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Title: Levels of physical activity among adults 18-64 years old in 28 European countries

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Keywords: Europe; motor activity; sedentary lifestyle; MET-minute; prevalence

Corresponding Author: Dr. Filippos T Filippidis, MD, MPH

Corresponding Author's Institution: Imperial College London

First Author: Vasiliki Gerovasili

Order of Authors: Vasiliki Gerovasili; Israel Agaku; Constantine Vardavas; Filippos T Filippidis, MD, MPH

Abstract: Background: Sedentary lifestyle is associated with more than three million deaths annually. Data from the 2013 Eurobarometer survey were analysed to assess levels of physical activity across the European Union (EU) and to explore factors associated with adequate and high physical activity. Methods: A representative sample of n=19,978 individuals aged 18-64 years from the 28 EU countries (sub-sample of the Eurobarometer survey, wave 80.2) was analysed. Frequency and average duration of walking, moderate and vigorous physical activity was assessed with a self-reported questionnaire. Participants were then classified as physically inactive or adequately/highly active, based on the World Health Organization's (WHO) recommendations. The total amount of MET-minutes (MET-mins) per week was also calculated for each respondent.

Results: The proportion of physically inactive individuals was 28.6%, (12.4% in Sweden to 53.7% in Cyprus), while 59.1% of the respondents (37.9% in Portugal and Cyprus to 72.2% in Sweden) were classified as highly active. The mean total weekly physical activity was 2,151 MET-mins (95%CI: 2,095-2,206), of which 891 MET-mins (95%CI: 858-924) were contributed by vigorous exercise, 559 MET-mins (95%CI: 540-578) by moderate exercise (excluding walking) and 690 MET-mins (95%CI: 673-706) by walking. Male gender, younger age, residence in rural areas and Northern Europe, higher education level and ability to pay bills were independently associated with higher physical activity.

Conclusion: One fourth of the EU population did not meet the WHO recommendations for physical activity, with wide inequalities between and within countries. Wide-reaching environmental approaches are required to promote physical activity and address these inequalities.

Dear Editor,

We submit the revised manuscript entitled “**Levels of physical activity among adults 18-64 years old in 28 European countries**” in order to be considered for publication in Preventive Medicine.

We have responded to all the minor comments made by the reviewers and have edited the relevant sections of the paper.

All authors have read and have approved the manuscript submitted and the full disclosure of any potential conflict of interest. None of the paper’s contents have been previously published and the submitted paper is not under consideration elsewhere.

Corresponding author is Dr. Filippos T Filippidis.

Sincerely yours,

Filippos T Filippidis

School of Public Health, Imperial College London
Reynolds Building, St Dunstan's Road, London W6 8RP
E-mail: f.filippidis@imperial.ac.uk
Telephone: +44 (0)20 7594 7142

Reviewer #1: The authors have addressed all questions and concerns from my original review.

Minor revisions:

1. I suggest that the authors check all abbreviations in the abstract and manuscript for consistency to ensure that all abbreviations are spelled for the first time and used as abbreviations after that. (For example, WHO and EU).

We thank the reviewer for the suggestion. Indeed, we checked all abbreviations and spelled them out the first time they are mentioned and as abbreviations all subsequent times.

2. Spell "METs-minutes" with using capital letters for MET throughout the manuscript.

We have checked the entire manuscript and tables and updated the spelling as suggested.

3. Page 7, line 49: Revise word "repost"

It has been corrected.

Reviewer #2: The manuscript has been revised to include walking as a moderate intensity activity when determining whether or not individuals accumulated adequate levels of physical activity to meet guidelines. This has resulted in a much more coherent set of findings. However, some minor revisions would add clarity. These are noted below.

Results

Lines 24-42 and Table 2.

As noted in your response to reviewers, walking is treated as a moderate-intensity activity. For clarity, consider using the terminology "moderate (excluding walking)" rather than "moderate" when presenting the results for this variable.

