needed to cover the whole population and to be able to differentiate between sufficiently and insufficiently active population groups. It was also concluded that, for interpreting survey results, a local expert was needed who was familiar with the cultural background and physical activity behaviour of the population in question.

The participants suggested that, for inclusion in the WHO European database, surveys needed to:

- have a clearly defined sampling frame (population-based for adults, population- and school-based for children and adolescents);
- be representative of the population in question;
- have a minimum sample size of 1000, unless no such surveys were available (larger samples would be preferable to allow subgroup analysis);

- provide complete original survey reports (including questionnaire) and publications, including details of the sampling methods;
- use a standardized instrument, unless no such surveys were available; and
- provide information on validity and reliability of the survey instruments, unless no such surveys were available.

For the time being, data on all available years would be included in the database.

It was also concluded to ensure as much as possible linkage with already existing databases, particularly the WHO Global InfoBase (2).

The participants also came to the following general conclusions.

- All countries should carry out regular surveillance of physical activity, ideally covering different age groups (children, adolescents, adults and the elderly).
- Surveys should ideally be based on a simple but “robust” instrument and aspire to be a “good enough” methodology, as the main goal is population surveillance rather than research.
- Administration of surveys and data cleaning and analysis according to protocols is crucial and detailed information on these should be recorded and be made available.
- Member States were interested in support from WHO in carrying out surveillance and addressing the related challenges.
- WHO should further promote the application of standardized tools, such as GPAQ, that have been tested for reliability and validity.
- Objective measurements should be further explored, especially in children and young people.

The WHO Regional Office for Europe will continue to address the surveillance of physical activity and to support Member States, in close coordination with other ongoing projects and activities and with the EC and WHO headquarters.

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ANNEX 2. Programme

Wednesday, 25 February 2009

13.00 – 14.00 *Registration*

14.00 – 14.15 **Welcome and introductions**

- WHO Regional Office for Europe (*Trudy Wijnhoven*)
- Institute of Social and Preventive Medicine, University of Zurich (*Georg Bauer*)
- Swiss Federal Office of Sport (*Urs Mäder*)
- Swiss Federal Office of Public Health (*Nadine Stoffel-Kurt*)

Session 1: Indicators for the European WHO monitoring database

14.15 – 14.45 **Overview of currently available physical activity surveillance data in the European Region** (*Lideke Middelbeek*)

14.45 – 16.30 **Parallel working groups on selection of PA indicators based on currently available data** (*introduction by Sonja Kahlmeier*)

- Participants will be divided into two working groups to discuss:
 - selection of PA indicators for the adult population
 - selection of PA indicators for the child/adolescent population

16.30 – 17.00 *Coffee/tea break*

17.00 – 18.00 **Reporting back to the plenary and preliminary conclusions** (*Rapporteurs of working groups*)

- Plenary discussion and preliminary conclusions on selection of indicators

19.00 *Walking tour of cycling and walking infrastructure in Zurich*

20.00 – 22.00 *Dinner reception at Restaurant Belvoirpark*

Thursday, 26 February 2009

09.00 – 10.00 **Summary of the first day and recommendations/preliminary conclusions on indicators for the database** (*Sonja Kahlmeier and Lideke Middelbeek*)

- Presentation
- Discussion

Session 2: Country experiences and international activities – ongoing developments

- 10.00 – 10.15 **Introduction to session 2 and suggestion of criteria for inclusion of surveys** (*Trudy Wijnhoven*)
- 10.15 – 10.45 **International activities**
- Report from the WHO Physical Activity Global Surveillance Technical Meeting with Temporary Advisers (*Regina Guthold*)
- 10.45 – 11.15 **Coffee/tea break**
- 11.15 – 11.45 **International activities, continued**
- ALPHA project (*Michael Sjöström*)
 - Comparing physical activity prevalence estimates across the Asia Pacific region: experiences and lessons for the European Region (*Adrian Baumann*)
- 11.45 – 12.45 **Selected country experiences on physical activity surveillance**
- Finland (*Tomi Mäkinen*)
 - Netherlands (*Willem van Mechelen*)
 - Italy (*Pirous Fateh-Moghadam*)
 - France (*Benoit Salanave*)
- 12.45 – 13.45 **Lunch**
- 13.45 – 14.30 **Physical activity surveillance in children**
- State of affairs and conclusions from the WHO global meeting (*Regina Guthold*)
 - Measurement of physical (in)activity in the WHO European Childhood Obesity Surveillance Initiative (*Trudy Wijnhoven*)
 - Experience from the Swiss research project SCARPOL (*Charlotte Braun-Fahrländer*)
- 14.30 – 15.30 **Plenary discussion**
- 15.30 – 16.00 **Coffee/tea break**
- 16.00 – 16.30 **Conclusions and recommendations for next steps**
- 16.30 **Closure**

ANNEX 3. List of proposed physical activity indicators based on currently available data

Frequently measured items and possible indicators for adults

(If a small number of countries, number given in parentheses)

