Step Up! Tackling the Burden of Insufficient Physical Activity in Europe

OECD

World Health Organization
European Region

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Please cite this publication as:
OECD/WHO (2023), *Step Up! Tackling the Burden of Insufficient Physical Activity in Europe*, OECD Publishing, Paris, https://doi.org/10.1787/500a9601-en.

ISBN 978-92-64-78810-7 (print)
ISBN 978-92-64-41030-5 (pdf)
ISBN 978-92-64-92337-9 (HTML)
ISBN 978-92-64-57386-4 (epub)

World Health Organization
ISBN 978-92-89058-21-6 (pdf)

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Corrigenda to publications may be found on line at: www.oecd.org/about/publishing/corrigenda.htm.

Foreword

Being physically active is one of the most important things people can do to improve their physical and mental health. It prevents a range of non-communicable diseases, improves cognitive functioning and sleep quality, prevents falls, and reduces symptoms of depression and anxiety. Considering both the impact of the COVID-19 restrictions on physical activity levels and the rising burden of non-communicable diseases and mental health conditions, increasing physical activity is now more important than ever.

Yet, despite the wide range of health benefits, one in three European adults does not meet recommended physical activity levels. According to OECD and WHO/Europe analysis, this will result in 11.5 million new cases of non-communicable diseases by 2050, costing European Union Member States on average 0.6% of their health care budget every year. While this may seem a small amount, it is equivalent to the total health care expenditure of Lithuania and Luxembourg combined. Though policy makers have made significant efforts across the European Union to increase population-level physical activity, more can and needs to be done to step up action on physical activity.

Step up! Tackling the Burden of Insufficient Physical Activity in Europe, jointly produced by the OECD and WHO/Europe, makes the economic case for investing more in physical activity policy. It shows the potential impact that increasing physical activity levels would have on population health and the economy: increasing the life expectancy of people who are insufficiently active by 7.5 months, preventing more than 10 000 premature deaths per year, and saving European Union Member States a total of EUR PPP 8 billion per year.

The report also provides policy options to increase physical activity, drawing on case studies from across the European Union. It highlights the wide range of policy options available, from setting- or target-group specific policies like interventions in schools, workplaces or the health care setting, to policies to increase access to sports facilities or encourage active transport and outdoor activities.

Investing in physical activity policies improves individual well-being and population health, while also returning EUR 1.7 in economic benefits for every EUR 1 invested. Now that the most restrictive COVID-19 measures have been lifted and societies are re-opening, it is time to move towards a more active future.

Acknowledgements

This report is the result of a collaboration between the Organisation for Economic Co-operation and Development (OECD) and the World Health Organization Regional Office for Europe (WHO/Europe). WHO/Europe led on Chapters 1 and 2, which were authored by Viktória Anna Kovács and Stephen Whiting. OECD led on Chapters 3 and 4, which were authored by Sabine Vuik, with input from Alexandra Aldea who led the modelling work. Michele Cecchini oversaw the project for the OECD, and Kremlin Wickramasinghe for WHO/Europe.

Many more people deserve credit for the work presented in this report. The production of this report benefited greatly from the inputs and comments received from other OECD and WHO/Europe colleagues, national experts, member states representatives and other stakeholders.

Within OECD, the authors would like to thank Lucy Hulett for the editorial assistance, and Hannah Whybrow for administrative assistance. Stefano Scarpetta, Mark Pearson and Francesca Colombo provided senior leadership and advice throughout the project. Preliminary versions of the chapters of this report were presented and discussed at a meeting of the OECD Expert Group on the Economics of Public Health (EGEPH), and reviewed by the OECD Health Committee. Country experts and delegates are too many to name individually, but authors would like to thank in particular delegates from Australia, Austria, Ireland, Poland and the United States for their constructive comments throughout the process.

Within WHO/Europe, this project was led by the WHO European Office for the Prevention and Control of Noncommunicable Diseases. The authors would like to thank Joao Breda for his contribution to the conceptualisation of the project, Liza Villas, Anna Chaturvedi and Anastasia Shatokhina for administrative support, Adriana Pinedo for research support, Ding Ding and Romeu Mendes for technical advice, and Nino Berdzuli for senior leadership and guidance.

WHO/Europe would also like to express their gratitude to the European Commission Directorate-General for Education, Youth, Sport and Culture for their support. This document was produced with the financial assistance of the European Union. The views expressed herein can in no way be taken to reflect the official opinion of the European Union.

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Acronyms and abbreviations

BMI	Body mass index
COSI	WHO European Childhood Obesity Surveillance Initiative
DALYs	Disability adjusted life years
EU	European Union
EU27	The 27 European Union Member States
GPAQ	Global Physical Activity Questionnaire
HEPA	Health-enhancing physical activity, any form of physical activity that benefits health and functional capacity without undue harm or risk
LPA	Light-intensity physical activity, between 1.5 and less than 3 METs. This includes slow walking, bathing, or other incidental activities that do not result in a substantial increase in heart rate or breathing rate.
MET	Metabolic equivalent of task, a measure to reflect the intensity of physical activities, and allows comparison between them. One MET is the energy equivalent expended per unit of time by an individual while seated at rest. More intense activities, which cost more energy expenditure than being seated at rest, are attributed higher METs.
MET-minutes	A tool for tracking physical activity, calculated by the intensity of activity (in MET) multiplied by the duration of activity (in minutes)
MPA	Moderate-intensity physical activity, between 3 and less than 6 METs. This includes activities such as gardening, dancing or brisk walking.
NCDs	Non-communicable diseases
PA/BMI link	The OECD SPHeP-NCDs model includes a link between physical activity (PA) and BMI, to capture the effects of physical activity on weight
PAF	Population attributable fraction
PAP	Physical activity on prescription
PE	Physical education
PPP	Purchasing power parities are the rates of currency conversion that try to equalise the purchasing power of different currencies, by eliminating the differences in price levels between countries.
SPHeP-NCDs	Strategic Public Health Planning for Non-Communicable Diseases model
VPA	Vigorous-intensity physical activity, 6 or more METs. This includes activities such as fast swimming or running

Executive summary

Regular physical activity is one of the most important things people can do to improve their physical and mental health and well-being. It helps prevent a range of non-communicable diseases and improves mental health and cognitive functioning, among other benefits.

Nevertheless, the prevalence of insufficient physical activity remains high in the European Union.

- More than one in three adults do not meet the WHO physical activity guidelines, and almost half (45%) report that they never exercise or play sport.
- Less than one in five boys and one in ten girls meet the WHO recommended level of physical activity for adolescents.
- Women and older people are less likely to do regular sports or exercise, as well as people from lower socio-economic groups: only 24% of people who consider themselves working class exercises at least once a week, versus 51% of people who consider themselves upper class.
- The COVID-19 pandemic has worsened the situation, with many people reporting a decrease in physical activity due to restrictions and confinement.

More can be done to increase physical activity levels. Despite many countries having stepped up their efforts to promote physical activity, there remain gaps in the policy response.

Increasing population levels of physical activity can have multiple benefits. First, it would have a considerable impact on population health and health care expenditure. Second, policies to improve physical activity levels can support the COVID-19 recovery by creating a healthier, more resilient population, improving mental health and social connection, and supporting the sports and exercise industry. Furthermore, these policies can have positive impacts on the environment, by promoting active transport, reducing emissions, and increasing green space.

If everyone were to meet the WHO recommended level of 150 minutes of moderate-intensity physical activity per week, this could:

- Prevent more than 10 000 premature (people aged 30 to 70 years) deaths per year – similar to the number of deaths due to COVID-19 in that same age group in France and Germany combined in 2020.
- Increase life expectancy of people who are insufficiently active by 7.5 months, and of the total population by nearly 2 months.
- Save European Union Member States 0.6% of their health care budget on average, a total of nearly EUR PPP 8 billion per year – more than the total annual health care expenditure of Lithuania and Luxembourg combined.

A wide range of policy options exist to increase population physical activity, all of which improve population health, reduce health care expenditure, and have a positive impact on workforce size and productivity. However, as physical activity is a complex behaviour, a comprehensive package of policies is needed to target all its drivers at the same time. Investing in such a comprehensive package of physical activity policies is a good investment, delivering larger returns than implementing single policies in isolation.

1 Why physical activity?

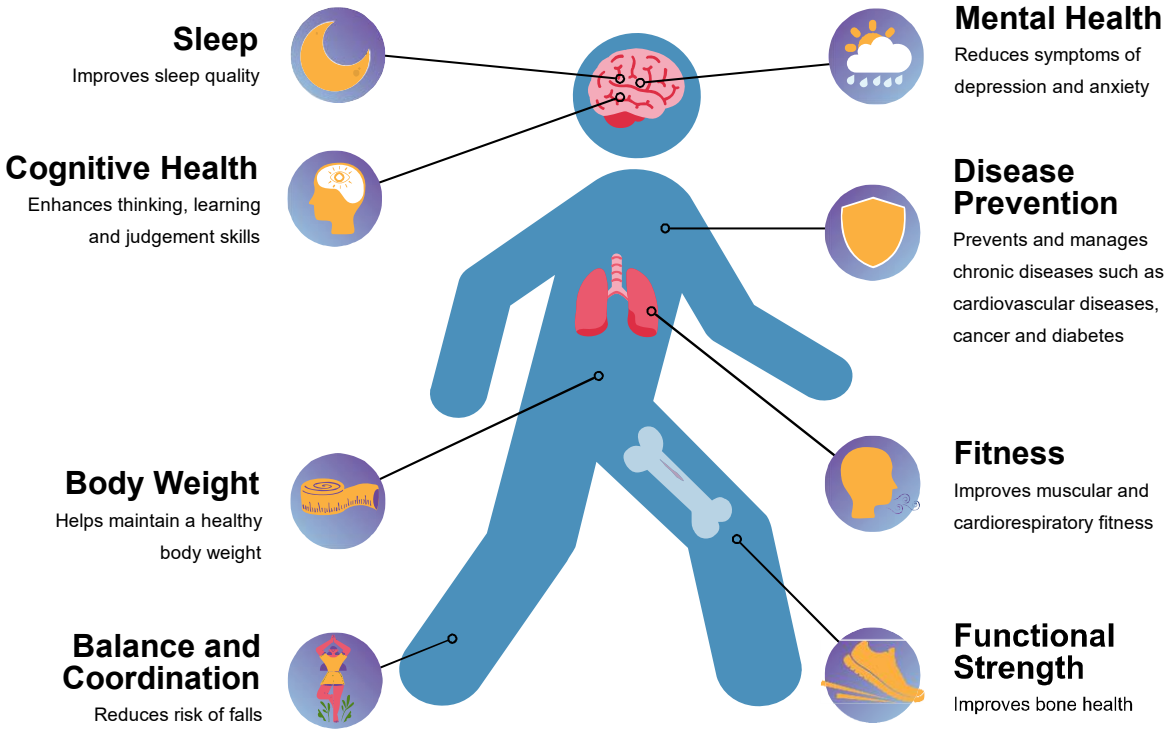
Regular physical activity has a wide range of health and well-being benefits. This chapter provides an overview of these benefits. It also outlines the frequency, intensity, type and duration of physical activity that is recommended for different population groups. Finally, it describes the current policy measures that are in place in the European Union to encourage physical activity in the population.

Key messages

- Regular physical activity is one of the most important things people can do to improve their physical and mental health and well-being, regardless of age, sex or ethnicity.
- Insufficient physical activity is a leading risk factor for non-communicable diseases such as cardiovascular diseases, type 2 diabetes, cancers, and has a negative effect on mental health and quality of life.
- A low amount of physical activity, a low level of fitness and sedentariness – although interlinked – all independently increase the risk of many chronic diseases.
- In 2020, the World Health Organization launched new physical activity guidelines, which recommend that adults should do at least 150 to 300 minutes of moderate-intensity physical activity per week, or 75 to 150 minutes of vigorous intensity physical activity.
- There are growing policy making efforts across the European Union aimed to increase population-level physical activity.

Infographic 1.1. The health benefits of physical activity

Physical activity has significant health benefits for bodies and minds



Physical activity has a wide range of benefits for physical and mental health

Regular physical activity is one of the most important things people can do to improve their physical and mental health and well-being. Moving more and sitting less have benefits for everyone, regardless of age, sex, race, ethnicity or current fitness level. Considering both the impact of the COVID-19 pandemic and the increasing burden of non-communicable diseases and mental health conditions, physical activity is now more important than ever.

Currently, the world is experiencing an extraordinary, life-altering challenge due to the COVID-19 pandemic. But while the pandemic is having devastating human and economic consequences, it should not make people lose sight of the impact of major risk factors on the burden of chronic diseases, which also bear an increasing toll on mortality. Comparing COVID-19 related deaths to other common causes of death during the first wave in seven of the most affected European countries shows that, while mortality from COVID-19 was high particularly in elderly people, it was outweighed by deaths from cancer as well as cardiovascular diseases in Italy, Germany, France, Portugal and the Netherlands (Olabi et al., 2021[1]). In Spain the proportion of deaths due to COVID-19 was similar to that due to cancer. Moreover, the COVID-19 mortality rate is now declining further as treatments improve and vaccination coverage increases.

Life expectancy now reaches 81 years in the European Union (EU) (OECD/European Union, 2020[2]; World Bank, 2019[3]). However, many years of life in old age are lived with chronic diseases and disabilities. The main cause of death is still non-communicable diseases (NCDs) across Europe. In the EU Member States cardiovascular diseases (over 1 700 000 deaths in 2017) and cancers (1 200 000 deaths) together account for over 60% of all deaths. Nearly 40% of people aged 65 years and over have at least two chronic conditions, although this does not necessarily impede them from leading a normal life. About 30% of people aged 65 years and over have at least one limitation in activities of daily living that may require some long-term care assistance (OECD/European Union, 2020[2]).

Good mental health is vital for people to be able to lead healthy and productive lives. In 2018, one in nine adults (11%) on average across EU Member States had symptoms of psychological distress (OECD/European Union, 2020[2]). Currently, the situation maybe even worse as the COVID-19 crisis is also having a negative impact on mental well-being, especially amongst young people and people with lower socio-economic status (Aknin et al., 2021[4]). Moreover, the population in the EU is older than the global population, suggesting that it might be particularly vulnerable to an increasing burden of age-related neurological disorders, such as stroke or Alzheimer disease, which ranked third after cardiovascular diseases and cancers – representing 13.3% of total disability adjusted life years (DALYs) and 19.5% of total deaths (Deuschl et al., 2020[5]).

Fortunately, the majority of the most common chronic diseases and mental disorders are favourably influenced by regular physical activity. Even a single session of moderate-to-vigorous physical activity can reduce blood pressure, improve insulin sensitivity, improve sleep, reduce anxiety symptoms, and improve some aspects of cognition (including attention and memory) on the day that it is performed (Department of Health and Human Services, 2018[6]). Most of these improvements become even larger with the regular performance of physical activity. Other benefits, such as disease risk reduction and improved physical function, occur within days to weeks after consistently being more physically active.

Evidence shows that regular physical activity reduces all-cause mortality, as well as the risk of coronary heart disease, high blood pressure, stroke, insulin resistance, type 2 diabetes, some types of cancers, depression, anxiety, neuro-degenerative diseases and falls. Other benefits include increased cardiorespiratory and muscular fitness (Box 1.1), enhanced immune system, healthier body mass and composition, improved bone health, increased functional health, improved cognitive function and better sleep (Lee et al., 2012[7]).

Box 1.1. Physical activity, fitness and sedentary behaviour

There are three independent risk factors that are linked to someone's activity habits and lifestyle. These are a low amount of physical activity, a low level of cardiovascular fitness (CVF) and sedentary behaviour. Although these factors are interlinked, they all independently increase the risk of chronic diseases.

Even if, at first, insufficient physical activity and sedentary behaviour sound very similar, they are conceptually different (van der Ploeg and Hillsdon, 2017[8]). Insufficient physical activity occurs when individuals are not meeting the requirements of current physical activity guidelines. In contrast, sedentary behaviour is any behaviour during waking hours characterised by a low energy expenditure while sitting, reclining or lying. Sedentary behaviour includes most desk-based office work, driving a car, TV-watching and playing inactive video games and it is often estimated by sitting time or screen time (WHO, 2020[9]; SBRN Terminology Consensus Project Participants, 2017[10]). Research on the health effects of sedentary behaviour is a relatively new area, but the potential population health impact of sedentariness is substantial (Biddle et al., 2016[11]).

CVF is a direct marker of physiologic status and reflects the overall capacity of the cardiovascular and respiratory systems, and the ability to carry out prolonged physical exercise. Recent data suggest that CVF has an important role in reducing not only cardiovascular and all-cause mortality, but also incident myocardial infarction, hypertension, diabetes, atrial fibrillation, heart failure, and stroke (Al-Mallah, Sakr and Al-Qunaibet, 2018[12]). Most recently, its role in cancer prevention has started to emerge. Moreover, high CVF during childhood and adolescence has been associated with a healthier cardiovascular profile during these years, as well as later in life (Ruiz et al., 2007[13]). The prognostic value of CVF has been demonstrated in various patient populations and in different cardiovascular conditions.