We thank the reviewer for this comment. We have indeed changed the wording as suggested both in the Results section and in Table 2, in order to clarify that moderate activity does not include walking. We also changed the term in the Methods section, in order to ensure consistency.

Line 49

"repost" should be "report"

It has been corrected.

Lines 51 and 52

Education was not associated with high levels of physical activity. Instead of reporting that the effect size was smaller, it should be reported that there was no association.

We thank the reviewer for spotting this error. We have updated the text for education, which now reads "which was not associated with being highly active".

Lines 53-59.

In fact, living in a rural area or in Northern or Western Europe was associated with higher total weekly physical activity, and these results were similar to those for both adequate and high levels of physical activity. Therefore, I suggest replacing "while" with "and".

This has been changed.

- 28.6% of the EU population did not meet the WHO recommendations for physical activity
- There were wide inequalities between and within countries.
- Males, younger individuals and those with higher income were more physically active.

Levels of physical activity among adults 18-64 years old in 28 European countries.

Vasiliki Gerovasili^a, Israel T. Agaku^b, Constantine I. Vardavas^{b,c}, Filippos T. Filippidis^d

^a Ergospirometry and Rehabilitation, Medical school, National and Kapodistrian University of Athens, Greece

^b Department of Social and Behavioral Sciences, Center for Global Tobacco Control, Harvard School of Public Health, Boston, Massachusetts, USA

^c Clinic of Social and Family Medicine, School of Medicine, University of Crete, Heraklion, Greece

^d School of Public Health, Imperial College London, United Kingdom

Corresponding author:

Filippos T Filippidis

Address: School of Public Health, Imperial College London, 350 The Reynolds Building, St. Dunstan's Road, London W6 8RP, United Kingdom

Tel: +44 (0)20 7594 7142

Email: f.filippidis@imperial.ac.uk

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ABSTRACT

Background: Sedentary lifestyle is associated with more than three million deaths annually. Data from the 2013 Eurobarometer survey were analysed to assess levels of physical activity across the European Union (EU) and to explore factors associated with adequate and high physical activity.

Methods: A representative sample of n=19,978 individuals aged 18-64 years from the 28 EU countries (sub-sample of the Eurobarometer survey, wave 80.2) was analysed. Frequency and average duration of walking, moderate and vigorous physical activity was assessed with a self-reported questionnaire. Participants were then classified as physically inactive or adequately/highly active, based on the World Health Organization's (WHO) recommendations. The total amount of MET-minutes (MET-mins) per week was also calculated for each respondent.

Results: The proportion of physically inactive individuals was 28.6%, (12.4% in Sweden to 53.7% in Cyprus), while 59.1% of the respondents (37.9% in Portugal and Cyprus to 72.2% in Sweden) were classified as highly active. The mean total weekly physical activity was 2,151 MET-mins (95%CI: 2,095–2,206), of which 891 MET-mins (95%CI: 858-924) were contributed by vigorous exercise, 559 MET-mins (95%CI: 540-578) by moderate exercise (excluding walking) and 690 MET-mins (95%CI: 673-706) by walking. Male gender, younger age, residence in rural areas and Northern Europe, higher education level and ability to pay bills were independently associated with higher physical activity.

Conclusion: One fourth of the EU population did not meet the WHO recommendations for physical activity, with wide inequalities between and within countries. Wide-reaching environmental approaches are required to promote physical activity and address these inequalities.

Keywords: Europe, motor activity, sedentary lifestyle, MET-minute, prevalence

INTRODUCTION

Sedentary lifestyle is aetiologically associated with more than 3 million deaths annually and reduces life expectancy by 0.68 years (Cornelissen and Fagard, 2005; Lim et al., 2012).

Despite the well-established health benefits of physical activity (World Health Organization, 2007, 2011) 28.2% of men and 34.4% of women aged ≥ 15 years worldwide are estimated to be physically inactive (World Health Organization, 2011). However, in high income countries, the proportions are estimated as high as 41% and 48% respectively (Mendis et al., 2011; World Health Organization, 2010).