- Number of days per week doing physical activity.
- Duration of physical activity in minutes on days when physical activity is reported.
- Differentiation between vigorous and moderate physical activity (described either as in IPAQ or GPAQ or in similar ways).
- Sweating on three or more days following cycling, jogging or aerobics (or other type of sweating-related question) (four countries).
- Number of days per week on which people walk for at least 10 minutes at a time.
- Average time spent walking (on days when at least 10 minutes of walking are reported).
- Pace of walking (vigorous/moderate/slow).
- Average time spent sitting during a normal weekday, or other question on sitting.
- Number of minutes per day spent walking or riding a bicycle to and from work (four countries).
- Physical activity at work during the last seven days (a lot/some/a little/none or hard/easy).
- Physical activity when moving from place to place in the last seven days (a lot/some/a little/none).
- Physical activity when working in and around the house in the last seven days (a lot/some/a little/none).
- Physical activity in recreation, sports and leisure-time activities in the last seven days (a lot/some/a little/none).
- Participating in sports at least once a week.

Possible indicators

- Percentage of the population with a low level of physical activity (< 600 MET minutes per week).
- Percentage of the population with a high level of physical activity (≥ 3000 MET minutes per week).
- Median/mean number of minutes spent doing physical activity per day.

- Percentage of the population not engaging in vigorous physical activity.
- Percentage of the population not engaging in any physical activity.
- Median/mean number of minutes spent doing sedentary activities per day.
- Percentage of the population doing walking or median/mean number of minutes spent walking per day.
- Trend in the percentage of the population with a low level of physical activity (< 600 MET minutes per week).
- Trend in the percentage of the population not engaging in any physical activity.

Desirable additional indicators for which most countries do not have data

- Median/mean number of minutes spent in work-related activity per day.
- Median/mean number of minutes spent in transport-related activity per day.
- Median/mean number of minutes spent in leisure-time-related activity per day.
- Percentage of the population not engaging in any work activity.
- Percentage of the population not engaging in any transport activity.
- Percentage of the population not engaging in any leisure-time activity.
- Composition of a population's total physical activity (the life domain that the activity mainly comes from).

Frequently measured items and possible indicators for young people

(If a small number of countries, number given in parentheses)

- Number of days per week doing physical activity.
- Duration of physical activity in minutes on days when physical activity is reported.
- Number of days per week participating in sports or structured exercise (four countries).
- Duration in minutes spent participating in sports or structured exercise (four countries).
- Differentiation between vigorous and moderate physical activity (as described in HBSC).
- Watching television on weekdays/weekends.
- Time in hours spent watching television per day.
- Playing video/computer games on weekdays/weekends.
- Time spent playing video/computer games per day.

- Time spent walking per day (three countries).
- Time in hours spent gardening and/or doing household jobs per day.

Possible indicators

- Percentage of young people meeting the guideline of at least 60 minutes of moderate physical activity per day.
- Percentage of young people watching television for more than 2 or 4 hours per day.
- Percentage of young people using a computer for more than 3 hours per day.
- Percentage of young people playing computer games for more than 4 hours per day.
- Percentage of young people participating in sports.
- Time in minutes spent doing sports per day.
- Percentage of young people doing any physical activity.
- Time in minutes spent doing any physical activity per day.
- Percentage of young people watching television daily.
- Time in minutes spent watching television per day.
- Percentage of young people playing video/computer games daily.
- Time in minutes spent playing video/computer games per day.
- Frequency of walking (possibly in bouts) per day.
- Trend in the percentage of young people doing less than 60 minutes of moderate physical activity per day.

Joint WHO/EC DG SANCO project: Monitoring progress on improving nutrition and physical activity and preventing obesity in the European Union (EU), 2008-2010

Report series

No. Title

- 1 Report of the 1st Meeting of National Information Focal Points, Brussels, Belgium, 23–24 September 2008
- 2 Report of the 2nd Meeting of National Information Focal Points, Copenhagen, Denmark, 23–24 June 2009
- 3 Report of the Meeting on community initiatives to improve nutrition and physical activity, Berlin, Germany, 21–22 February 2008
- 4 Report of the Workshop on integration of data on physical activity patterns, Zurich, Switzerland, 25–26 February 2009
- 5 Report of the Workshop on integration of data on household food availability and individual dietary intakes, Copenhagen, Denmark, 28–29 April 2009
- 6 Review of physical activity surveillance data sources in European Union Member States
- 7 Review of dietary intake surveillance data sources in European Union Member States
- 8 Review of obesity surveillance data sources in European Union Member States
- 9 Review of food and nutrition policy development and legislation in European Union Member States
- 10 Review of physical activity promotion policy development and legislation in European Union Member States
- 11 Overview of public-private partnerships aiming to prevent obesity in European Union Member States
- 12 Overview of implementation of statutory and self-regulatory codes in the area of marketing foods and beverages to children in European Union Member States

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