Physical inactivity, sedentary behaviour and low levels of fitness are all modifiable risk factors. Therefore, every individual should be encouraged to be physically active while limiting their time in sedentary activities to achieve optimal health benefits.

Physical activity is important for everyone at every stage of life. Just a few of the benefits for different population groups are (Department of Health and Human Services, 2018[6]):

- Healthy growth and development, improved bone health and weight status for children ages 3 through 5 years.
- Improved cognitive function, cardiorespiratory and muscle fitness, bone health and maintenance of healthy weight status for youth ages 6 to 13 years.
- Brain health benefits, including possible improved cognitive function, reduced anxiety, depression and cognitive impairment risk, and improved sleep and quality of life across the lifespan.
- For pregnant women, reduced risk of excessive weight gain, gestational diabetes, and postpartum depression.
- For older adults, reduced risk of fall-related injuries, preserving physical function and mobility, and delaying the onset of major disability.

Current evidence suggests that many of the health benefits of a physically active lifestyle during adolescents carry forward into adulthood (Department of Health and Human Services, 2018[6]). Individuals who remain active throughout childhood and adolescence significantly reduce the risk of developing obesity in young adulthood (Kwon et al., 2015[14]). Physical activity also functions as a protective mechanism for depressive symptoms across all ages (Department of Health and Human Services, 2018[6]).

The positive health outcomes resulting from physical activity demonstrate that it is a “best buy” in the prevention and management of NCDs, improving daily functioning, mental health and well-being (van der Ploeg and Bull, 2020[15]). Europe’s demographic changes (ageing workforce and population) and the ongoing and after effects from the COVID-19 pandemic are highlighting the urgency for all countries in the WHO European Region to increase investment in policy, research and community-based programs to promote and ensure physical activity opportunities for everyone.

Adults should do at least 150-300 minutes of moderate-intensity physical activity per week

Physical activity goes beyond sports and exercise, and is defined as any bodily movement resulting in an increase in energy expenditure. Physical activity is evaluated by applying the FITT principles: F = frequency, I = intensity, T = time and T = type. Frequency denotes how often a person is physically active, intensity measures how vigorous the physical activity is; and time is the total duration of the activity. The type of physical activity refers to whether the activity is aerobic or anaerobic (e.g. cycling or sprinting), or can be categorised into three domains (i.e. leisure-time, transportation, work/household-related activities) (Rhodes et al., 2017[16]). Fundamentally, being physically active can be done in many ways: walking, cycling, sports and active forms of recreation (i.e. dance, yoga, swimming), activities at work, household and domestic duties. All forms of physical activity provide health benefits. However, when physical activity is practiced regularly, with sufficient duration and intensity, the benefits are greater (Rhodes et al., 2017[16]).

In 2020, WHO released new guidelines on physical activity and sedentary behaviour (Box 1.2). The guidelines recommend at least 150-300 minutes of moderate-intensity aerobic physical activity; or at least 75-150 minutes of vigorous intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week for adults (including elderly, pregnant women and those with chronic medical conditions and/or disability all without contradictions) to achieve the above-mentioned benefits. For children and adolescents (5-17 years) the guidelines call for more activity.

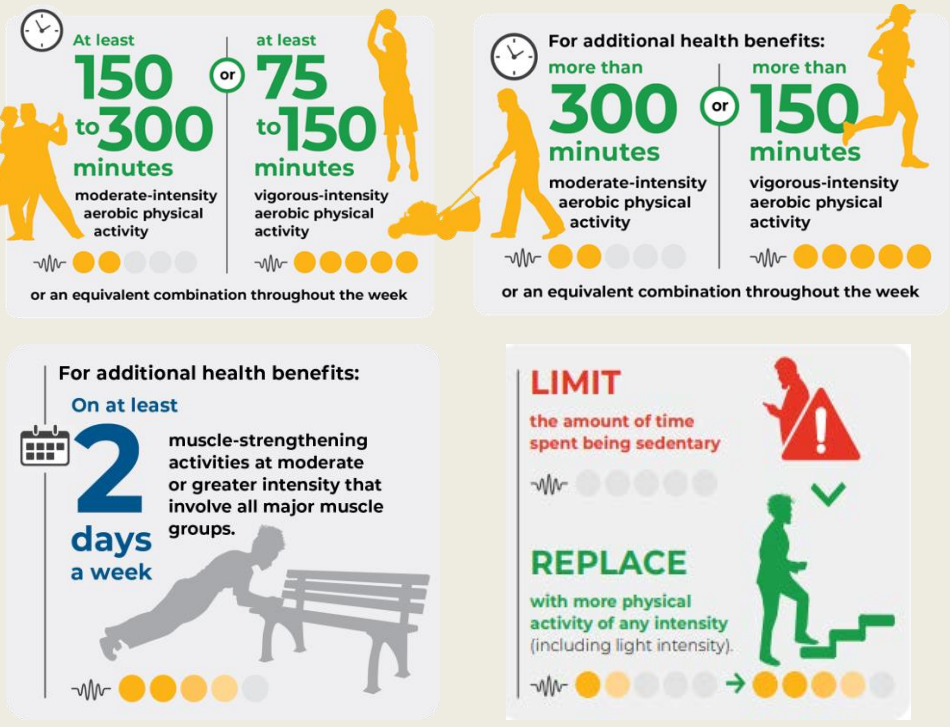
Box 1.2. WHO Guidelines on physical activity and sedentary behaviour

To help reduce the detrimental effects of insufficient physical activity on health, all individuals are encouraged to become active. In addition to the physical activity recommendations below (Infographics 1.2 to 1.5), it is recommended for all individuals to limit the amount of time spent being sedentary. The guidelines also provide specific recommendations for individuals with chronic medical conditions and/or disability, and pregnant and postpartum women (see 0 for more detailed guidelines).

Infographic 1.2. Physical activity recommendations for children under the age of 5 years

Infographic 1.3. Physical activity recommendations for children and adolescents 5-17 years of age

Infographic 1.4. Physical activity recommendations for adults 18-64 years of age



Infographic 1.5. Physical activity recommendations for adults 65 years and older

Source: WHO (2020[9]), WHO guidelines on physical activity and sedentary behaviour, https://www.who.int/publications/i/item/9789240015128; WHO (WHO, 2019[17]), Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age, https://apps.who.int/iris/bitstream/handle/10665/311664/9789241550536-eng.pdf?sequence=1&isAllowed=y

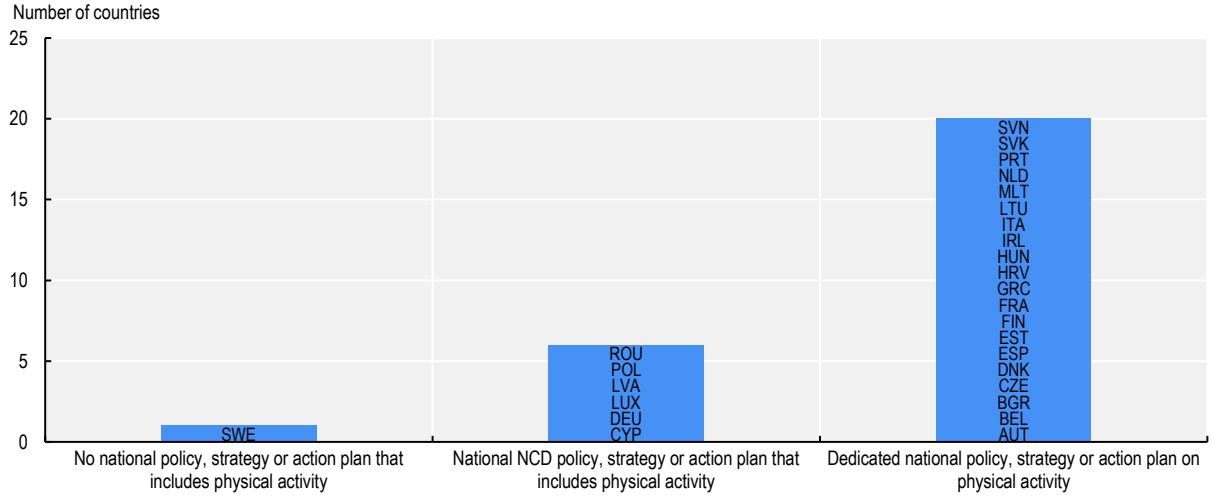
A variety of policies and plans on physical activity have been adopted in recent years

The majority of physical activity policy documents launched before 2010 dealt either with health-related behaviours in general or with nutrition and physical activity combined (Gelius et al., 2021[18]). Due to increasingly conclusive evidence regarding physical activity as a significant health determinant, there are growing policy making efforts aimed specifically to increase population-level physical activity, both at national and at international level.

In 2013, ministers of health and representatives of the Member States of WHO European Region adopted the *Vienna Declaration on Nutrition and NCDs in the context of Health 2020*. The declaration called for the

development of an independent strategy to promote physical activity in the WHO European Region (WHO, 2013[19]). Since then WHO Europe and the European Commission have released regional strategies to promote and support policies to tackle physical inactivity and sedentary behaviours. Many members of the WHO European Region have established national physical activity policies in recent years to address the problem of physical inactivity (Figure 1.1). However, there remain challenges and opportunities to develop and improve the design and implementation of these policies, before the current physical inactivity trends and negative effects are reversed (WHO, 2021[20]).

Figure 1.1. Countries with national policies, strategies or action plans on physical activity in 2019



Source: WHO (2019[21]), NCD Country Capacity Survey, https://www.who.int/teams/ncds/surveillance/monitoring-capacity/ncdccs.

Also in 2013, Member States in the EU have adopted policies in line with the EU Council Recommendation on promoting health-enhancing physical activity (HEPA) across sectors (Council of the European Union, 2013[22]). The EU council recommendations include 23 indicators to measure progress on physical activity. The following year the Commission established a network of physical activity focal points to monitor the implementation of HEPA policies in the Member States, based on the EU Physical Activity Guidelines and the EU Council Recommendation (Whiting et al., 2021[23]). This was reinforced by the WHO Physical Activity Strategy for the WHO European Region 2016-25, which provided a blueprint to incentivise Member States to act (WHO, 2016[24]; Breda et al., 2018[25]). The European Commission in partnership with WHO Europe has published EU Member States factsheets on physical activity, which also provide an indication of the policy gaps that require more action at the national level (WHO, 2018[26]).

The WHO's Global Action Plan on Physical Activity (GAPPA) 2018-30 was launched in 2018. The aim is to assist countries in developing policy actions to promote physical activity and to reduce physical inactivity by 10% by 2025, and 15% by 2030. This plan provides an evidence-based framework with four strategic objectives (active societies, active environment, active people and active systems) and 20 recommended policy actions and interventions (WHO, 2018[27]). Countries are encouraged to implement the GAPPA recommendations together with the ACTIVE technical package. This comprises a set of specific policy actions for governments at the national, sub-national and local level to promote physical activity throughout life and through multiple settings.

Finally, the two-year campaign HealthyLifestyle4All (HL4A) (EC, 2021[28]), which is a follow-up of the Tartu Call for a Healthy Lifestyle, was launched in September 2021 to showcase the European Commission's continuous commitment to promoting a healthy lifestyle across generations and social groups.

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Annex 1.A. WHO Guidelines on physical activity and sedentary behaviour

Infants under 1 year of age

Infants under 1 year of age should be physically active several times a day in a variety of ways, particularly through interactive floor-based play; more is better. For those not yet mobile, this includes at least 30 minutes in prone position (tummy time) spread throughout the day while awake. They should not be restrained for more than 1 hour at a time (e.g. prams/ strollers, high chairs, or strapped on a caregiver's back). Screen time is not recommended. When sedentary, engaging in reading and storytelling with a caregiver is encouraged. They should have 14-17 hours (0-3 months of age) or 12-16 hours (4-11 months of age) of good quality sleep, including naps (WHO, 2019[17]).

Children 1 and 2 years of age

Children 1 and 2 years of age should spend at least 180 minutes in a variety of types of physical activities at any intensity, including moderate to vigorous-intensity physical activity, spread throughout the day; more is better. They should not be restrained for more than 1 hour at a time (e.g. prams/ strollers) or sit for extended periods of time. Sedentary screen time should be no more than 1 hour a day; less is better. When sedentary, engaging in reading and storytelling with a caregiver is encouraged. For 1-year-olds, sedentary screen time (such as watching TV or videos, playing computer games) is not recommended. For those aged 2 years, sedentary screen time should be no more than 1 hour a day; less is better. When sedentary, engaging in reading and storytelling with a caregiver is encouraged. They should have 11-14 hours of good quality sleep, including naps, with regular sleep and wake-up times (WHO, 2019[17]).

Children 3 and 4 years of age

Children 3 and 4 years of age should spend at least 180 minutes in a variety of types of physical activities at any intensity, of which at least 60 minutes is moderate- to vigorous intensity physical activity, spread throughout the day; more is better. They should not be restrained for more than 1 hour at a time (e.g. prams/ strollers) or sit for extended periods of time. Sedentary screen time should be no more than 1 hour a day; less is better. When sedentary, engaging in reading and storytelling with a caregiver is encouraged. They should have 10-13 hours of good quality sleep, which may include a nap, with regular sleep and wake-up times (WHO, 2019[17]).

Children and adolescents 5-17 years of age

Children and adolescents should do at least an average of 60 minutes per day of moderate- to vigorous-intensity, mostly aerobic, physical activity, across the week. Vigorous-intensity aerobic activities, as well as those that strengthen muscle and bone, should be incorporated at least 3 days a week. Children and adolescents should limit the amount of time spent being sedentary, particularly the amount of recreational screen time (WHO, 2020[9]).

Adults 18-64 years of age

All adults should undertake regular physical activity. Adults should do at least 150-300 minutes of moderate-intensity aerobic physical activity; or at least 75-150 minutes of vigorous intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week, for substantial health benefits. Adults should also do muscle strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week, as these provide additional health benefits. Adults should limit the amount of time spent being sedentary. Replacing sedentary time with physical activity of any intensity (including light intensity) provides health benefits. To help reduce the detrimental effects of high levels of sedentary behaviour on health, adults should aim to do more than the recommended levels of moderate- to vigorous-intensity physical activity (WHO, 2020[9]).

Adults 65 years and older

All older adults should undertake regular physical activity. Older adults should do at least 150– 300 minutes of moderate-intensity aerobic physical activity; or at least 75-150 minutes of vigorous intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity during the week, for major health benefits. For additional health benefits older adults should do muscle strengthening activities at moderate or greater intensity that involve all major muscle groups on two or more days a week. They may also increase moderate intensity aerobic physical activity to more than 300 minutes; or do more than 150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous intensity activity, during the week. As part of their weekly physical activity, to enhance functional capacity and to prevent falls, older adults should do varied multicomponent physical activity that emphasises functional balance and strength training at moderate or greater intensity, on 3 or more days a week. Older adults should also limit the amount of time spent being sedentary (WHO, 2020[9]).

Pregnant and postpartum women

It is recommended that all pregnant and postpartum women without contraindication should engage in regular physical activity throughout pregnancy and postpartum. Women should do at least 150 minutes of moderate intensity aerobic physical activity during the week for major health benefits. For additional health benefits include a variety of aerobic and muscle strengthening activities and gentle stretching. In addition, women who before pregnancy engaged regularly in vigorous intensity aerobic activity, or who were physically active, can continue these activities during pregnancy and the postpartum period. Pregnant and postpartum women should limit the amount of time spent being sedentary (WHO, 2020[9]).

Adults and older adults with chronic conditions (aged 18 years and older)

Adults and older adults with chronic conditions (cancer, hypertension, type 2 diabetes and HIV) should do at least 150-300 minutes of moderate-intensity aerobic physical activity; or at least 75-150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous intensity activity throughout the week, for substantial health benefits. For additional health benefits, they should also do muscle-strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week. To enhance functional capacity and to prevent falls, they should do varied multicomponent physical activity that emphasises functional balance and strength training at moderate or greater intensity, on 3 or more days a week.

When not contraindicated, adults and older adults with these chronic conditions may increase moderate intensity aerobic physical activity to more than 300 minutes; or do more than 150 minutes of vigorous-

intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous intensity activity throughout the week for additional health benefits (WHO, 2020[9]).

Children and adolescents (aged 5-17 years) living with disability

This age group living with disability should do at least an average of 60 minutes per day of moderate- to vigorous intensity, mostly aerobic, physical activity, during the week, including at least 3 sessions per week of vigorous-intensity aerobic activities, as well as those that strengthen muscle and bone (WHO, 2020[9]).