According to the World Health Organization (WHO) guidelines concerning physical activity, adults aged 18-64 years should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week, or do at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity (World Health Organization, 2010).

Europe-wide data on physical activity levels of the population are available for children and adolescents (Currie et al., 2008), but not so much for adults. Country-specific studies (Borodulin et al., 2015; Filippidis et al., 2014; Ng et al., 2011; Salanave et al., 2012; Wallmann-Sperlich and Froboese, 2014), as well as international comparisons with limited number of European countries (Bauman et al., 2009; Demarest et al., 2014) have been conducted, while studies that included all member countries of the European Union (EU) have focused on either leisure-time (Van Tuyckom et al., 2013) or sports physical activity only (Van Tuyckom et al., 2010). Differences in sampling and methods of assessment of physical activity limit comparability between studies. Therefore, we conducted a secondary analysis of cross-sectional data from the 2013 Eurobarometer survey in order to assess the levels of physical activity across the EU and to explore socio-demographic factors associated with adequate and high levels of activity, according to the WHO recommendations.

METHODS

Data source

We analysed data from the Eurobarometer survey, wave 80.2 (European Commission, 2014). Data were collected in November-December 2013 and the total sample consisted of n=27,919 individuals from the 28 EU member countries. A representative sample of residents aged ≥ 15 years was selected through a multi-stage sampling design in each of the 28 countries. Respondents were selected from households with probability proportional to population size and density. Interviews were conducted in people's homes and in the language of each country. For the present study analysis was restricted to individuals 18-64 years old.

Measures

Sociodemographic data

Data were collected on respondents' gender (male; female), age (15-24; 25-39; 40-54; or ≥ 55 years); area of residence (rural area or village; town); education level attained, which was measured in the survey as age at completion of full-time education (≤ 15 ; 16-19; or ≥ 20 years); frequency at which respondents reported experiencing difficulty paying monthly bills—a proxy for income (“most of the time”; “from time to time”; “almost never/never”).

Member countries were grouped into four sub-regions, based on the United Nations geoscheme (United Nations Statistics Division): Southern Europe (Croatia, Greece, Italy, Malta, Portugal, Slovenia, Spain, and Republic of Cyprus), Western Europe (France, Belgium, Austria, Germany, The Netherlands, Luxembourg), Northern Europe (Denmark, Ireland, United Kingdom, Latvia, Lithuania, Estonia, Finland, Sweden), and Eastern Europe (Slovakia, Czech Republic, Hungary, Poland, Bulgaria, Romania).

Physical activity

Frequency and duration of three types of physical activity were assessed: vigorous activity, moderate activity (excluding walking) and walking. Frequency was assessed with the questions “In the last 7 days, on how many days did you do vigorous physical activity like lifting heavy things, digging, aerobics or fast cycling?”; “In the last 7 days, on how many days did you do moderate physical activity like carrying light loads, cycling at normal pace or doubles tennis? Please do not include walking”; and “In the last 7 days, on how many days

