Revision of the Physical Activity module

Description of the problems (from MS experience)

During the EHIS survey first wave the MS used modified International Physical Activity Questionnaire (IPAQ) to evaluate population based physical activity (PA). At that time it was decided to remove the question about sedentary behaviour. According to the feedback based on member states (MS) experience, certain weaknesses in using the PA module were brought out. Some problems were pointed out only by some countries, but some of the comments were made by about half of the MS. The problems reported most often were the following:

- Difficulties to distinguish between moderate and vigorous physical activity
- Questions are difficult to understand, examples are not suitable, explanations are too long, and not clear enough.
- The same activity could be understood differently by respondents of different age, health status and living conditions. (e.g. in rural areas where physical labour is common, the performance of hard tasks could be reported as moderate activity or not mentioned at all.
- Respondents had serious problems to report not only the number of days but also the amount of time used for different levels of PA.
- There is no information about sedentary activity, which is still important concerning health.
- It is hard for the respondents to assess the whole amount of daily PA. It would be better to separately estimate occupational PA.

Some of the mentioned problems have clear reasons or explanations. Different MS have made their own modifications and too much freedom has been left to translators. A lot of different versions of IPAQ are used which makes it difficult to compare the results. Some of the MS proposed to ask PA in different domain separately, this need is confirmed by some recently published papers (Abu-Omar, Rütten, 2008).

- Definition of the concepts (underlying dimensions)

The terms used in module:
- Physical activity
- Occupational physical activity
- Leisure time
- Sleeping time

According to definition, PA is any body movement that works your muscles and uses more energy than you use when you’re resting (Caspersen et al, 1985). Public health surveys focuses more on health enhancing physical activity (HEPA). HEPA is not only sports or exercise, but all daily physical activity on at least moderate level (Meusel, 2008).

IPAQ takes into account all PA during a day. From the proposals of MS it became evident that it would be good to differentiate between occupational and leisure time PA, and add also a question about sleeping time.

Our recommendation is to use the whole package of the original short version IPAQ, which deals with the whole dimension of PA. IPAQ measures total physical activity whereas the recommendations are based on activity (usually leisure-time or recreational) over and above usual daily activities. By the HEPA recommendation regularly active adults have lower rates of heart disease and stroke, and have lower blood pressure, better blood lipid profiles, and fitness (Physical
Activity Guidelines for Americans, 2008). Significant reductions in risk of cardiovascular disease occur at activity levels equivalent to 150 minutes a week of moderate-intensity physical activity. Both aerobic (endurance) and muscle-strengthening (resistance) physical activity are beneficial. Several studies have focused on the role that physical activity plays in many health outcomes, including physical fitness, such as aerobic capacity, and muscle strength and endurance. There is strong evidence that physically active people have better health-related physical fitness and are at lower risk of developing many disabling medical conditions than inactive people (Physical Activity Guidelines for Americans, 2008).

To those who would like to separate occupational and leisure time PA and estimate about sleeping time we recommend the same additional question for all MS in order to have comparable data. Occupational PA explains physical effort of the respondent's everyday work. The lengths of sleeping explaining the daily sleep time. Insufficient sleep is associated with a number of chronic diseases and conditions — such as diabetes, cardiovascular disease, obesity, and depression — which threaten our nation’s health (Sleep and Sleep Disorders). Getting not enough sleep is associated with the onset of these diseases and also may complicate their management and outcome.

In the questionnaire structure the occupational PA questions may be part of the occupational background variable and situated separate from health determinants module. Also question about sleeping time might be of interest to other modules, such as mental health, and therefore in the structure of the questionnaire it may also be located separately of the PA issues.

- **Literature review of questionnaires with pros/cons of the different instruments under consideration**

Studies have used different instruments to assess physical activity, but we still have no consensus about harmonized methodology and tools to measure PA. Several instruments which have been used for the population based assessment of physical activity have not been validated and therefore they cannot be used for EHIS II.

Two widely used standardized short self-report or interview-based instruments for physical activity surveillance are available: One is IPAQ and the other is Global Physical Activity Questionnaire (GPAQ).

IPAQ was developed in 1997 as result of various research projects and GPAQ was developed in 2001 as part of the WHO Stepwise approach to HCD risk factor surveillance (STEPS) programme.

1) IPAQ measures the proportion of population performing moderate and vigorous physical activity (days and/or hours per week) during the past 7 days and time spent in walking for at least 10 minutes and time spent in sitting on a week day.

The long version comprises 5 PA domains: job-related PA, transportation PA, housework, house maintenance and caring for family, recreation, sport and leisure-time PA and time spent sitting. The short IPAQ form last 7 day recall is recommended for national monitoring and the long form for research requiring more detailed assessment.