Adults (aged 18 years and older) living with disability

Adults living with disability should do at least 150-300 minutes of moderate-intensity aerobic physical activity; or at least 75-150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity, during the week, for major health benefits. For additional health benefits, adults living with disability should also do muscle-strengthening activities at moderate or greater intensity that involve all major muscle groups, on 2 or more days a week. They may increase moderate-intensity aerobic physical activity to more than 300 minutes; or do more than 150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week. To enhance functional capacity and to prevent falls, older adults should do varied multicomponent physical activity that emphasises functional balance and strength training at moderate or greater intensity, on 3 or more days a week (WHO, 2020[9]).

2 Physical activity in Europe: Trends and patterns

Despite the health and well-being benefits of physical activity, many people in the European Union do not move enough. This chapter provides an overview of physical activity levels in Europe, and explores patterns and trends, such as differences across age, gender and socio-economic groups. It also looks at the impact that the COVID-19 pandemic has had on physical activity.

Key messages

- The prevalence of insufficient physical activity was already high before the COVID-19 pandemic: more than one in three adults did not meet the WHO physical activity guidelines, and almost half (45%) reported that they never exercise or play sport.
- Physical inactivity is also prevalent in adolescents, with less than one in five (17.6%) boys and one in ten (9.6%) girls across 27 EU Member States reporting to meet their WHO recommendation in 2018.
- Women and older people are less likely to do regular sports or exercise: among 15 to 24-year-olds, 73% of men participate at least weekly in sports or exercise, compared to 58% of women.
- People from lower socio-economic groups are less likely to exercise regularly (only 24% of people who consider themselves working class exercises regularly, versus 51% of upper-class people), but occupational physical activity is less common in higher socio-economic groups.
- Drivers of physical inactivity include urbanisation and economic development, environments that prioritise motorised travel, and a decrease in occupational and household physical activity.
- The COVID-19 pandemic further worsened the situation, with more than half of adults reporting a reduction in their frequency of physical activity.

More than one in three European adults does not do enough physical activity

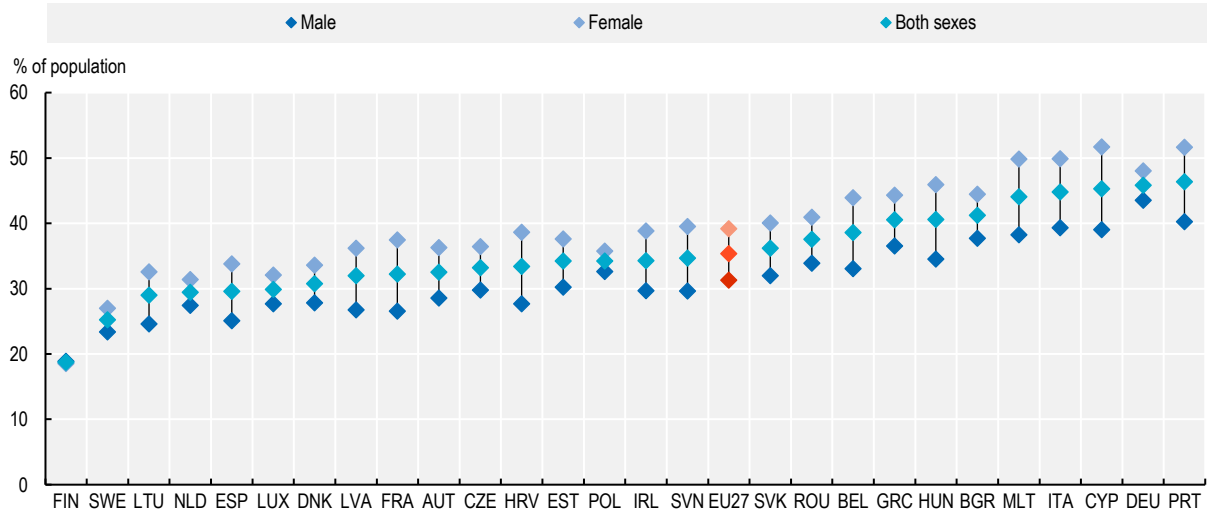
Despite the well-established benefits of leading a physically active lifestyle and the broader public health impact of reducing chronic disease risk and premature mortality, too many adults and children are insufficiently physically active across Europe. While different measurement approaches result in different estimates of the prevalence of insufficient physical activity (Box 2.1), most confirm that it is common.

The WHO combines and adjusts data on insufficient physical activity from different sources, to provide global estimates of the prevalence of insufficient physical activity. Based on this data, more than one in three (35.4%) adults in the 27 EU Member States were insufficiently active in 2016 (Figure 2.1). Insufficient physical activity was particularly prevalent in some Southern-European countries, while less frequent in Nordic countries.

This corresponds with the results of a large-scale study from 2012, which used the Global Physical Activity Questionnaire (GPAQ), and found that around one in three (34.8%) of European adults (aged 15 years or older) are insufficiently active (defined as less than 600 MET-minutes of physical activity per week, the WHO minimum recommendation) (Hallal et al., 2012[1]). Also using the same GPAQ questionnaire, the national prevalence of insufficient physical activity (less than 600 MET-minutes of physical activity per week) was estimated to range from 10.1% to 43.6% in nine Eastern European and Central Asian countries (Armenia, Azerbaijan, Belarus, Georgia, Kyrgyzstan, Republic of Moldova, Tajikistan, Türkiye and Uzbekistan) between 2013 and 2017 (Whiting et al., 2021[2]).

Figure 2.1. Prevalence of insufficient physical activity

Prevalence of insufficient physical activity (less than 150 minutes of moderate-intensity physical activity per week, or equivalent) among adults aged 18+ years, crude estimate (%), 2016



Source: WHO (2021[3]), Prevalence of insufficient physical activity among adults aged 18+ years (crude estimate) (%), https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-insufficient-physical-activity-among-adults-aged-18-years-(crude-estimate)-(-).

Box 2.1. Measuring physical activity in Europe

To establish accurate prevalence data and to monitor changes and trends in physical activity, valid, reliable and regular measures are required (Van Hecke et al., 2016[4]). Physical activity can be measured either objectively or subjectively. Traditionally, physical activity is assessed by means of self-reported questionnaires. Across Europe, different questionnaires are used.

Global Physical Activity Questionnaire (GPAQ)

The GPAQ was developed by WHO for physical activity surveillance in countries. It collects information on physical activity participation in three domains as well as on sedentary behaviour, using 16 questions. The domains are: (1) activity at work, (2) travel to and from places, and (3) recreational activities (WHO, n.d.[5]). The GPAQ is also part of the WHO STEPwise approach to NCD risk factor surveillance (STEPS) survey, often used in Eastern European and Central Asian countries (WHO, n.d.[6]).

Eurobarometer questionnaire

The Special Eurobarometer survey on sport and physical activity has been conducted in the EU Member States since 2002 (European Commission, 2022[7]). The Eurobarometer questionnaire comprises six items that ask about physical activity via the number of days of vigorous activity, moderate activity (excluding walking), and walking for at least 10 minutes in the last 7 days and the respective daily duration in order to assess the levels of physical activity according to the WHO's recommendations. It also asks about the frequency of exercising or playing sports, and of other physical activity such as cycling or gardening.

Single-item measure (SIM)

The SIM uses a past-week recall period asking about the number of days with at least 30 minutes of physical activity with an intensity that raises the breathing rate, including sport, exercise, walking, and cycling for recreation, but excluding household and work-related physical activity (Milton, Bull and Bauman, 2010[8]).

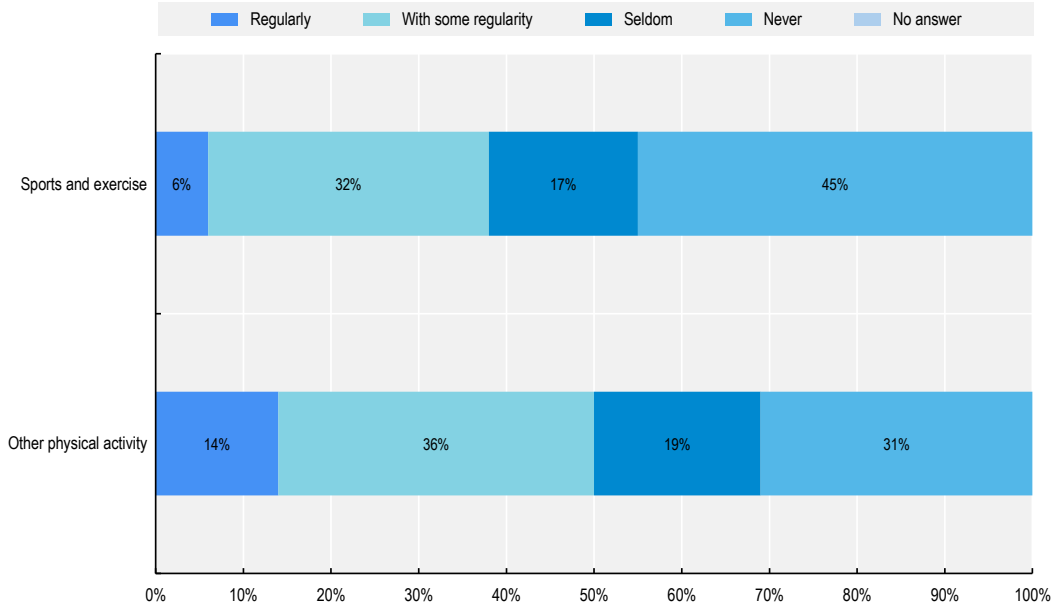
The choice of the measuring instrument largely affects survey outputs, and using the Eurobarometer questionnaire can result in more favourable PA prevalence data compared to using other instruments (Stassen et al., 2021[9]). For example, estimating the prevalence of achieving the recommended physical activity levels by a single-item measure or by the Eurobarometer questionnaire led to almost a three times difference within the same sample (SIM 31.3% vs. Eurobarometer 87.5%).

At national level, data on physical activity are provided by national surveys that differ in the applied methodology and definitions of "physically active". Therefore, between-countries comparison is difficult. Most of these national surveys are based on questionnaires, but in some cases more objective assessment methods (e.g. pedometers or accelerometers) are also being used. Data on physical activity levels from national sources is available in the **HEPA country factsheets** which are regularly published on the WHO website (WHO, 2021[10]).

Data from the latest Eurobarometer survey reported that, in 2022, four in ten (38%) adults in the EU exercise or play sport at least once a week, including 6% who do so at least five times per week (Figure 2.2) (European Commission, 2022[7]). Almost half of the respondents (45%) claimed that they never exercise or play sport. In addition, half of respondents (50%) reported to do other physical activities, such as cycling, dancing or gardening, at least once a week, while 31% never do this kind of activity at all.

Figure 2.2. Physical activity in the European Union

Proportion of adults who reported doing sport and exercise, or other physical activity, regularly, with some regularity, seldom and never, weighted average for EU27, 2022



Note: Questions asked were: "How often do you exercise or play sport?" and "How often do you engage in other physical activity such as cycling from one place to another, dancing, gardening, etc.?"; regularly: at least 5 times a week; with some regularity: at least once a week; seldom: less than once a week.
Source: European Commission, (2022[7]), Special Eurobarometer SP525: Sport and physical activity, https://europa.eu/eurobarometer/surveys/detail/2668.

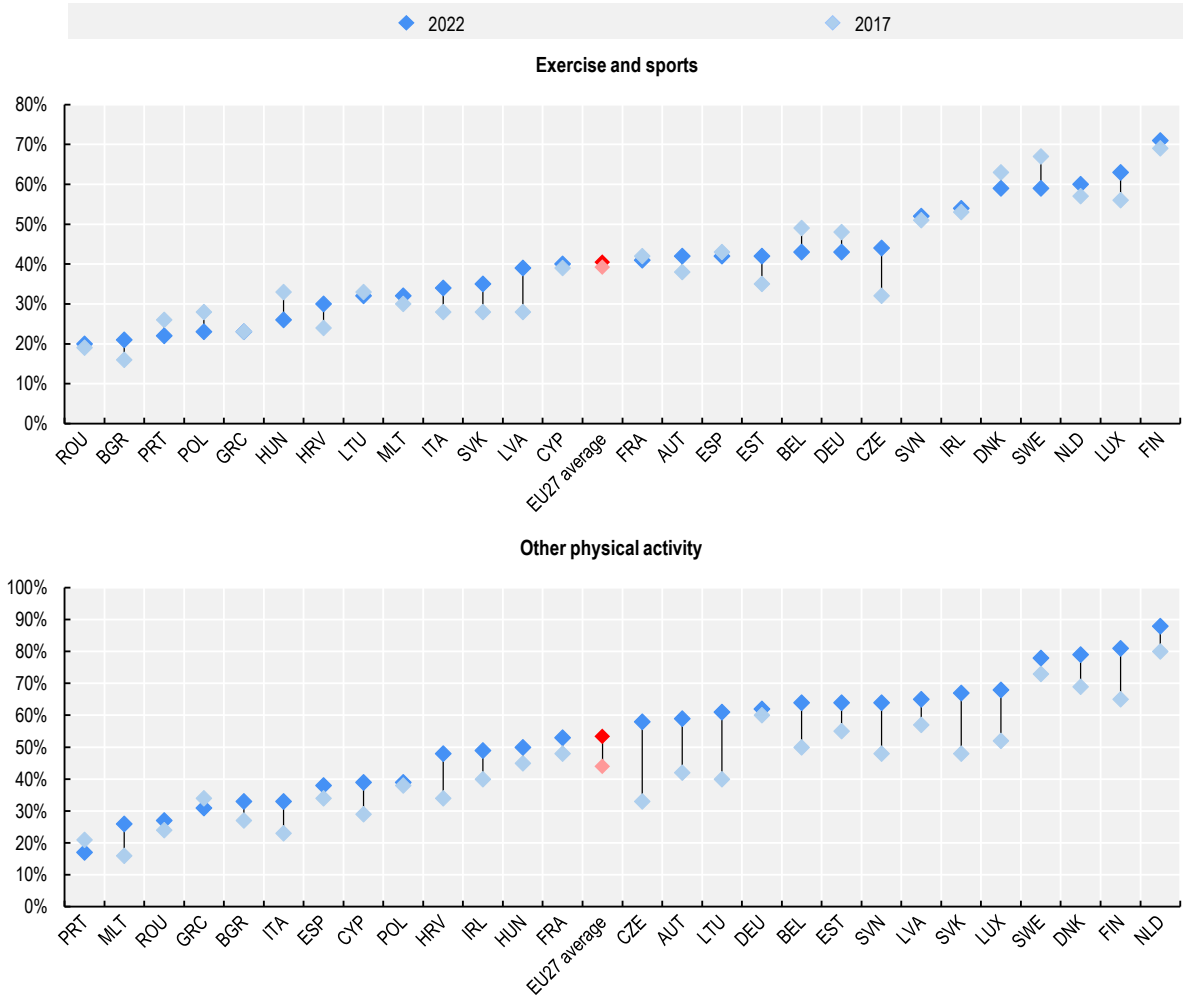
Only four in ten adults exercise regularly, with low rates in women, the elderly and lower socio-economic groups

On average, four in ten adults in the EU exercise regularly, but there is considerable variation across countries. While in Finland more than two-thirds of adults does sport or exercise weekly, in other countries this is one in five (Figure 2.3). Nordic countries also see higher rates of participation in other forms of physical activity, like cycling or gardening. Generally, countries with high participation in sport and exercise also see high participation in other forms of physical activity. Notable exceptions are the Slovak Republic and Latvia, which have below average levels of sport and exercise but higher participation in other forms of physical activity, while in Ireland the opposite is true.

While participation in sports and exercise changed little between 2017 and 2022 on average in the EU, weekly participation in other forms of physical activity increased – with the EU average going from 44% to 53% (Figure 2.3). Some countries saw considerable increases in the amount of physical activity practiced by adults. In the Czech Republic, the percentage of people practicing sports weekly increased by 12 percentage points while other physical activity increased by 25 percentage points. In Austria, Lithuania, Slovenia, Slovak Republic, Luxembourg and Finland participation in other forms of physical activity also increased considerably. Portugal on the other hand saw participation in both forms of physical activity decrease, while participation in sports and exercise decreased notably in Poland, Hungary, Belgium, Germany, Denmark and Sweden.