1 did you walk for at least 10 minutes at a time?”. Respondents were asked to report a number
2 of days between zero and seven. Duration of each type of physical activity was assessed with
3 the question “In general, on days when you do [type of activity], how much time in total do
4 you usually spend at it?”. Response options included 30 minutes or less; 31 to 60 minutes; 61
5 to 90 minutes; 91 to 120 minutes; more than 120 minutes; never do [type of activity]; don’t
6 know. These are slightly modified questions derived from the International Physical Activity
7 Questionnaire (IPAQ), which has been validated in several settings (Lee et al., 2011).
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12 In order to compare the reported physical activity to the WHO guidelines, the total time spent
13 walking, doing moderate and vigorous activity was calculated for each individual, by
14 multiplying the number of days during which they engaged in each type of activity with the
15 amount of time they usually spend when doing such activities. To simplify calculations, an
16 answer of “30 minutes or less” was assumed to mean 15 minutes, an answer of “31 to 60
17 minutes” was assumed to mean 45 minutes, “61 to 90 minutes” 75 minutes, “91 to 120
18 minutes” 105 minutes and “more than 120 minutes” 120 minutes.
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27 Individuals who reported at least 150 minutes of moderate physical activity -including
28 walking- or at least 75 minutes of vigorous activity per week, or an equivalent combination of
29 moderate and vigorous activity and therefore met the WHO guidelines for physical activity,
30 were classified as doing adequate physical activity. Those who reported at least 300 minutes
31 of moderate physical activity, or at least 150 minutes of vigorous activity per week, or an
32 equivalent combination of moderate and vigorous activity, were classified as reporting high
33 levels of physical activity (World Health Organization, 2010).
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40 We also used Metabolic Equivalents of Task (METs) to estimate total physical activity per
41 week. Each type of activity was assigned a MET value (Ainsworth et al., 2011), based on
42 energy expenditure estimates used in the IPAQ (The IPAQ Group). Energy expenditure of
43 walking was estimated at 3.3 METs, other moderate activity at 4 METs and vigorous activity
44 at 8.0 METs. The total amount of MET-minutes (MET-mins) per week was calculated for
45 each respondent, according to reported time spent walking and doing moderate or/and
46 vigorous physical activity.
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56 *Statistical analysis*

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Analysis was restricted to individuals aged 18-64 years. Proportions are presented as %, with 95% Confidence Interval (95% CI). Multivariate logistic regression models assessing determinants of adequate (compared to physical inactivity) and high levels (compared to non-high levels) of physical activity were fitted. Independent variables included age; education; geographic region; area of residence; and difficulty in paying bills. Results are presented as adjusted Odds Ratios (aOR) with 95% Confidence Interval (95% CI). Total MET-minutes are presented as mean value with 95% CI. A linear regression model, including the same independent variables as above, was fitted to explore associations between sociodemographic variables and the total amount of MET-minutes of physical activity reported by respondents. Data were weighted to ensure nationally representative estimates, and analyses were performed with Stata 12.0.

RESULTS

After excluding individuals younger than 18 or older than 64 years, a final sample of 19,978 was analysed. In all 28 EU countries the proportion of physically inactive individuals was 28.6% (95% CI: 27.6%-29.6%), while 71.4% (95% CI: 70.4%-72.4%) were classified as adequately active according to WHO guidelines. Furthermore, 59.1% (95% CI: 58.0%-60.2%) of participants were classified as highly active. There was great variability between countries with the highest proportion of inactive individuals noted in Southern European countries, such as Cyprus (53.7%), Portugal (50.6%) and Malta (48.7%), and the lowest proportion in Northern and Western Europe, namely in Sweden, (12.4%), the Netherlands (14.9%) and Finland (15.9%). Sweden (72.2%), Germany (71.5%) and Latvia (71.4%) presented with the highest proportion of highly active individuals (Table 1).

The mean total weekly physical activity in the EU was 2,151 MET-mins (95% CI: 2,095 – 2,206), of which 891 MET-mins (95% CI: 858 - 924) were contributed by vigorous exercise, 559 MET-mins (95% CI: 540 - 578) by moderate exercise (excluding walking) and 690 MET-mins (95% CI: 673 - 706) by walking. Latvia (3,027 MET-mins), followed by Estonia (2,910 MET-mins) and Germany (2,751 MET-mins) had the highest total physical activity levels. On the contrary, countries in Southern Europe presented with the lowest levels of physical activity, namely Portugal with 1,139 MET-mins per week, followed by Italy (1,259 MET-mins) and Cyprus (1,321 MET-mins). Vigorous physical activity ranged from 382 MET-mins (Portugal) to 1,386 MET-mins (Latvia), whereas moderate activity (excluding walking) ranged from 226 MET-mins in Malta to 980 MET-mins in the Netherlands. Finally, respondents in Spain (952 MET-mins) reported the most time walking and respondents in Cyprus the least (339 MET-mins) (Table 2).