2) GPAQ measures moderate and vigorous physical activity during activity at work; travel to and from places, recreational activities and in sedentary behaviors.

Pros and cons of the different instruments.

- GPAQ is very similar to the long version of IPAQ. Both assess frequency, duration and intensity of PA.
- GPAQ has 15 questions in three domains (work, travel, recreation) and is validated for use 16-84 years old compared to 7 questions of short IPAQ which is validated for use 15-69 years old.
- 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 (SAGE) (6 countries) as well as in single-country surveys.
- GPAQ questionnaire is not prevalent in the EU countries

- IPAQ requires respondents to recall PA on the past 7 days compared to a “typical week” in GPAQ.
- IPAQ measurement provides information about the patterns of total physical activity and inactivity.
- The disadvantage of IPAQ is that for the respondents it is hard to assess the whole amount of daily PA and they have serious problems to report the amount of time used for different levels of PA.
- IPAQ is by far the most tested and used in the European context (Eurobarometer (EU), 15 countries; World Health Survey (WHO), 50 countries; Int Prevalence Study (IPS), 19 countries; Eurobarometer 2 (EU), 25 countries).

**Final suggestion for the instrument + justification**

IPAQ short version has some restrictions, but it is the best instrument available at the moment to measure physical activity at the population level. It is the shortest instrument available. Its approach was the origin of the questions used in EHIS I. Unfortunately many different versions have derived from IPAQ which makes it difficult to compare the results. For this reason the original version of IPAQ should be used in EHIS II to improve comparability with already existing data from other European and international studies, and with full understanding of its underlying assumptions and limitations. The question about sitting should be included again, and the questions about time in different intensity levels should be modified back to the original version.

Problems remain with all self-reporting measures of physical activity in the international arena, as physical activity is a complex behavior; translations are available, interviewers' own understanding of the topic and the compliance with established protocols varies. Different centers or countries use diverse methods for data cleaning and analyses.

There is evidence that, for some comparisons between countries and longitudinal studies using IPAQ, these measures still have problems; but in most cases, comparisons seem to be concordant and they rank countries similarly. In population studies within individual countries, which eliminate many of the limitations in international studies, IPAQ has proved to be the most useful instrument.

In EHIS II, great effort has to be put on translation of the Questionnaire, including back-translation and testing. Interviewers’ training, the detailed development of the manual, etc are important to ensure optimal compliance with the manual and data comparability. Data cleaning and handling must be carried out centrally.

In conclusion our suggestions are:
- using the original IPAQ short version, but explain better different levels of PA and use better explanations in interviewer’s manual
- add an optional question about (1) occupational PA (2) leisure time PA (3) question about sleeping time
Presentation of instrument: questions, variables, indicators)
IPAQ short version

1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?
   
   _____ days per week

   No vigorous physical activities ➔ Skip to question 3

2. How much time did you usually spend doing vigorous physical activities on one of those days?
   
   _____ hours per day
   _____ minutes per day

   Don’t know/Not sure

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.
   
   _____ days per week

   No moderate physical activities ➔ Skip to question 5

4. How much time did you usually spend doing moderate physical activities on one of those days?
   
   _____ hours per day
   _____ minutes per day

   Don’t know/Not sure

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?
   
   _____ days per week

   No walking ➔ Skip to question 7

6. How much time did you usually spend walking on one of those days?
   
   _____ hours per day
   _____ minutes per day

   Don’t know/Not sure

7. During the last 7 days, how much time did you spend sitting on a week day?
   
   _____ hours per day
   _____ minutes per day

   Don’t know/Not sure
Additional questions.

1. In the last 7 days, how much of the following sports-related activities did you do in your leisure time?
   Endurance training, which elevates your heart beat and makes you breath more rapidly (e.g. jogging, ball games, cycling)
   _____ days per week
   _____ hours _____ minutes per day

   Muscle training, which improves or maintains strength of your muscles (e.g. weight training, sequence training, muscle exercises at home)
   _____ days per week
   _____ hours _____ minutes per day

2. In the last 7 days, how would you describe the physical activity level of your work?
   I do not currently work
   □ Go to question X
   Mainly sitting without interruptions.
   □
   Mainly sitting with short periods of physical exertion such as standing, walking, light carrying etc.
   □
   Mainly standing or walking with no extra physical exertion.
   □
   Mainly standing or walking with some extra physical exertion such as climbing stairs, light carrying or lifting etc.
   □
   A lot of physical activity with heavy physical exertion such as digging, shoveling, hacking, heavy lifting and carrying etc.
   □

3. In the last 7 days, how much did you sleep per 24 hours?
   _____ hours _____ minutes per 24 hours
### Module
Physical activity