Figure 2.3. Physical activity trends in adults

Proportion of adults who reported doing sport and exercise, or other physical activity, at least once a week, in 2017 and 2022

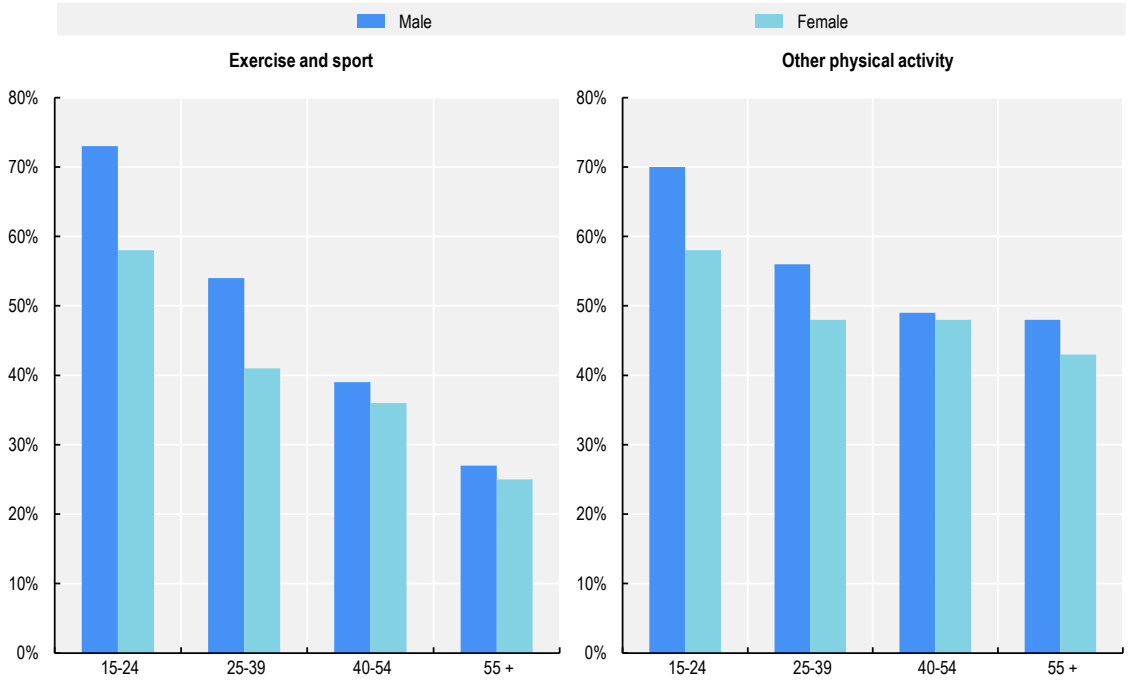


Note: Questions asked were: "How often do you exercise or play sport?" and "How often do you engage in other physical activity such as cycling from one place to another, dancing, gardening, etc.?"; EU27 average is not weighted.
Source: European Commission, (2022[7]), Special Eurobarometer SP525: Sport and physical activity, https://europa.eu/eurobarometer/surveys/detail/2668.

Physical activity becomes less frequent with age, as only one in four adults in the EU above the age of 55 years participates in sport or exercise at least once a week (Figure 2.4). Across all age groups, fewer women than men participate in sport and exercise. Especially in the youngest age group of 15 to 24-year-olds, the difference between sexes is large: 73% of men participate at least weekly in sport or exercise, compared to 58% of women. While for other forms of physical activity the difference between age groups and sexes is less pronounced, young men remain the most active.

Figure 2.4 Physical activity by age and sex

Proportion of adults who reported doing sport and exercise, or other physical activity, at least once a week, weighted average for EU27, 2022

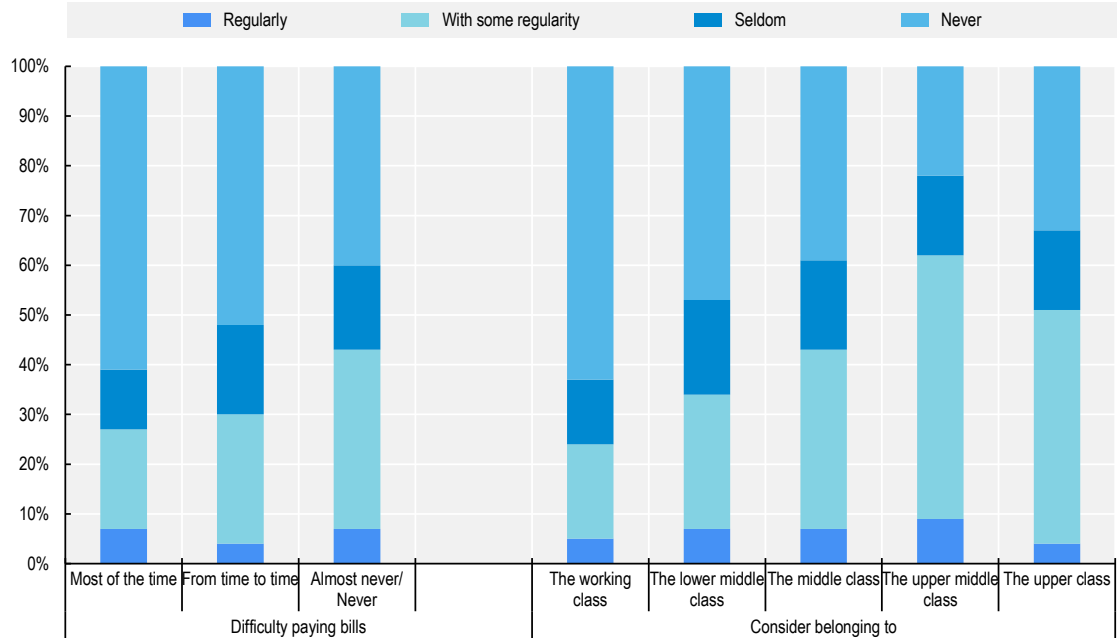


Note: Questions asked were: "How often do you exercise or play sport?" and "How often do you engage in other physical activity such as cycling from one place to another, dancing, gardening, etc.?"
Source: European Commission, (2022[7]), Special Eurobarometer SP525: Sport and physical activity, https://europa.eu/eurobarometer/surveys/detail/2668.

Looking at Eurobarometer data for EU Member States, there is a clear socio-economic gradient. Adults who almost never have difficulty paying bills engage in sport and exercise more frequently than adults who often have difficulties paying (Figure 2.5). Similarly, only 24% of people who consider themselves working class exercise at least once a week, versus 51% of people who consider themselves upper class. However, the pattern is different when considering other types of physical activity. People with a high socio-economic status tend to be more physically active during leisure-time compared to those with low socio-economic position, while occupational physical activity is more prevalent among the lower socio-economic groups (Beenackers et al., 2012[11]; Stalsberg and Pedersen, 2018[12]).

Figure 2.5. Sport or exercise in adults by socio-economic group

Proportion of adults who reported doing sport and exercise regularly, with some regularity, seldom and never, by socio-economic group, weighted average for EU27, 2022



Note: Questions asked were: "How often do you exercise or play sport?"; regularly: at least 5 times a week; with some regularity: at least once a week; seldom: less than once a week.
Source: European Commission, (2022[7]), Special Eurobarometer SP525: Sport and physical activity, https://europa.eu/eurobarometer/surveys/detail/2668.

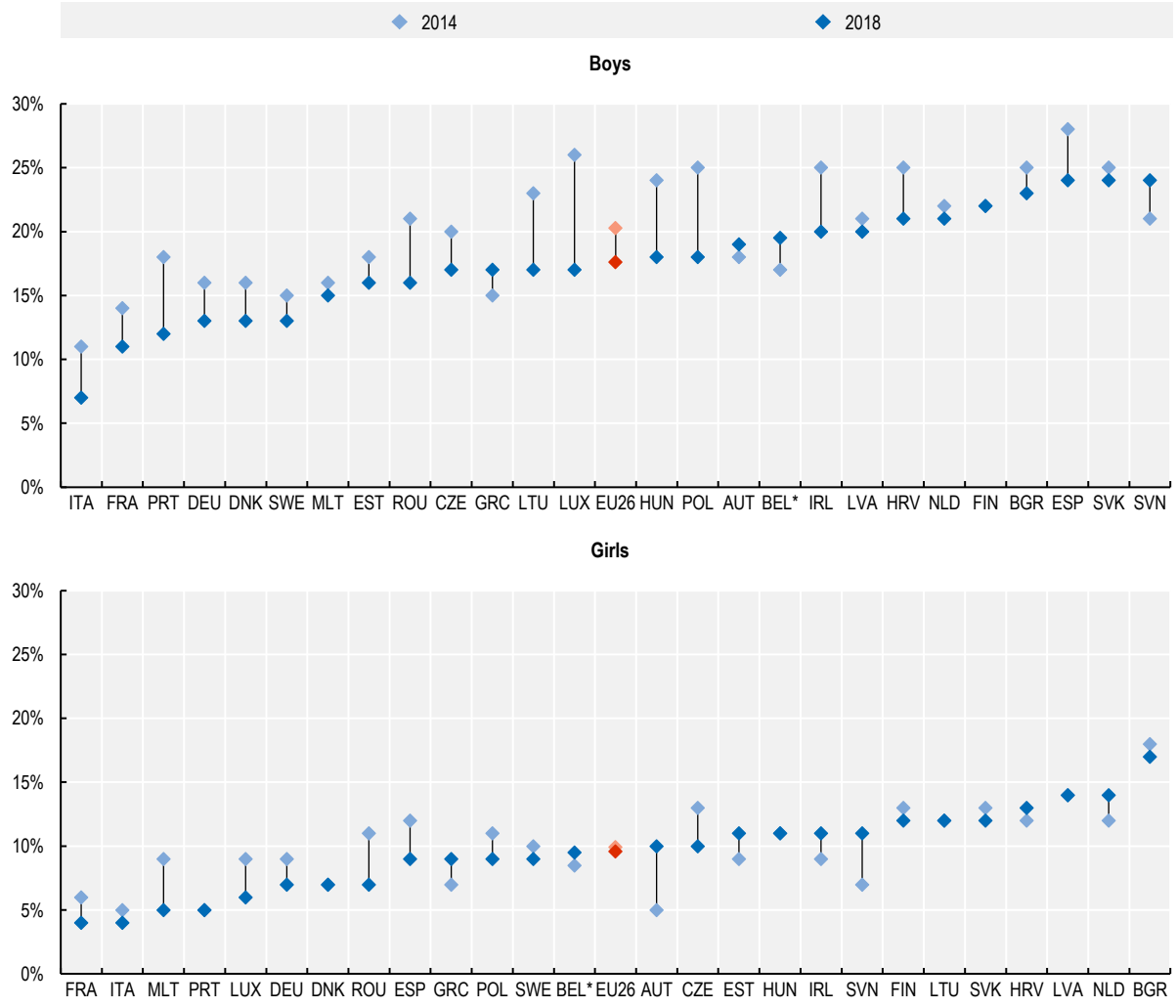
Few adolescents meet WHO recommended physical activity levels

Low physical activity is also common among adolescents, particularly among girls: across 26 EU Member States only 17.6% of boys and 9.6% of girls reported meeting the WHO recommendation of at least one hour of moderate to vigorous physical activity daily in 2018 (Figure 2.6). Italy, France and Portugal report some of the lowest levels of physical activity among adolescents, while it is relatively high in the Slovak Republic, Slovenia, the Netherlands and Bulgaria. In Spain, boys do better compared to the EU average than girls, and vice versa in Estonia and Lithuania.

Between 2014 and 2018 there was a decrease in physical activity levels for boys: the proportion of boys engaging in at least one hour of moderate to vigorous physical activity per day decreased from 20.3% to 17.6% (Figure 2.6). The largest change was in Luxembourg (from 26% to 17%) and Poland (25% to 18%). While there was no large change for girls, their level of physical activity was already much lower – at 9.6% in 2018. In some countries physical activity in girls decreased (both Malta and Romania saw a 4 percentage point decrease), while in others it increased (most notably in Austria and Slovenia, where there was a 5 and 4 percentage point increase, respectively).

Figure 2.6. Physical activity trends in adolescents

Proportion of 15-year-olds who report at least one hour of moderate to vigorous physical activity daily, in 2014 and 2018



Note: * unweighted average of Wallonia and Flanders.
Source: WHO (2020[13]), Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada. https://apps.who.int/iris/handle/10665/332104.

As in adults, physical activity rates in children and adolescents decline with age: while on average 24% of children aged 11 reported at least one hour of moderate to vigorous physical activity daily, this decreased to 19% at age 13, and 15% at age 15 (WHO, 2020[13]). Younger children are even more active: a recently published study that involved more than 150 000 children aged 6-9 years from 25 European countries using data from the WHO European Childhood Obesity Surveillance Initiative (COSI) in 2015-17 found that 79% were actively playing for more than one hour each day, 46% were members of a sport or dancing club, 50% walked or cycled to school each day, 60% engaged in screen time for less than two hours per day, and 85% slept for 9-11 per night as recommended (Whiting et al., 2020[14]).

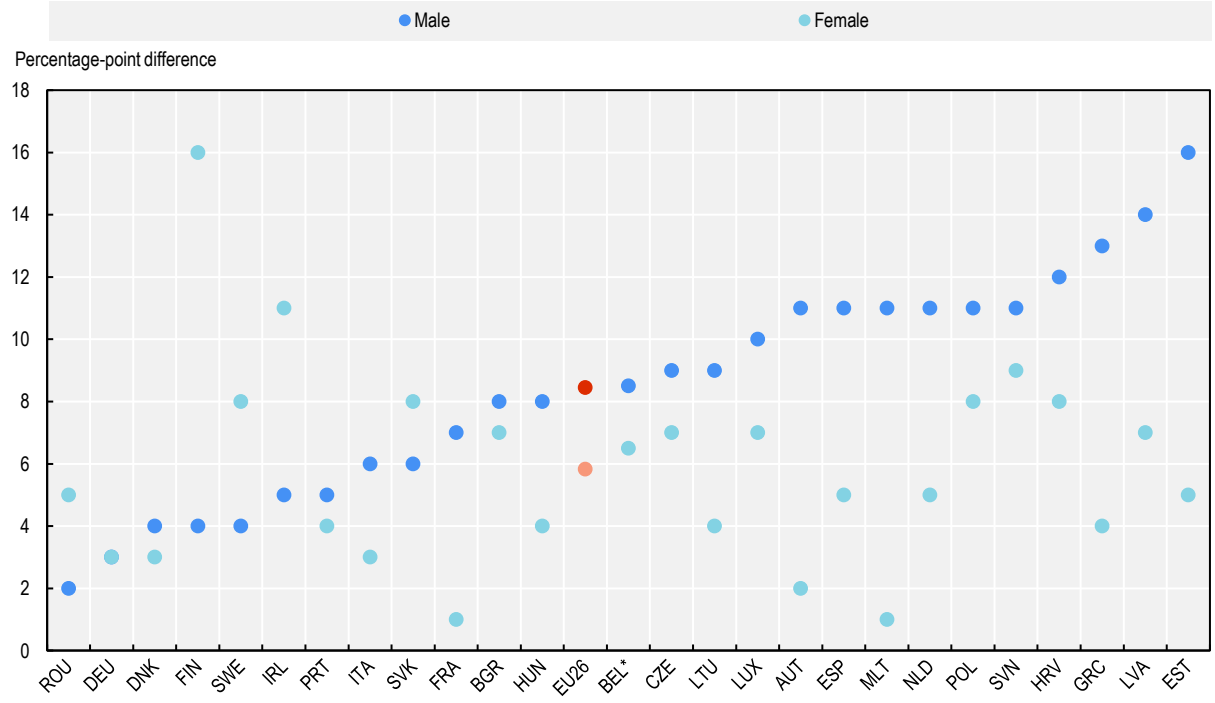
In many countries there is a socio-economic gradient, where higher affluence is associated with higher levels of physical activity in adolescents (Figure 2.7) (WHO, 2020[13]). This gradient is larger for boys than for girls in most countries, and on average in 26 EU Member States, the proportion of boys from highly affluent families who meet the physical activity guidelines is 8 percentage points higher than boys from

less affluent families. Physical activity among girls from affluent families is on average 6 percentage points higher than among girls from less affluent families.

However, the socio-economic gradient for adolescents needs to be interpreted with caution. A systematic review on social patterning of physical activity in adolescents found that while on a whole the results showed that adolescents with higher socio-economic status are more physically active than those with lower socio-economic status, the findings were far from uniform across studies, and a large number found no or the opposite effect (Stalsberg and Pedersen, 2010[15]).

Figure 2.7. Physical activity in children and adolescents by socio-economic group

Percentage point difference in prevalence of reporting at least one hour of moderate to vigorous physical activity daily between low and high family affluence groups, for children and adolescents aged 11, 13, and 15, in 2018



Note: * unweighted average of Wallonia and Flanders; a value of 5 means that the proportion of children from affluent families who are physically active (e.g. 25%) is 5 percentage points higher than the proportion of children from low affluence families (e.g. 20%).
Source: WHO (2020[13]), Findings from the 2017/2018 Health Behaviour in School-aged Children (HBSC) survey in Europe and Canada. https://apps.who.int/iris/handle/10665/332104.

Insufficient physical activity is driven by economic development, urbanisation, environmental and occupational factors

Similar to obesity, insufficient physical activity is related to rapid economic development (Kohl et al., 2012[16]). This is particularly evident and of concern in low- and middle-income countries, where occupational, domestic, and transport-related physical activities contribute more to overall energy expenditure than leisure time or recreational activities. Increasing urbanisation and rapid economic development have been linked to reductions in domestic and occupational physical activity in adults, as well as increased television viewing in children (Kohl et al., 2012[16]; Ng and Popkin, 2012[17]; Dearth-Wesley, Popkin and Ng, 2014[18]).