Results from the logistic regression model showed that male gender, younger age, residence in rural areas, higher education level and less difficulty to pay bills were independently associated with being adequately active. Residents of Western and Northern Europe were also more likely to report adequate level of physical activity compared to Southern Europeans. Results for high levels of activity were similar, with the exception of education, which was not associated with being highly active (Table 3). Similarly, male gender, younger age and higher education level –but not ability to pay bills- were independently associated with higher total weekly physical activity as assessed with MET-

mins, and individuals living in rural areas and in Northern or Western Europe (compared to Southern Europe) had higher total weekly physical activity (Table 4).

DISCUSSION

Our study showed great variation in levels of physical activity between EU countries, measured either as prevalence of adequate moderate and vigorous weekly activity based on the WHO recommendations or as MET-minutes per week. Approximately one fourth of the adult population below 65 years of age were classified as physically inactive. Northern and Western Europeans reported higher levels of activity compared to Southern Europeans, while several socio-demographic factors, including gender, age, ability to pay bills and education were associated with reported levels of physical activity.

This is the first study to assess levels of physical activity in all 28 members of the EU. Comparisons between some European countries have been published in the past (Bauman et al., 2009; Demarest et al., 2014). Studies in individual countries are abundant (Borodulin et al., 2015; Filippidis et al., 2014; Ng et al., 2011; Salanave et al., 2012; Wallmann-Sperlich and Froboese, 2014), but the variability in questionnaires and definitions used do not allow reliable comparisons between countries. Our results were quite consistent with previously published studies, with some exceptions, such as Portugal, in which respondents reported much less physical activity in the present study. These exceptions may reflect methodological differences or simply changes over time.

The great differences between European countries in levels of physical activity are not surprising, as the EU is a diverse entity with cultural, environmental and social differences between its member countries. For example, higher temperatures have been associated with less physical activity (Bosdriesz et al., 2012) and higher Gross Domestic Product per capita associated with more physical activity (Cameron et al., 2013), which might partly explain why respondents in Northern and Western Europe reported higher activity levels compared to people in Southern Europe. Even beyond the physical environment though, not all European countries promote physical activity with the same rigour, as evidenced by the huge variation in the annual instruction time of physical education in primary and secondary schools throughout the EU (European Commission Education Audiovisual and Culture Executive Agency Service tools, 2014).

Respondents who had no difficulty in paying bills, as well as those with more years of full-time education were more likely to be adequately and highly active compared to those with some or frequent difficulties in paying bills and lower educational level respectively.

Previous studies have shown similar differences in leisure time activity (Demarest et al.,

2014), while occupational activity was higher among adults of low socio-economic level (Beenackers et al., 2012). We assessed overall physical activity, without distinction between occupational and leisure time activity, therefore we were not able to measure any potential differences in the patterns between the two types of physical activity. Men were also more likely to report higher levels of activity compared to women. This is a common finding in many, but not all European countries (Bauman et al., 2009; Salanave et al., 2012; Van Tuyckom et al., 2010; Wallmann-Sperlich and Froboese, 2014), which may reflect different gender roles between member countries (Bosdriesz et al., 2012).

Finally, differences in reported walking time may reflect different patterns of active travel within the EU. The physical environment, walkability of neighbourhoods and access to shops and services have been associated with more walking at a population level in Europe (Van Holle et al., 2012), therefore differences between countries, as well as between rural and urban areas are to be expected. This finding also highlights the policy implications of our analysis. Active transportation may be an effective approach to increase levels of physical activity in Europe, which currently are below the WHO recommendations in a significant proportion of the adult population. Improved physical environment and walking and cycling facilities may lead to increased physical activity (Van Dyck et al., 2013; Van Holle et al., 2012), while increased use of public transportation can have a similar effect (Rissel et al., 2012). Therefore, promotion of active travel should be encouraged throughout the EU and combined with existing strategies to increase physical activity, which has been set as a priority by the WHO (World Health Organization, 2007, 2010).