### Indicators
PA levels: 1. Inactive; 2. Minimally Active; 3. HEPA active
Occupational PA
Leisure time PA
Sleeping time

### Definition and Concepts
IPAQ short version instrument assess all domains of activity.

### Relevant dimensions and subgroups
All ages 15+, genders and activities, all population subgroups

<table>
<thead>
<tr>
<th>Questions and variable names</th>
<th>1. During the <strong>last 7 days</strong>, on how many days did you do <strong>vigorous</strong> physical activities like heavy lifting, digging, aerobics, or fast bicycling?</th>
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<tbody>
<tr>
<td></td>
<td>____ days per week</td>
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<td></td>
<td>No vigorous physical activities <strong>Skip to question 3</strong></td>
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<tr>
<td>2. How much time did you usually spend doing <strong>vigorous</strong> physical activities on one of those days?</td>
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<td></td>
<td>____ hours per day</td>
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<td>____ minutes per day</td>
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<td></td>
<td>Don’t know/Not sure</td>
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</table>

| 3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking. |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | ____ days per week                                                                                                                                 |
|                              | No moderate physical activities **Skip to question 5**                                                                                             |

| 4. How much time did you usually spend doing **moderate** physical activities on one of those days? |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | ____ hours per day                                                                                                                                     |
|                              | ____ minutes per day                                                                                                                                   |
|                              | Don’t know/Not sure                                                                                                                                 |

| 5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time? |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | ____ days per week                                                                                                                                 |
|                              | No walking  **Skip to question 7**                                                                                                           |

| 6. How much time did you usually spend **walking** on one of those days? |
7. During the last 7 days, how much time did you spend sitting on a week day?

____ hours per day
____ minutes per day

Don't know/Not sure

Additional questions (optional): leisure time PA, occupational PA and sleeping time

1. In the last 7 days, how much of the following sport related activities did you do in your leisure time?

   Endurance training, which elevates your heart beat and makes you breath more rapidly (e.g. jogging, ball games, cycling)
   ____ days per week
   ____ hours ____ minutes per day

   Muscle training, which improves or maintains strength of your muscles (e.g. weight training, sequence training, muscle exercises at home)
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   ____ hours ____ minutes per day

2. In the last 7 days, how would you describe the physical activity level of your work?

   I do not currently work

   - Mainly sitting without interruptions.
   - Mainly sitting with short periods of physical exertion such as standing, walking, light carrying etc.
   - Mainly standing or walking with no extra physical exertion.
   - Mainly standing or walking with some extra physical exertion such as climbing stairs, light carrying or lifting etc.
   - A lot of physical activity with heavy physical exertion such as digging, shoveling, hacking, heavy lifting and carrying etc.

3. In the last 7 days, how much did you sleep per 24 hours?

   ____ hours ____ minutes per 24 hours

Rationale

IPAQ is by far the most tested and used in the European context. It is the shortest measure available. Problems remain with all self-reporting measures of physical activity in the international arena, as physical activity is a complex behavior; translations are
different from each other, interviewers’ own understanding of the topic and the compliance with established protocols varies. Different centers or countries use diverse methods for data cleaning and analyses. IPAQ has proved to be the most useful instrument.

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Insufficient sleep is associated with a number of chronic diseases and conditions—such as diabetes, cardiovascular disease, obesity, and depression—which threaten our nation’s health. Getting not enough sleep is associated with the onset of these diseases and may also complicate their management and outcome.

Several studies have focused on the role that physical activity plays in many health outcomes, including physical fitness, such as aerobic capacity, and muscle strength and endurance. There is strong evidence that physically active people have better health-related physical fitness and are at lower risk of developing many disabling medical conditions than inactive people.

### Remarks

By the questionnaire structure the occupational PA questions may be part of the occupational background variables and situated separate from health determinats module. Also the question about sleeping time might give extra information to other modules, such as mental health, and therefore in the structure of the questionnaire, it may also be located separately from the PA issues.

### Calculation

1. Inactive; This is the lowest level of physical activity. Those individuals who do not meet the criteria for Categories 2 or 3 are considered ‘insufficiently active’

2. Minimally Active; a) 3 or more days of vigorous activity for at least 20 minutes per day OR b) 5 or more days of moderate-intensity activity or walking for at least 30 minutes per day OR c) 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.

3. HEPA active Any one of the following 2 criteria
   • Vigorous-intensity activity on at least 3 days and accumulating at least 1500 METminutes/week OR
   • 7 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 3000 MET-minutes/week


enhancing physical activity across the European Union countries: The Eurobarometer Study. J Public Health (Springer); 14:291-300.