Evidence is mounting to suggest a causal relationship between the built environment and people's physical activity behaviours, particularly active transport (e.g. biking, walking). People living in more "walkable" environments that are safe and attractive are more prone to active transport and have higher levels of physical activity (Mackett and Brown, 2011[19]). Opting for a compact urbanisation that prioritises the needs of pedestrians is much better for promoting physical activity than environments that prioritise motor vehicles. Choosing active transportation is not only a personal decision. How cities are designed and the efficiency of their transport network are key in favouring or hampering active transport, and thereby, the levels of physical activity.

Currently, occupational physical activity is still the largest contributor of adults' weekly physical activity (Ng and Popkin, 2012[17]). However, different types of jobs result in different degrees of activity, and some occupations such as office jobs are associated with a significant amount of sitting time. These types of jobs have increased considerably over the last decades: while in the early 1960s almost half of private industry occupations in the United States required at least moderate intensity physical activity, now less than one in five demand this level of activity (Church et al., 2011[20]). It is estimated that in France less than one in four men (22.9%) and less than one in eight women (11.9%) occupied moderate or vigorous intensity jobs in 2009 (Graf and Cecchini, 2019[21]).

It is important to note that some evidence suggests that work-related physical activity may not have the same mental health benefits as leisure-time physical activity. One systematic review found that while leisure-time physical activity and transport physical activity both had a positive association with good mental health, work-related physical activity was negatively associated with mental health (White et al., 2017[22]). However, another European study found that doing any level of physical activity in any domain was associated with a lower prevalence of moderate, moderate-severe, and severe depressive symptoms (Cocker et al., 2021[23]).

Physical activity decreased during the COVID-19 pandemic

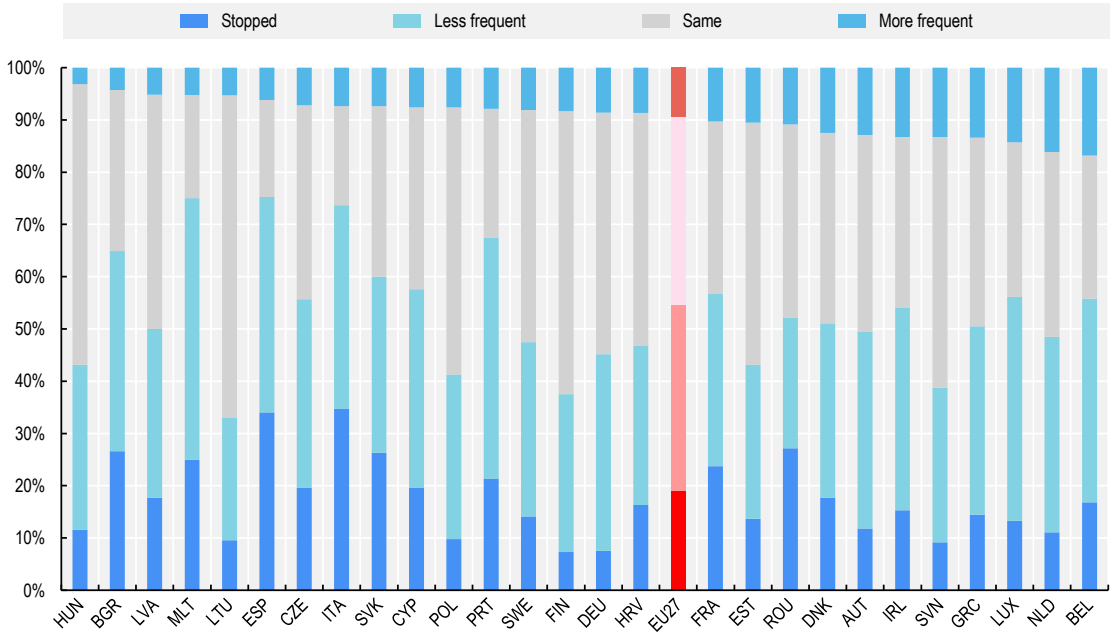
In March 2020, the world started experiencing an extraordinary change due to the COVID-19 pandemic. Governments in Europe responded to the COVID-19 outbreak with various measures intended to slow down the transmission of the virus. These nation-wide restrictions, particularly the closure of schools, parks, playgrounds and recreational facilities, reduced the possibilities for maintaining an active and healthy lifestyle. On average physical activity levels appear to have dropped, despite some people increasing their physical activity.

One systematic review conducted mid-2020 found that, of 26 studies (which include studies from Italy, Spain, Croatia, Germany and Greece) that measured the change in the amount of time spent being physically active by adults, all but one reported overall decreases in physical activity level pre- versus post-COVID-19 lockdown (Stockwell et al., 2021[24]). A multinational survey across 14 countries (including 7 EU Member States: Austria, France, Germany, Italy, the Netherlands, Switzerland, and Spain) found that self-reported moderate to vigorous activity as well as vigorous activity in adults declined, by 41% and 42% respectively, during COVID-19 restrictions (Wilke et al., 2021[25]). While the study found no major differences between men and women, young and old participants saw greater decreases in physical activity than middle-aged people.

While there are signs that in some cases lockdown actually encouraged exercise and the development of new routines, this does not appear to make up for the overall loss in physical activity. A large number of studies show that while some people increased their physical activity during lockdown, a larger proportion saw a decrease in their activity levels (Stockwell et al., 2021[24]). Similarly, the Eurobarometer study found that while 9% of respondents increased their physical activity level, more than half reduced their physical activity – with 34% being active less frequently and 18% stopped being active completely (European Commission, 2022[7]).

Figure 2.8. Changes in physical activity due to COVID-19

Reported change in the frequency of physical activity during the COVID-19 pandemic, percentage of respondents



Note: Base for 100% reflects all respondents that selected one of the four statements (stopped, less frequent, same, more frequent).
Source: European Commission, (2022[7]), Special Eurobarometer SP525: Sport and physical activity, https://europa.eu/eurobarometer/surveys/detail/2668.

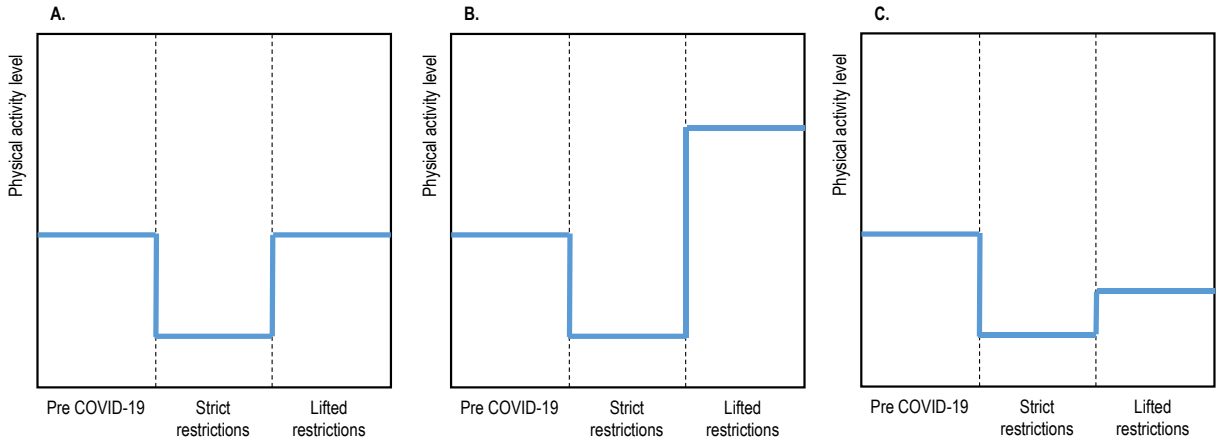
For children and adolescents, results are not straightforward. While some studies reported a decline in physical activity (Paterson et al., 2021[26]), others found that the amount of physical activity did not change (Kovacs et al., 2021[27]). However, many studies that looked at the type of physical activity agreed that the characteristics of sport and exercise changed and shifted towards less intensive activities such as walking and cycling. This may explain the drop in cardiorespiratory fitness documented in some countries since the outbreak of the pandemic (Jurak et al., 2021[28]; Jarnig, Jaunig and van Poppel, 2021[29]). In addition, studies consistently reported increases in screen time and sedentary behaviour – also linked to the use of remote and online learning.

One thing that we do not know currently is what lasting effects the pandemic will have on behaviour patterns once life returns to normal. Theoretically, three scenarios are possible (Figure 2.9):

- people get back to their pre-COVID-19 physical activity level,
- people become more physically active as they need to get back to normal or, even, they are willing to get engaged in as much activity as possible, or,
- people become less physically active as they have incorporated a less active standard in their daily routine.

In the Eurobarometer study, only 7% of respondents report plans to be more physically active after the COVID-19 pandemic ends (European Commission, 2022[7]). Urgent actions are needed to counteract this problem and to ensure that the low levels of physical activity caused by the COVID-19 pandemic and related restrictions do not become the new normal.

Figure 2.9. Theoretical patterns of change in physical activity level due to the COVID-19 pandemic



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3 The burden of insufficient physical activity

Increasing physical activity levels in the population can have a considerable impact on population health and on health care expenditures. This chapter quantifies the burden of current physical activity levels, and shows the potential impact of meeting recommended activity levels. It looks at life expectancy, incidence of non-communicable diseases, per capita and total health care expenditure, among other metrics. Two scenarios are modelled: meeting the minimum recommended physical activity level of 150 minutes of moderate-intensity activity per week, as well as meeting the higher level of 300 minutes per week.

Key messages

- Policies to increase physical activity levels can have a considerable impact on population health: if everyone were to meet the minimum guidelines of 150 minutes of moderate-intensity physical activity per week, this would prevent more than 10 000 premature deaths per year across 27 EU Member States.
- Moreover, the life expectancy in people who are insufficiently active would increase by 7.5 months, increasing the average life expectancy for the total population by nearly 2 months.
- Increasing physical activity levels to 150 minutes of moderate-intensity physical activity per week would prevent 11.5 million new cases of NCDs by 2050, including 3.8 million cases of cardiovascular disease, 3.5 million cases of depression, nearly 1 million cases of type 2 diabetes and more than 400 000 cases of cancer.
- Policies to increase physical activity levels would also have a positive impact on health care expenditure, saving EU Member States nearly EUR PPP 8 billion per year, or 0.6% of their total health care budget on average.
- Meeting the higher guidelines of 300 minutes of moderate-intensity physical activity per week would result in 2-3 times higher impacts on the population level: increasing the life expectancy of physically inactive people by nearly 16 months; preventing 30 000 premature deaths per year and 27 million new cases of NCDs over 30 years; and reducing health care expenditure by EUR PPP 17 billion per year.

Infographic 3.1. The population health and economic benefits of physical activity

The Population Health and Economic Benefits of Physical Activity

Meeting the WHO guidelines of 150 minutes of moderate-intensity physical activity per week across 27 European countries would:

Increase the life expectancy of **people who are insufficiently active** by **7.5 months**

Increase average **life expectancy** by **2 months**

Prevent over **10 000 premature deaths** per year

Save **EUR PPP 14 per capita** in **healthcare expenditure** – a total of **EUR PPP 8 billion** per year

Reduce **total health expenditure** by **0.6%**

Avoid **11.5 million** cases of **non-communicable diseases** over the next three decades, including:

- **3.5 million** cases of **depression**
- **3.8 million** cases of **cardiovascular disease**
- **400 000** cases of **cancer**

Quantifying the burden of insufficient physical activity makes a strong case for investing in prevention

Insufficient physical activity and related non-communicable diseases increase the burden on health systems. In this chapter, the Strategic Public Health Planning for Non-Communicable Diseases (SPHeP-NCDs) model is used to calculate the impact of insufficient physical activity on non-communicable diseases and their health care expenditure for the 27 EU Member States (EU27).

The OECD has developed the SPHeP-NCDs model to quantify the impact of major risk factors on population health and the economy. To calculate the burden of insufficient physical activity, the OECD SPHeP-NCDs model is run for two scenarios. The "baseline" scenario is based on current levels of insufficient physical activity. The "no insufficient physical activity" scenario reflects a hypothetical state in which everyone achieves a sufficient level of physical activity. By comparing the outputs of these two scenarios, the burden of current insufficient physical activity levels can be calculated. Note that this analysis aims to capture the total existing burden of insufficient physical activity, rather than the potential impact of reductions in physical inactivity (e.g. the target in the WHO's Global Action Plan on Physical Activity 2018-30 to reduce physical inactivity by 10% by 2025, and 15% by 2030 (WHO, 2018[1])).

To model a "no insufficient physical activity" scenario, a cut-off value for insufficient physical activity first needs to be defined. This is based on the recently published WHO guidelines for physical activity (WHO, 2020[2]) (see Chapter 1). For adults, the general recommendation is to engage in at least 150-300 minutes of moderate-intensity aerobic physical activity; or at least 75-150 minutes of vigorous-intensity aerobic physical activity per week, or a combination.

To be able to compare different types of physical activity, the OECD SPHeP-NCDs model measures physical activity as MET-minutes per week (see Box 3.1), using an average value of 4 METs for moderate-intensity physical activity and 8 METs for vigorous physical activity (WHO, n.d.[3]).

Box 3.1. Metabolic equivalent of task, or METs

Metabolic equivalent of task (METs) is a measure to reflect the intensity of physical activities, and allows comparison between them. One MET is the energy equivalent expended per unit of time by an individual while seated at rest. More intense activities, which cost more energy expenditure than being seated at rest, are attributed higher METs:

Light-intensity physical activity (LPA) is between 1.5 and <3 METs. This includes driving a car, ironing, light cleaning activities, or other incidental activities that do not result in a substantial increase in heart rate or breathing rate.

Moderate-intensity physical activity (MPA) is between 3 and <6 METs. This includes activities such as gardening, dancing or brisk walking.

Vigorous-intensity physical activity (VPA) is 6 or more METs. This includes activities such as fast swimming (training or competition) or running (at least 8 km per hour).

This paper follows the commonly used average values of 4 METs for MPA and 8 METs for VPA. For example, 60 minutes of moderate-intensity physical activity translate into 240 MET-minutes (4 METs x 60 minutes), as does 30 minutes of vigorous-intensity physical activity (8 METs x 30 minutes).

Source: WHO (2020[2]), WHO guidelines on physical activity and sedentary behaviour, https://www.who.int/publications/i/item/9789240015128; WHO (n.d.[3]), Global Physical Activity Questionnaire (GPAQ) Analysis Guide, http://www.who.int/chp/steps/GPAQ/en/index.html.

Following the WHO guidelines, for this report two scenarios of "no insufficient physical activity" are modelled:

- **Scenario 1: "150 minutes per week"** In this hypothetical scenario, everyone in the population meets the minimum recommendation of 150 minutes of moderate-intensity[1] exercise per week (equivalent of 600 MET-minutes per week). Technically, this means that in the model the physical activity levels of people doing less than 600 MET-minutes per week are increased to 600 MET-minutes per week. For people who already do more than 600 MET-minutes per week, their level of physical activity remains unchanged.
- **Scenario 2**: **"300 minutes per week"** As the WHO guidelines indicate, higher levels of physical activity provide additional health benefits (WHO, 2020[2]). The upper limit of the recommendations is to do twice as much (i.e. more than 300 minutes of moderate-intensity activity per week), and the cut-off value can therefore be set at 1 200 MET-minutes per week. Again, technically this means that everyone doing less than 1 200 MET-minutes per week sees their physical activity level increased to this level. For people who already do more than 1 200 MET-minutes per week, their level of physical activity remains unchanged.

The choice was made to present two scenarios because 150 minutes of moderate intensity exercise, or 600 MET-minutes per week, is a commonly used cut-off value for insufficient physical activity in the literature (see Box 3.2). However, it is a conservative scenario, where only the bare minimum recommendations are met. By also including the 300 minutes (1 200 MET-minutes per week) scenario the greater potential of physical activity can be explored.

Box 3.2. Defining insufficient physical activity

A large number of studies looking at the impact of low physical activity use a cut-off of 600 MET-minutes per week, albeit under different formulations (e.g. 5×30 minutes of MPA; 150 minutes of MPA; 600 MET-minutes/week; 150 min MPA or 75 min VPA/week or combinations) (Ding et al., 2017[4]). Other cut-off values used include "3×20 min VPA" (480 MET-minutes per week), "≥1 200 MET-minutes per week" (considered as high physical activity), as well as minutes of exercise without a MET-value specified.

Rather than MET-minutes, some studies use energy expenditure (e.g. ≥1.5 kcal/kg/day) to measure physical activity levels (Ding et al., 2017[4]). Another commonly used measure in burden studies is "any leisure time physical activity", "any VPA", "exercised in the past 2 weeks", or variations thereof. These approaches cannot be used in the OECD SPHeP-NCD model, which uses MET-minutes per week to quantify physical activity.