Strengths and limitations

To the authors' knowledge, this is the first study to assess walking, moderate and vigorous physical activity in all member countries of the EU. The sample was representative of each country, the same questionnaire was used in all countries and all surveys took place within a period of a few weeks; therefore, we are able to make reliable cross-country comparisons within the EU. Moreover, we used two different approaches (recommended physical activity and total MET-mins), which allowed us to paint a more nuanced picture of the average physical activity levels in each country. On the other hand, assessing physical activity with a questionnaire largely relies on respondents accurately reporting their activities. This may not always be possible, but questionnaires is the method of choice to assess physical activity in

epidemiological studies (Lagerros and Lagiou, 2007). Moreover, in the present analysis, we treated all activity reported in the question about walking as “brisk walking”, even though the wording of the question did not explicitly exclude low-intensity walking; thus, activity levels may have been overestimated. Potential inaccuracies in reporting, as well as limitations arising from the actual questions used mean that we could only collect approximate data on each individual’s activity levels. However, there is no indication that any measurement error was non-random, hence it is unlikely that it has introduced bias in the comparisons between countries.

Conclusions

Physical activity among individuals aged 18-64 varied widely between member countries in the EU, with about one quarter of them not achieving the recommended by the WHO levels of physical activity. Gender, educational and other socio-demographic inequalities exist as well. European governments, as well as the EU as a whole need to adopt wide-reaching environmental approaches in order to promote physical activity and address these inequalities.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

DISCLAIMER

Dr. Israel Agaku initiated the reported research while affiliated with the Center for Global Tobacco Control at Harvard University. He is currently affiliated with the Centers for Disease Control and Prevention's Office on Smoking and Health. The research in this report was completed and submitted outside of the official duties of his current position and does not reflect the official policies or positions of the Centers for Disease Control and Prevention.

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Table 1. Proportion of individuals aged 18-64 years classified as physically inactive, adequately and highly active in the European Union, 2013.

Country	Physically inactive % (95% CI)	Adequately active* % (95% CI)	Highly active % (95% CI)
<i>Southern Europe</i>			
Croatia	21.6 (18.7-24.5)	78.4 (75.5-81.3)	67.0 (63.7-70.3)
Cyprus	53.7 (48.3-59.1)	46.3 (40.9-51.7)	37.9 (32.6-43.2)
Greece	38.1 (34.6-41.6)	61.9 (58.4-65.4)	48.5 (44.9-52.2)
Italy	47.4 (43.8-51.0)	52.6 (49.0-56.2)	41.9 (38.3-45.5)
Malta	48.7 (42.4-55.1)	51.3 (44.9-57.6)	41.8 (35.4-48.2)
Portugal	50.6 (46.9-54.4)	49.4 (45.6-53.1)	37.9 (34.3-41.6)
Slovenia	28.5 (25.2-31.8)	71.5 (68.2-74.8)	59.5 (55.9-63.1)
Spain	20.3 (17.4-23.1)	79.7 (76.9-82.6)	68.5 (65.3-71.8)
<i>Western Europe</i>			
Austria	23.6 (20.5-26.7)	76.4 (73.3-79.5)	64.3 (60.8-67.9)
Belgium	32.0 (28.7-35.3)	68.0 (64.7-71.3)	52.3 (48.7-55.9)
France	29.5 (26.0-32.9)	70.5 (67.1-74.0)	57.8 (54.1-61.5)
Germany	16.1 (13.5-18.7)	83.9 (81.3-86.5)	71.5 (68.4-74.7)
Luxembourg	17.8 (13.6-21.9)	82.2 (78.1-86.4)	67.1 (61.8-72.5)
The Netherlands	14.9 (12.1-17.7)	85.1 (82.3-87.9)	71.0 (67.3-74.6)
<i>Northern Europe</i>			
Denmark	17.6 (14.4-20.7)	82.4 (79.3-85.6)	66.6 (62.6-70.6)
Estonia	20.0 (16.8-23.1)	80.0 (76.9-83.2)	70.6 (67.0-74.2)
Finland	15.9 (12.7-19.1)	84.1 (80.9-87.3)	66.5 (62.3-70.8)
Ireland	24.8 (21.3-28.3)	75.2 (71.7-78.7)	58.5 (54.4-62.5)
Latvia	19.4 (16.6-22.1)	80.6 (77.9-83.4)	71.4 (68.2-74.5)
Lithuania	24.3 (21.2-27.5)	75.7 (72.5-78.8)	63.6 (60.0-67.1)
Sweden	12.4 (9.6-15.3)	87.6 (84.7-90.4)	72.2 (68.2-76.2)
United Kingdom	24.2 (20.8-27.5)	75.8 (72.5-79.1)	64.1 (60.3-67.9)
<i>Eastern Europe</i>			
Bulgaria	33.3 (29.8-36.9)	66.7 (63.1-70.2)	57.4 (53.6-61.3)
Czech Republic	27.2 (24.0-30.3)	72.8 (69.7-76.0)	60.2 (56.7-63.7)
Hungary	32.8 (29.3-36.2)	67.2 (63.8-70.7)	52.7 (49.1-56.4)
Poland	44.0 (40.0-47.9)	56.0 (52.1-60.0)	43.2 (39.2-47.2)
Romania	27.9 (24.3-31.6)	72.1 (68.4-75.7)	59.8 (55.8-63.8)
Slovakia	28.1 (24.9-31.4)	71.9 (68.6-75.1)	57.7 (54.0-61.3)
28 EU countries	28.6 (27.6-29.6)	71.4 (70.4-72.4)	59.1 (58.0-60.2)
*meeting WHO guidelines			

Table 2. Mean weekly MET-mins of walking, moderate, vigorous and total physical activity among individuals aged 18-64 years in the European Union, 2013.

Country	Total physical activity Mean MET-mins (95% CI)	Vigorous activity Mean MET-mins (95% CI)	Moderate* activity Mean MET-mins (95% CI)	Walking Mean MET-mins (95% CI)
<i>Southern Europe</i>				
Croatia	2546 (2353-2739)	1115 (993-1237)	696 (632-760)	749 (694-804)
Cyprus	1321 (1090-1553)	722 (570-873)	254 (186-321)	339 (280-399)
Greece	1611 (1458-1764)	667 (570-764)	397 (344-451)	543 (501-585)
Italy	1259 (1138-1380)	534 (463-605)	291 (255-327)	413 (375-452)
Malta	1379 (1149-1610)	523 (370-676)	226 (159-293)	626 (532-720)
Portugal	1139 (1026-1252)	382 (314-450)	235 (196-275)	524 (480-569)
Slovenia	2019 (1858-2181)	834 (729-940)	589 (528-650)	625 (577-674)
Spain	2166 (2014-2318)	736 (641-830)	475 (421-529)	952 (900-1004)
<i>Western Europe</i>				
Austria	2428 (2228-2628)	1063 (950-1177)	733 (668-799)	611 (562-661)
Belgium	1981 (1819-2143)	832 (726-937)	655 (594-715)	500 (454-547)
France	2270 (2068-2472)	1017 (889-1146)	588 (519-657)	669 (614-724)
Germany	2751 (2570-2932)	1080 (972-1188)	839 (774-905)	792 (741-844)
Luxembourg	2174 (1943-2406)	899 (747-1050)	576 (491-661)	736 (650-821)
The Netherlands	2634 (2431-2837)	982 (861-1104)	980 (903-1056)	663 (604-721)
<i>Northern Europe</i>				
Denmark	2198 (2022-2374)	858 (745-971)	684 (613-756)	652 (592-712)
Estonia	2910 (2667-3153)	1353 (1201-1505)	693 (621-766)	846 (779-913)
Finland	2200 (2021-2379)	955 (843-1068)	579 (516-641)	665 (609-722)
Ireland	1926 (1752-2100)	825 (719-931)	449 (396-502)	644 (592-697)
Latvia	3027 (2819-3236)	1386 (1249-1524)	831 (756-905)	835 (781-889)
Lithuania	2379 (2195-2563)	1008 (885-1130)	581 (516-645)	781 (723-838)
Sweden	2415 (2214-2616)	998 (862-1135)	652 (574-730)	777 (706-848)
United Kingdom	2543 (2318-2768)	1086 (950-1221)	598 (524-671)	858 (790-926)
<i>Eastern Europe</i>				
Bulgaria	2054 (1861-2248)	881 (761-1001)	432 (369-494)	764 (711-816)
Czech Republic	2348 (2158-2539)	1005 (889-1121)	640 (574-706)	682 (631-734)
Hungary	2229 (2034-2425)	1159 (1024-1295)	627 (563-691)	454 (414-494)
Poland	1461 (1293-1628)	676 (576-776)	297 (253-341)	461 (409-513)
Romania	2373 (2148-2599)	1013 (877-1148)	575 (503-647)	834 (774-893)
Slovakia	2156 (1974-2337)	962 (852-1073)	451 (397-505)	734 (678-791)
28 EU countries	2151 (2095-2206)	891 (858-924)	559 (540-578)	690 (673-706)