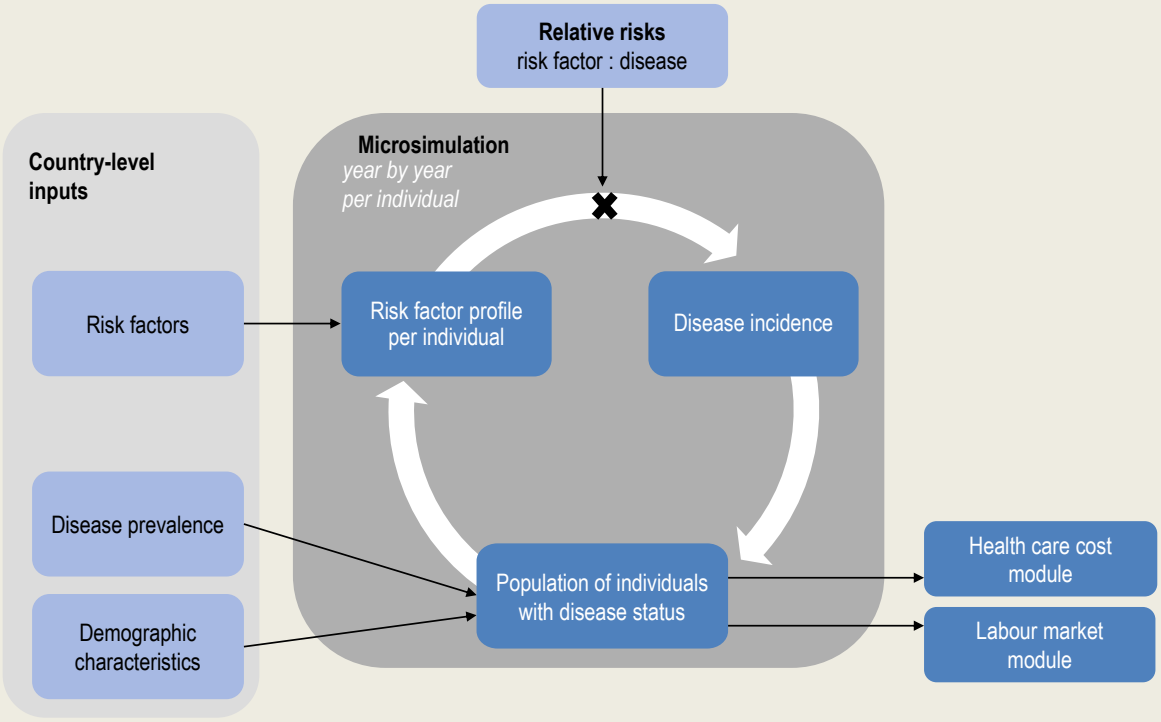
For information on the OECD SPHeP-NCDs model, and how it is used to model insufficient physical activity, please see Box 3.3, as well as the online technical documentation available at: http://oecdpublichealthexplorer.org/ncd-doc.

Box 3.3. Modelling insufficient physical activity in the OECD SPHeP-NCDs model

The OECD SPHeP-NCDs model is an advanced systems modelling tool for public health policy and strategic planning. It is used to predict the health and economic outcomes of the population of a country or a region up to 2050. The model includes a comprehensive set of key behavioural and physiological risk factors (e.g. body mass index (BMI), physical activity, alcohol consumption, blood pressure) and their associated non-communicable diseases (NCDs) and other medical conditions. The model covers 53 countries, including OECD member countries, G20 countries, EU27 countries and OECD accession and selected partner countries. Note that the model does not take into account the impact of risk factors on communicable diseases.

For each country, the model uses demographic and risk factor characteristics by age- and sex-specific population groups from international databases. These inputs are used to generate synthetic populations, in which each individual is assigned demographic characteristics and a risk factor profile (see Figure 3.1). Based on these characteristics, an individual has a certain risk of developing a disease each year. For each year, a cross-sectional representation of the population can be obtained, to calculate health status indicators such as life expectancy, disease prevalence and disability-adjusted life years using disability weights.

Figure 3.1. Schematic overview of the OECD SPHeP-NCDs model



Note: This schematic is highly simplified and focuses on the disease component – it does not reflect some other components of the model (including births, immigration, emigration, death, remission and fatality).
Source: OECD (2019[5]), SPHeP-NCDs Technical Documentation, http://oecdpublichealthexplorer.org/ncd-doc.

The OECD SPHeP-NCDs model uses country-specific data on physical activity prevalence from the Institute for Health Metrics and Evaluation (IHME) (IHME, n.d.[6]). IHME data on physical activity is measured in total metabolic equivalent of task minutes per week (MET-minutes per week). While the

data from IHME is provided in four categories, in the OECD SPHeP-NCDs model physical activity is modelled as a continuous variable. A piecewise linear function is assumed to model the cumulative distribution, calibrated in order to match the prevalence of the four available physical activity categories. A lower bound of 200 MET-minutes/week and an upper bound of 10 000 MET-minutes/week are applied in order to retain plausibility.

In the model, six diseases are directly related to insufficient physical activity through a relative risk: breast cancer, colon cancer, depression, type 2 diabetes, ischaemic heart disease and ischaemic stroke. As physical activity has an impact on BMI, a link between the two risk factors is modelled, indirectly linking physical activity to another six diseases: dementia, back pain, liver cancer, oesophageal cancer, atrial fibrillation, and haemorrhagic stroke (see 0 for details on the methodology behind this link, and Annex 3.B for results without the link). Physical activity is not linked to any potential increase in injuries, nor to any benefits in secondary prevention. The model takes into account the fact that individuals who do not develop a physical activity-related disease may develop other diseases.

Health care costs of disease treatment are estimated based on a per-case annual cost, which is extrapolated from national health-related expenditure data. The additional cost of multimorbidity is also calculated and applied. The extra cost of end-of-life care is also taken into account. In the model, people not dying from a physical activity-related disease continue to consume medical care for other conditions and incur medical costs.

Results are presented as annual averages or cumulative numbers for the period 2022-50. Single-year estimates are not used as they are affected by noise in the model. Since the scenario is introduced as a "shock" in 2022, rather than gradually over time, the annual average over 2022-50 reflects the impact in any of the years covered.

Previous estimates of the burden of insufficient physical activity primarily use a population attributable fraction (PAF) approach (Ding et al., 2017[4]; Lee et al., 2012[7]). PAF is the proportional reduction in population disease or mortality would occur if exposure to a risk factor were reduced. The benefit of the OECD SPHeP-NCDs model's microsimulation approach is that it takes into account all major NCDs, instead of being limited to the diseases for which a physical activity PAF is calculated. This means that it takes into account the effect of changes in morbidity and mortality on diseases not directly associated with physical activity (e.g. if people live longer due to being physically active, they can go on to develop other diseases). Moreover, the effect of multiple morbidities in one individual can be modelled.

Nevertheless, the results presented here are subject to limitations. Firstly, the impact of physical activity is limited to a set of 12 major diseases that are linked directly or indirectly to the prevalence of physical activity. However, there is emerging evidence of the impact of physical activity on a wider range of diseases and other health and well-being outcomes. Secondly, data on physical activity levels is generally self-reported, which has been shown to overestimate actual activity levels (Cerin et al., 2016[8]; Dyrstad et al., 2014[9]).

For more information on the OECD SPHeP-NCDs model, see the SPHeP-NCDs Technical Documentation, available at: http://oecdpublichealthexplorer.org/ncd-doc.

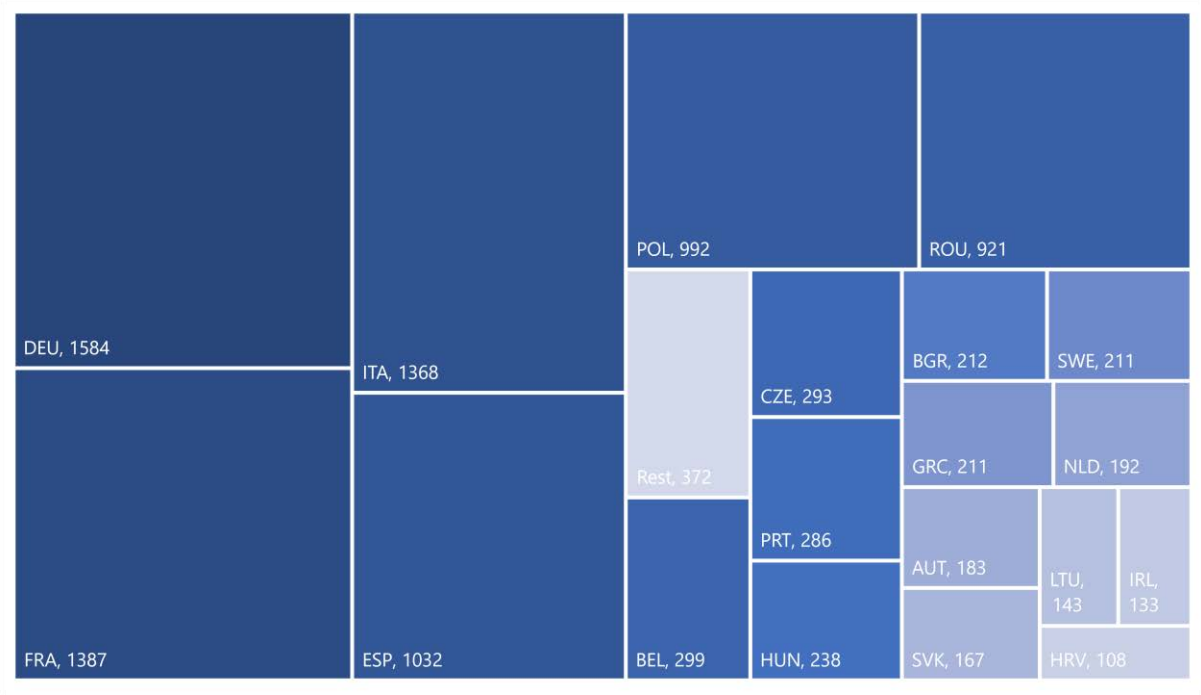
The burden of insufficient physical activity on population health

Physical activity could prevent more than 10 000 premature deaths per year

If everyone in the 27 countries would do at least 150 minutes of moderate-intensity exercise per week, 10 331 premature deaths (defined as deaths of people aged 30 to 70 years) would be avoided every year. This is similar to the number of deaths due to COVID-19 in that same age group in France and Germany combined in 2020. The five countries with the largest burden (Germany, France, Italy, Spain and Poland) make up three-fifths (62%) of the total burden across the 27 countries (Figure 3.2). While these are all countries with large populations, some smaller countries like Belgium and the Czech Republic also make up a considerable share of the total premature mortality burden. If the higher recommendations of 300 minutes of physical activity per week were met by everyone, nearly 30 000 premature deaths could be avoided per year.

Figure 3.2. Annual premature deaths due to insufficient physical activity

The impact of insufficient physical activity (defined as less than 150 minutes per week) on annual premature mortality (defined as deaths of people aged 30 to 70), average over 2022-50

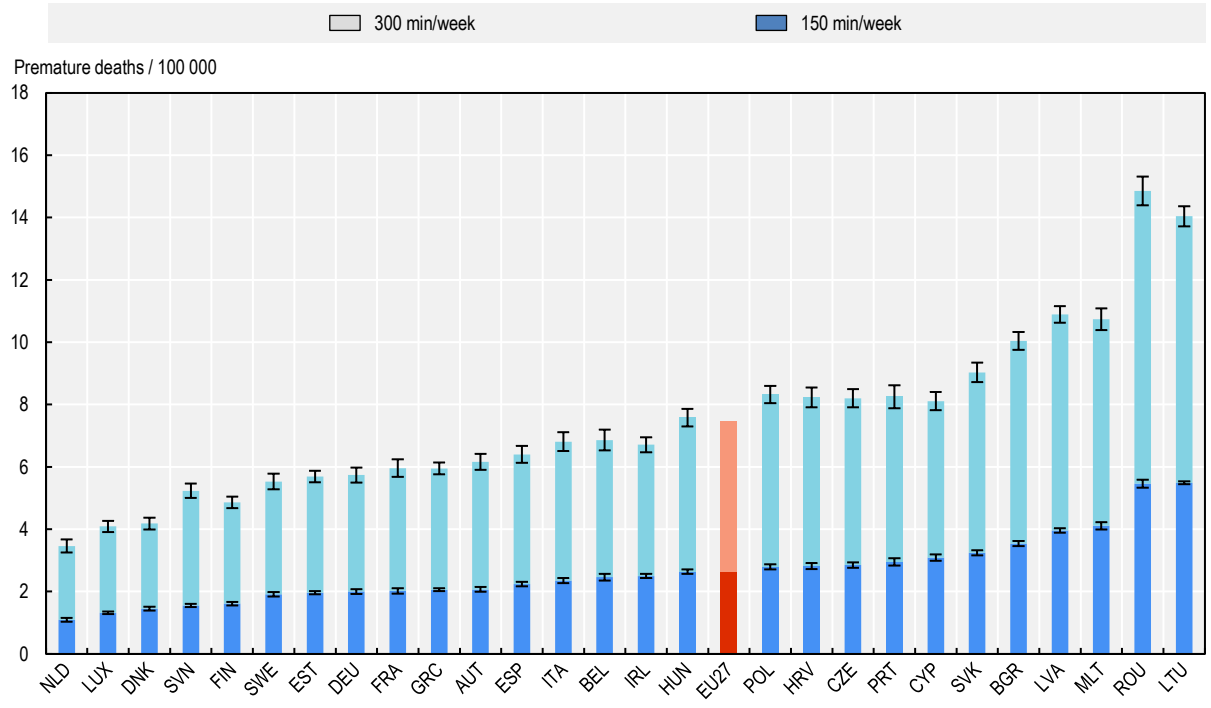


Note: Rest includes FIN (92), DNK (88), LVA (70), CYP (41), SVN (31), EST (24), MLT (17) and LUX (9); the numbers in the labels indicate the number of premature deaths per year.
Source: OECD SPHeP-NCDs model, 2022.

The premature mortality rate due to insufficient physical activity is the lowest in Northern European countries, where between 2022 and 2050 less than 2 people per 100 000 inhabitants will die prematurely every year due to the effects of insufficient physical activity (less than 150 minutes per week) (Figure 3.3). The premature mortality rate is considerably higher in Romania and Lithuania, where for every 100 000 inhabitants more than 5 people will die prematurely due to insufficient physical activity. On average in the 27 EU Member States, doing 150 minutes of moderate intensity physical activity per week would prevent 2.6 premature deaths per 100 000 inhabitants – and doing at least 300 minutes per week would prevent an additional 4.8 premature deaths per 100 000 inhabitants.

Figure 3.3. Premature mortality rate due to insufficient physical activity

The impact of insufficient physical activity (defined as less than 150 minutes per week or 300 minutes per week) on annual premature mortality (defined as deaths of people aged 30 to 70) per 100 000 inhabitants, average over 2022-50, with 95% confidence intervals



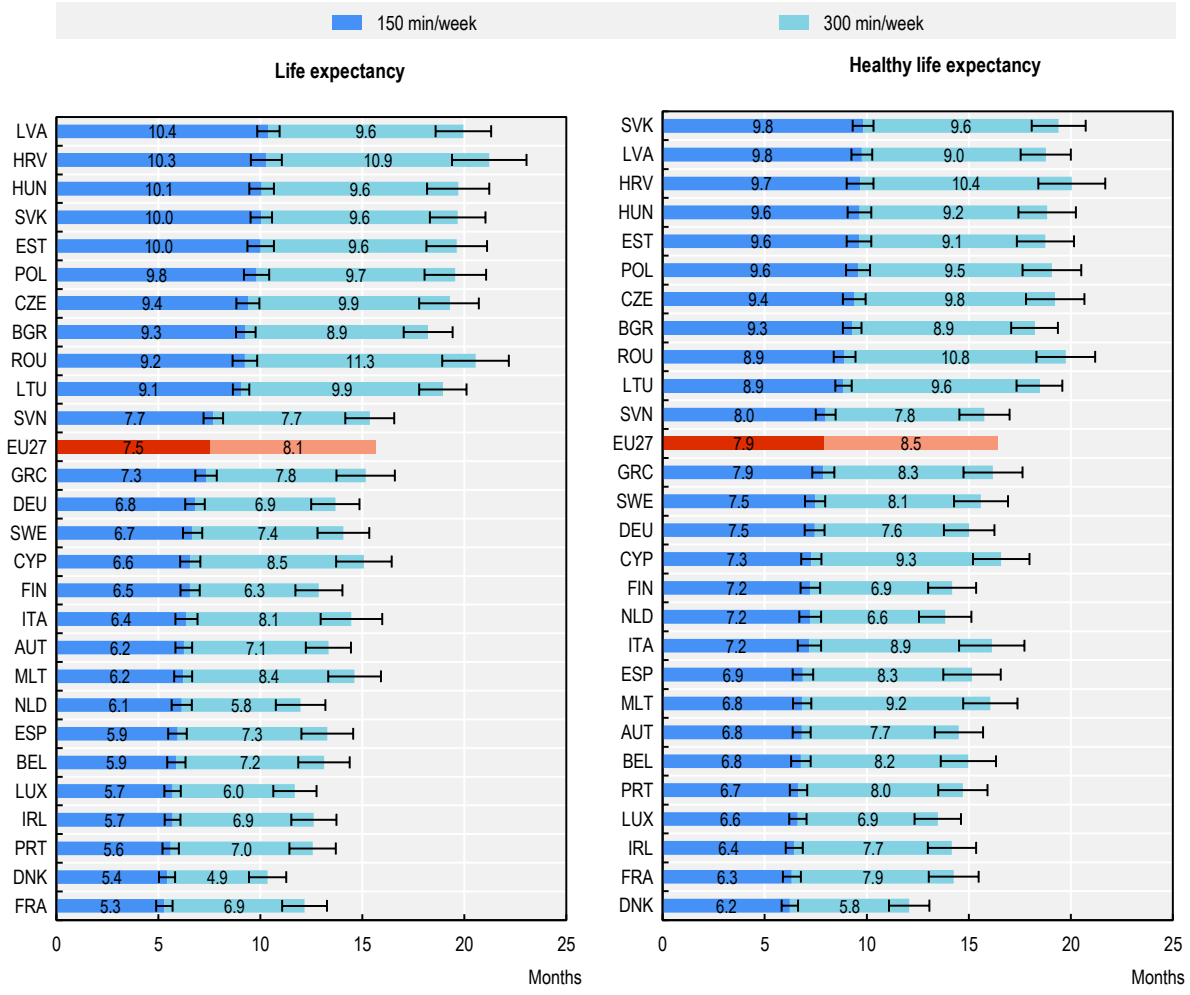
Source: OECD SPHeP-NCDs model, 2022.

People who are currently insufficiently active could increase their life expectancy by 7.5 months by moving more

If people who currently do less than 150 minutes of physical activity per week were to increase their physical activity to this target, their life expectancy would increase by 7.5 months (Figure 3.4). Their healthy life expectancy, which takes into account years lived with diseases (Box 3.4), would increase by 7.9 months. If everyone who is now doing less than 300 minutes of physical activity per week would increase their activity to this level, their life expectancy would increase by more than a year (15.7 months).

Figure 3.4. The impact of insufficient physical activity on life expectancy in the insufficiently active population

The impact of insufficient physical activity (defined as less than 150 minutes per week or 300 minutes per week) on the life expectancy or healthy life expectancy of people who are insufficiently active (months), average over 2022-50, with 95% confidence intervals



Note: The label for the 300 minutes per week scenario indicates the additional months as compared to the 150 minutes scenario, e.g. for Latvia, meeting the 150 minutes per week guidelines would increase life expectancy of inactive people by 10.4 months, while meeting the 300 minutes guidelines would save another 9.6 months, for a total increase in life expectancy of 20.0 months.
Source: OECD SPHeP-NCDs model, 2022.

Box 3.4. Life expectancy and healthy life expectancy

Life expectancy is a measure of mortality, as it reflects the age at which individuals are expected to die. Healthy life expectancy combines mortality with morbidity. It uses disease-specific disability weights to measure a disability-adjusted life expectancy.

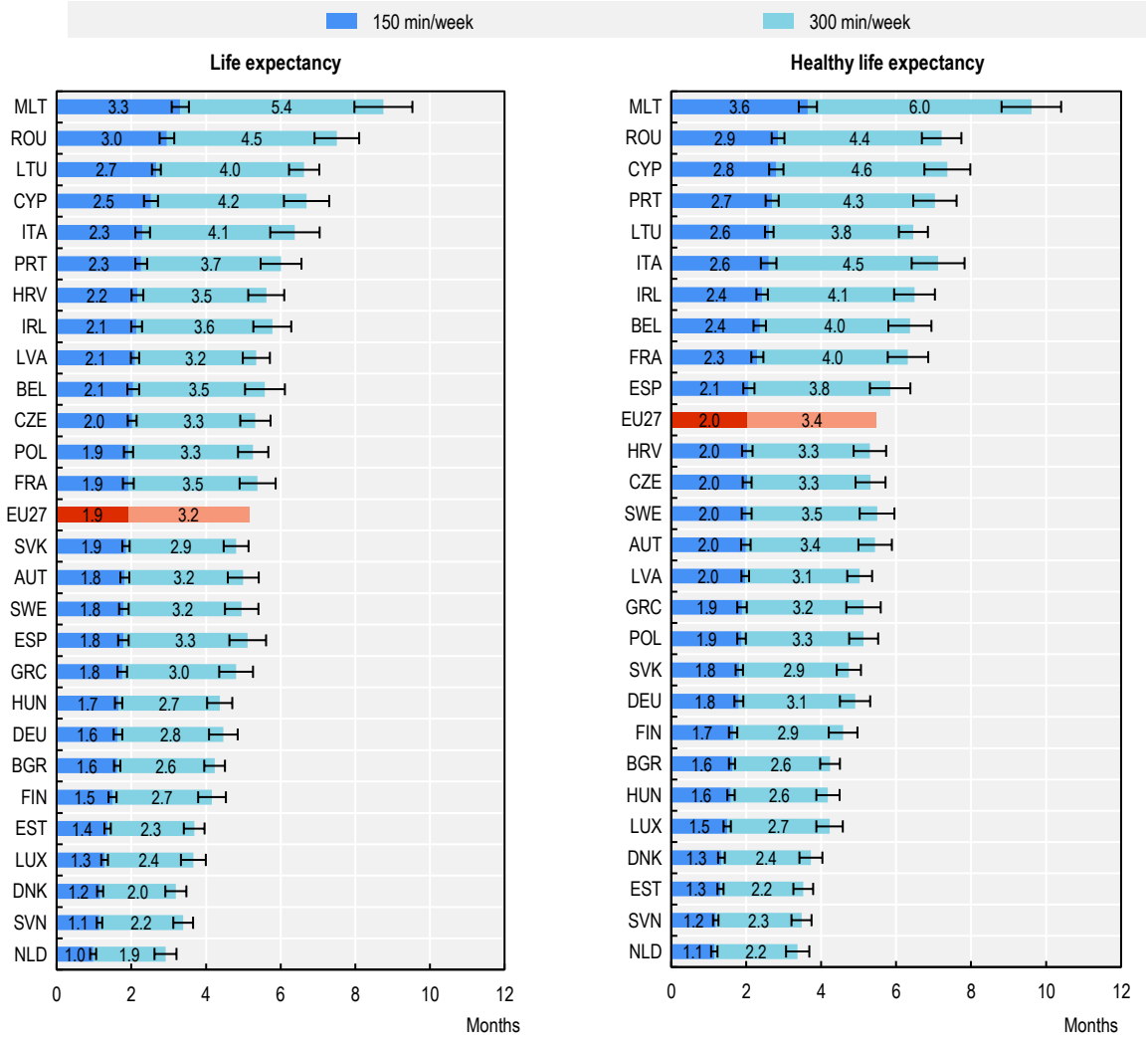
For example, if someone is expected to die at the age of 60 years (life expectancy is 60 years), but they spend the last 10 years of their life with a disease that has a disability weight of 0.5, their healthy life expectancy is 55 years (50 years in full health + 10 years at 50% reduced health).

Note that while healthy life expectancy is per definition lower than life expectancy, the *change* in life expectancy (as presented in Figure 3.4 and Figure 3.5) can be greater than the *change* in healthy life expectancy. This is because the disability weights can "discount" life-years gained. Going back to the previous example, if the same person lives to 70 years in the "no insufficient physical activity" scenario, this would be a gain of 10 life years. However, if there is no change in the onset of disease and these additional years are also spent with a 0.5 disability weight disease, the gain in healthy life expectancy would be only 5 years.

At a population level, insufficient physical activity reduces the average life expectancy in the 27 EU Member States by 1.9 months (Figure 3.5). When assuming a higher cut-off of 300 minutes, insufficient physical activity reduces life expectancy by 5.1 months. In other words, if everyone in the 27 countries would do at least 300 minutes of moderate-intensity physical activity per week, the average life expectancy of the total population would increase by nearly half a year. In comparison, EU Member States saw an average increase in life expectancy of 2.4 months per year between 2005 and 2018, due to advancements in health care, improvements in working and living conditions, healthier lifestyles and other factors (OECD/European Union, 2020[10]).

Figure 3.5. The impact of insufficient physical activity on population average life expectancy

The impact of insufficient physical activity (defined as less than 150 minutes per week or 300 minutes per week) on the average life expectancy or healthy life expectancy of the total population (months), average over 2022-50, with 95% confidence intervals



Note: The label for the 300 minutes per week scenario indicates the additional months as compared to the 150 minutes scenario, e.g. for Malta, meeting the 150 minutes per week guidelines would increase life expectancy by 3.3 months, while meeting the 300 minutes guidelines would save another 5.4 months, for a total increase in life expectancy of 8.7 months.
Source: OECD SPHeP-NCDs model, 2022.

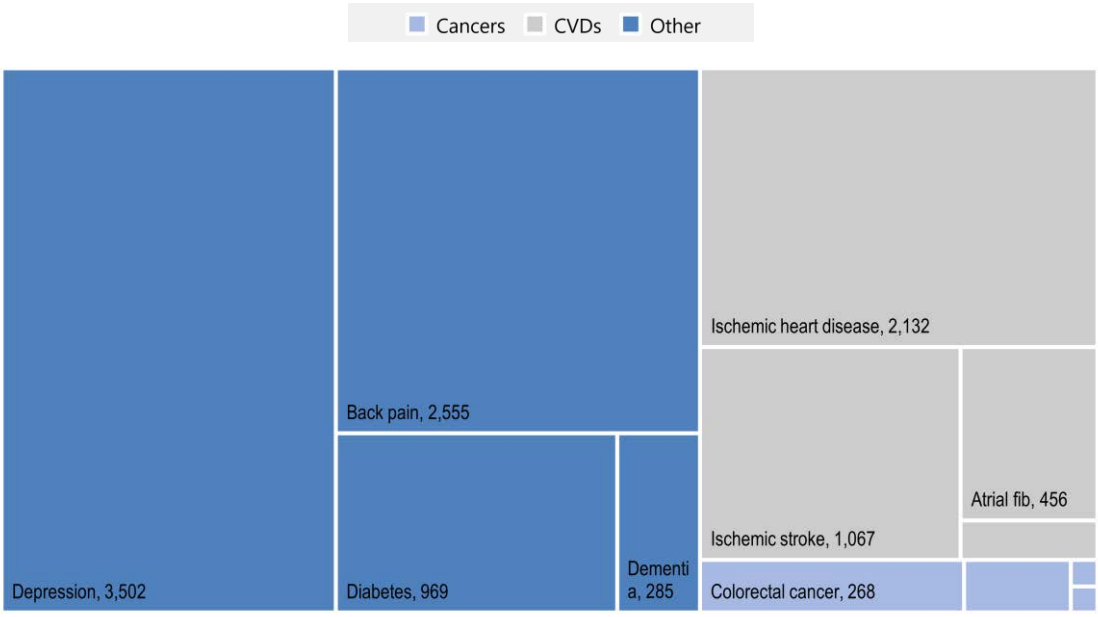
Countries with a high level of insufficient physical activity generally see a large impact on the average life expectancy of the population. On the other hand, countries such as Finland or the Netherlands have a lower level of insufficient physical activity, and the impact on the average life expectancy of the total population is therefore small.

Increasing physical activity could prevent 11.5 million new NCD cases by 2050

In the 27 countries, doing less than 150 minutes of moderate-intensity exercise per week is linked to 3.5 million new cases of depression between 2022 and 2050, as well as 3.8 million new cases of cardiovascular disease, nearly 1 million new cases of type 2 diabetes and over 400 000 new cancers (Figure 3.6). Across the 12 diseases affected by physical activity in the model, doing at least 150 minutes of physical activity could prevent 11.5 million new NCDs over the next 29 years. Meeting the target of 300 minutes of physical activity per week would prevent a further 16 million cases.

Figure 3.6. The burden of disease due to insufficient physical activity

The impact of insufficient physical activity (defined as less than 150 minutes per week) on number of new disease cases (thousands), total over 2022-50 and for all the 27 EU Member States

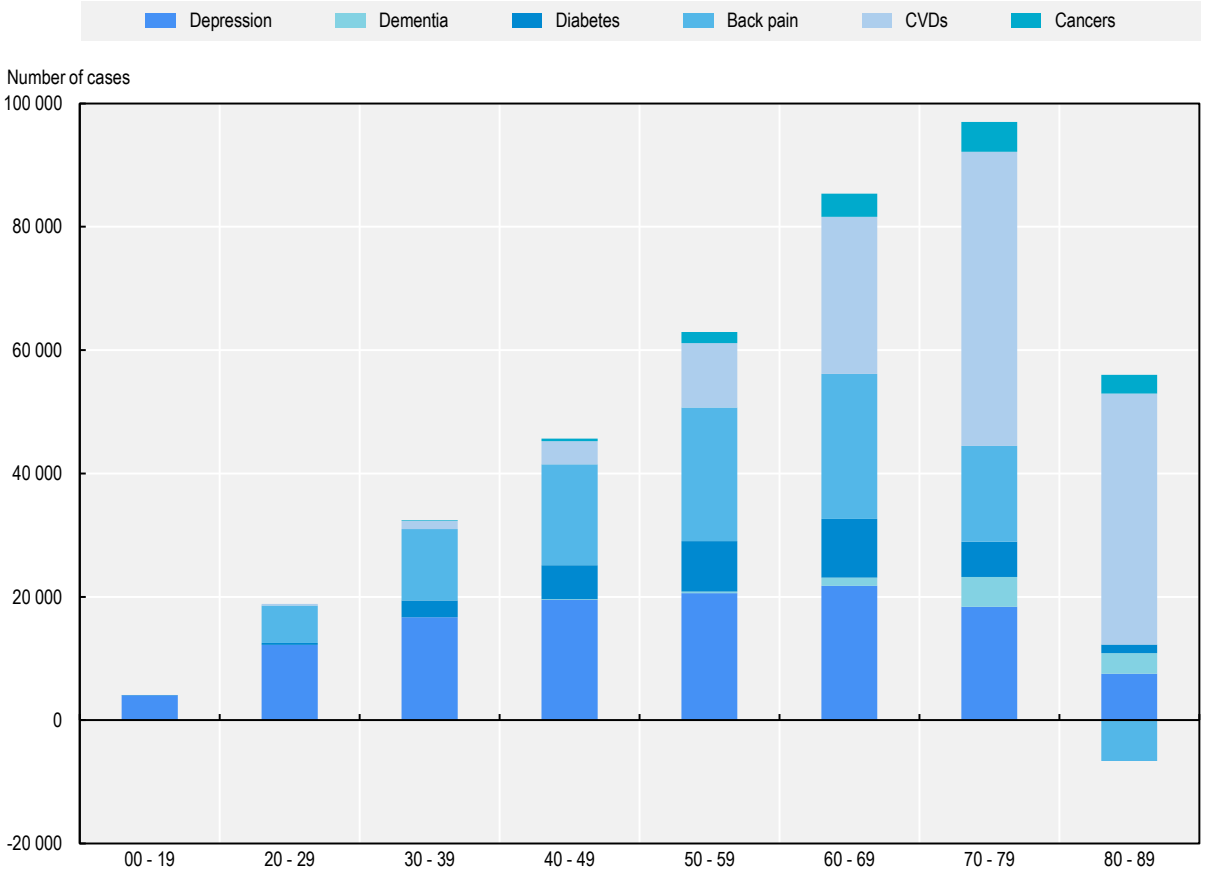


Note: Not (fully) labelled are breast cancer (108), haemorrhagic stroke (104), oesophageal cancer (14) and liver cancer (13). Graph is limited to diseases included in the OECD SPHeP-NCDs model and may not capture all diseases linked to physical inactivity. The numbers in the labels indicate the number of new disease cases due to insufficient physical activity in thousands over 2022-50.
Source: OECD SPHeP-NCDs model, 2022.

The majority of disease cases due to insufficient physical activity affect people between the age of 50 and 79 years (Figure 3.7). Cardiovascular diseases account for 40% of all diseases due to insufficient physical activity in people aged 60 to 79 years, and nearly three-fourths of the burden for people over 80 years old. While cancers and cardiovascular diseases are rarer in the younger age groups, insufficient physical activity does cause a considerable burden of depression and back pain in this population. Notably, in the over-80 age group there is a decrease in back pain issues due to insufficient physical activity. This is likely the result of the decrease in life expectancy associated with insufficient physical activity, which reduces the number of people in this age group and consequently the number of diseases they develop.