* excluding walking

Table 3. Socio-demographic factors associated with being adequately and highly active among individuals aged 18-64 years in the European Union, 2013.

		Being adequately active* aOR (95% CI)	Being highly active aOR (95% CI)
Gender			
	Female (ref)	1.00	1.00
	Male	1.57 (1.42-1.74)	1.52 (1.38-1.67)
Age (years)			
	≥55 (ref)	1.00	1.00
	40-54	1.23 (1.07-1.40)	1.22 (1.07-1.38)
	25-39	1.54 (1.34-1.78)	1.48 (1.30-1.68)
	18-24	2.18 (1.78-2.66)	1.88 (1.58-2.24)
Education (age at completion)			
	≤15 (ref)	1.00	1.00
	16-19	1.07 (0.91-1.25)	1.04 (0.90-1.21)
	≥20	1.46 (1.24-1.72)	1.13 (0.97-1.32)
Region			
	Southern Europe (ref)	1.00	1.00
	Western Europe	1.79 (1.56-2.06)	1.56 (1.37-1.77)
	Northern Europe	1.86 (1.58-2.19)	1.60 (1.38-1.86)
	Eastern Europe	0.94 (0.83-1.07)	0.90 (0.80-1.01)
Area of residence			
	Rural	1.00	1.00
	Urban	0.81 (0.73-0.91)	0.87 (0.79-0.96)
Difficulty in paying bills			
	Almost never/ never (ref)	1.00	1.00
	From time to time	0.79 (0.70-0.88)	0.82 (0.74-0.91)
	Most of the time	0.77 (0.67-0.90)	0.78 (0.68-0.90)
*meeting WHO guidelines			

Table 4. Socio-demographic factors associated with total physical activity (in MET-minutes per week) among individuals aged 18-64 years in the European Union, 2013.

	Total MET-mins Coefficient (95% CI)
Gender	
Female (ref)	
Male	691 (582 - 799)
Age (years)	
≥55 (ref)	
40-54	319 (184 - 455)
25-39	596 (451 - 741)
18-24	766 (565 - 966)
Education (age at completion)	
≤15 (ref)	
16-19	-69 (-257 - 119)
≥20	-255 (-454 - -56)
Region	
Southern Europe (ref)	
Western Europe	848 (705 - 990)
Northern Europe	859 (681 - 1037)
Eastern Europe	249 (121 - 378)
Area of residence	
Rural	
Urban	-384 (-504 - -264)
Difficulty in paying bills	
Almost never/ never (ref)	
From time to time	-104 (-229 - 22)
Most of the time	-81 (-265 - 102)



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Vasiliki Gerovasili

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