Figure 3.7. The burden of disease due to insufficient physical activity by age group

Number of new disease cases per year by age group due to insufficient physical activity (defined as less than 150 minutes per week), average over 2022-50 and for all the 27 EU Member States



Source: OECD SPHeP-NCDs model, 2022.

If everyone were to meet the minimum physical activity guidelines of at least 150 minutes of moderate-intensity physical activity per week, 3.9% of all new type 2 diabetes cases would be avoided between 2022 and 2050, as well as 2.3% of cardiovascular disease cases. Meeting the upper guidelines of 300 minutes of physical activity per week would prevent nearly 10% of new diabetes cases, 5.2% of new cardiovascular disease cases, and around 4% of new cancer cases.

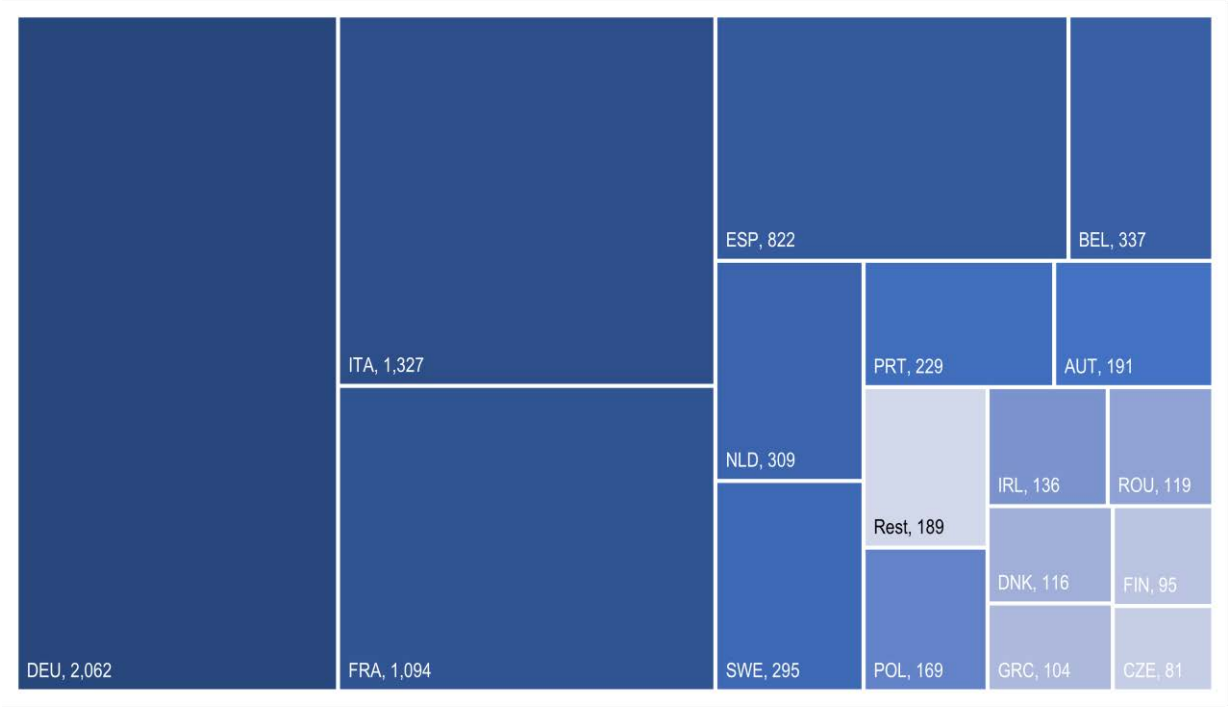
The burden of insufficient physical activity on health care expenditure

Increasing physical activity can save nearly EUR PPP 8 billion per year in health care expenditure

If everyone were to do at least 150 minutes of physical activity per week, a total of EUR PPP[2] 7.7 billion per year could be saved in health care expenditure across the 27 countries (Figure 3.8) – more than the total annual health care expenditure of Lithuania and Luxembourg combined. A large part of the burden is in countries with large populations and high health care expenditure levels, such as Germany, Italy and France.

Figure 3.8. Health care expenditure due to insufficient physical activity

The impact of insufficient physical activity (defined as less than 150 minutes per week) on total annual health care expenditure in EUR PPP (millions), average over 2022-50

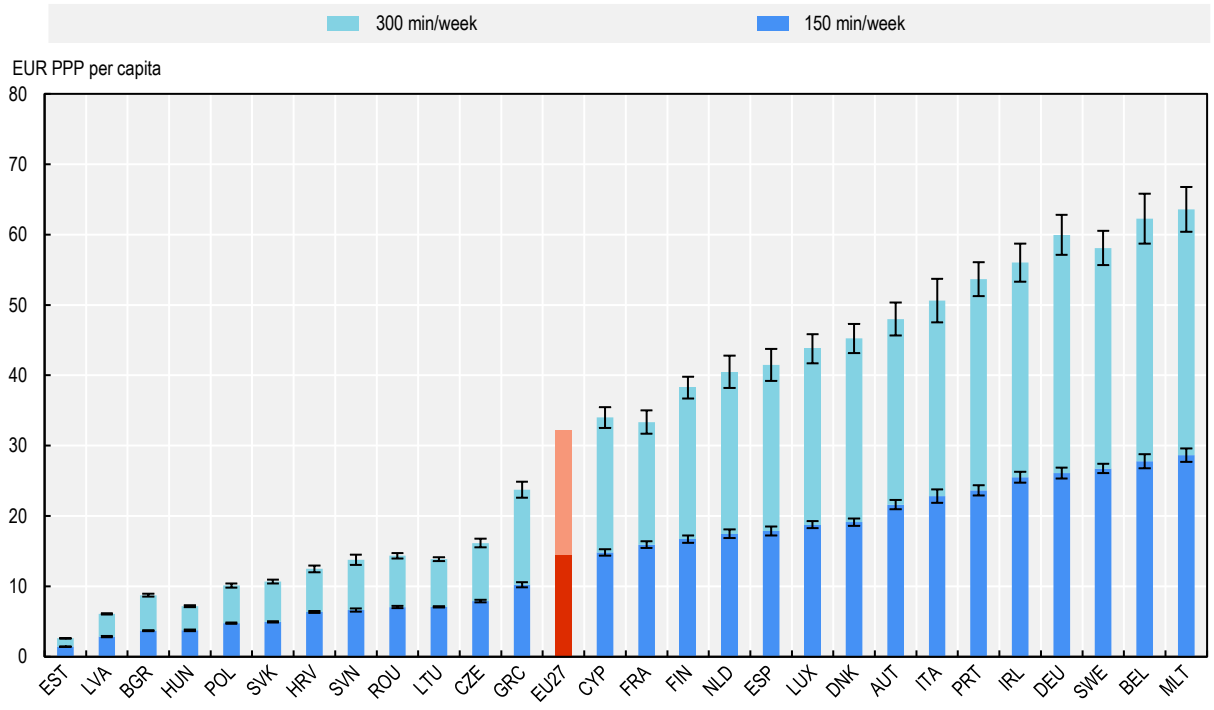


Note: Rest includes HUN (34), SVK (25), HRV (24), BGR (22), CYP (20), LTU (18), LUX (13), SVN (13), MLT (12), LVA (5) and EST (2); the numbers in the labels indicate the total annual health care expenditure in millions of EUR PPP.
Source: OECD SPHeP-NCDs model, 2022.

Countries with higher health care expenditures in general tend to spend more on treating diseases linked to insufficient physical activity, and vice versa (Figure 3.9). However, the prevalence of insufficient physical activity also plays an important role: while per capita health care expenditure in Malta, Portugal and Italy is around the EU average, the high prevalence of insufficient physical activity in these countries means that the associated health care expenditure is higher than the average. The 27 countries included in the analysis could save on average EUR PPP 14.4 per capita per year between 2022 and 2050 if everyone met at least the minimum physical activity guidelines of 150 minutes of exercise per week. Meeting the guidelines of 300 minutes per week would save another EUR PPP 17.7 per capita, for a total of EUR PPP 32.2 per capita, per year.

Figure 3.9. Health care expenditure per capita due to insufficient physical activity

The impact of insufficient physical activity (defined as less than 150 minutes per week or 300 minutes per week) on annual per capita health care expenditure in EUR PPP, average over 2022-50, with 95% confidence intervals



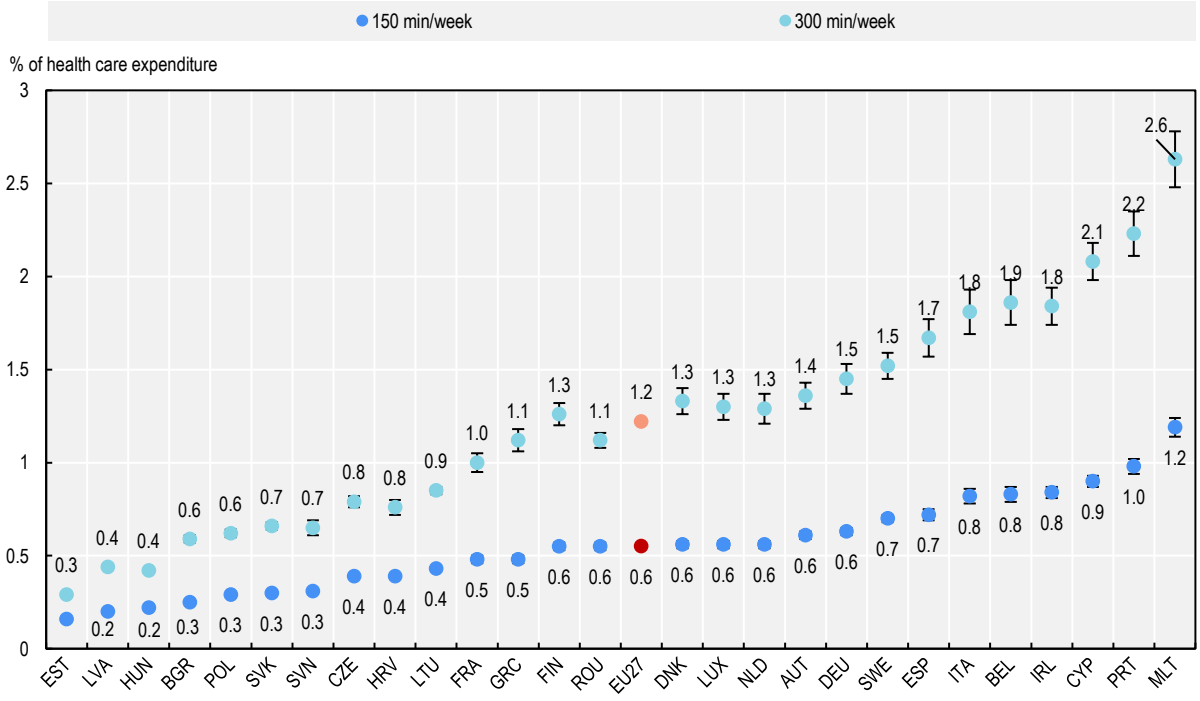
Source: OECD SPHeP-NCDs model, 2022.

EU Member States could on average save 0.6% of their health care expenditure by increasing physical activity

EU Member States could save on average 0.6% of their health care expenditure if everyone did at least 150 minutes of physical activity per week (Figure 3.10). If everyone were to meet the 300 minutes guidelines, this would save 1.2% of total health care expenditure. The potential savings from doing at least 150 minutes of physical activity range from 0.16% of total health care expenditure in Estonia, to 1.2% in Malta.

Figure 3.10. Health care expenditure attributable to insufficient physical activity

The impact of insufficient physical activity (defined as less than 150 minutes per week or 300 minutes per week) on annual health care expenditure as a percentage of total health care expenditure, average over 2022-50, with 95% confidence intervals



Note: Missing label for Estonia (150 min/week) is 0.16.
Source: OECD SPHeP-NCDs model, 2022.

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Annex 3.A. Linking physical activity to BMI in the OECD SPHeP-NCDs model

In addition to providing protective effects for a range of diseases, increased physical activity can also contribute to modest weight loss (Swift et al., 2014[11]; Stensel, King and Thackray, 2016[12]). As this lowers a person's body-mass index (BMI), physical activity can reduce the risk of developing diseases associated with a high BMI. To capture this effect, the OECD SPHeP-NCDs model includes a link between physical activity (PA) and BMI.

The PA/BMI link is based on the widely used energy balance model developed by Hall et al. (2011[13]). An interactive version of this model is available in the form of the Body Weight Planner on the website of the National Institute of Diabetes and Digestive and Kidney Diseases (https://www.niddk.nih.gov/bwp). By varying the inputs (age, sex, weight, height, starting level of physical activity), the Body Weight Planner was used to generate a dataset to train an algorithm for the OECD SPHeP-NCDs model.

For each data entry, calorie intake was set to remain at the baseline level. The level of physical activity was assumed to change on day one, which resulted in a change in calorie output. METs were converted to calories using the following formula (Jette, Sidney and Blumchen, 1990[14]):

$$\frac{MET\ value * 3.5 * body\ weight\ in\ kg}{200} = calories\ per\ minute$$

Based on this formula, the increase in daily calorie expenditure was converted to MET-minutes per week as follows:

$$\frac{Calories\ per\ day * 200}{3.5 * body\ weight\ in\ kg} * 7\ days = METminutes\ per\ week$$

The resulting change in BMI was measured after one year. At this point, roughly half of the weight loss will have taken place. Reaching a bodyweight plateau is estimated to take around 10 years (Hall KD, 2011[13]), but the simulator does not go beyond 500 days. The estimated weight loss is therefore an underestimation compared to the theoretical maximum. However, in reality it can be argued that few people would maintain the increased level of physical activity and the constant level of calorie intake consistently over 10 years.

A regression analysis was used to understand how BMI is affected by changes in physical activity, as well as by age, sex, starting BMI and starting level of physical activity. Age, sex and starting BMI were all not significant, nor was an interaction term between age and changes in physical activity. This is consistent with the fact that the relative contribution of these variables to the change in BMI was also small. The interaction effect between sex and changes in physical activity was significant, as were starting physical activity level, changes in physical activity and the square function of the change in physical activity. The final algorithm used in the model is therefore:

$$\Delta BMI = -0.0001\,046 * \Delta PA + 0.0000\,000\,204 * \Delta PA^2 +$$

$$0.00000\,313 * sex * \Delta PA + 0.0174\,877 * PA_{start} - 0.0245613.$$

With

$$\Delta BMI = change\ in\ BMI\ in\ percentage$$

$$\Delta PA = change\ in\ physical\ activity\ in\ METs/week$$

$$sex = (1, male)(2, female)$$

$$PA_{start} = starting\ level\ of\ physical\ activity\ (as\ per\ below)$$

The level of physical activity in the Body Weight Planner is indicated by a number between 1.4 and 2.5, with a value of 1.4 representing a sedentary person. Using the "estimate your level" function in the Planner, the levels were approximately matched to the categories in the OECD SPHeP-NCDs model as follows:

Annex Table 3.A.1. Levels of physical activity in the Body Weight Planner and the OECD SPHeP-NCDs model

Leisure time physical activity	Body weight planner	OECD SPHeP-NCDs model
No exercise	1.4	Inactive (below 600 METs/week)
Walking/non-strenuous exercise once a week	1.5	Low level of activity (between 600 and 3 999 METs/week)
Regular activities more than once a week	1.7	Moderately active (between 4 000 and 7 999 METs/week)
Strenuous activities several times a week	1.9	Highly active (8 000 METs/week)

Note: The level of physical activity in the Body Weight Planner's "estimate my level" was done only based on exercise-related physical activity, while the physical activity levels in the OECD SPHeP-NCDs model include also other types of physical activity, such as transport, work, gardening and housework.

Based on the algorithm, an inactive, healthy-weight man who starts to do moderate-intensity exercise twice a week for 30 minutes (delta MET minutes per week = 240) can expect to lose 1.5 kg after one year (assuming his calorie intake and non-exercise physical activity stay the same). If an overweight woman with a low level of physical activity starts to do vigorous-intensity exercise for 30 minutes, three times per week, she would lose just under 5 kg after one year.

It is important to note that the PA/BMI link in the OECD SPHeP-NCDs model is a hypothetical link to estimate the theoretical burden of disease. In this scenario, all insufficient physical activity is artificially eliminated and this increase in physical activity is linked to a change in BMI for all affected individuals. In reality however, people might not lose weight as they may increase their calorie intake or subconsciously reduce their energy expenditure in unstructured physical activity (Stensel, King and Thackray, 2016[12]).

Annex 3.B. The burden of insufficient physical activity without the link with BMI

The results presented in the main report consider the direct impact of insufficient physical activity on health, as well as the impact of insufficient physical activity on BMI and its subsequent impact on health. As high BMI is an important risk factor for a number of diseases, this link results in a substantial increase in the burden of disease. Alternatively, it is possible to model only the direct impact of insufficient physical activity on health.

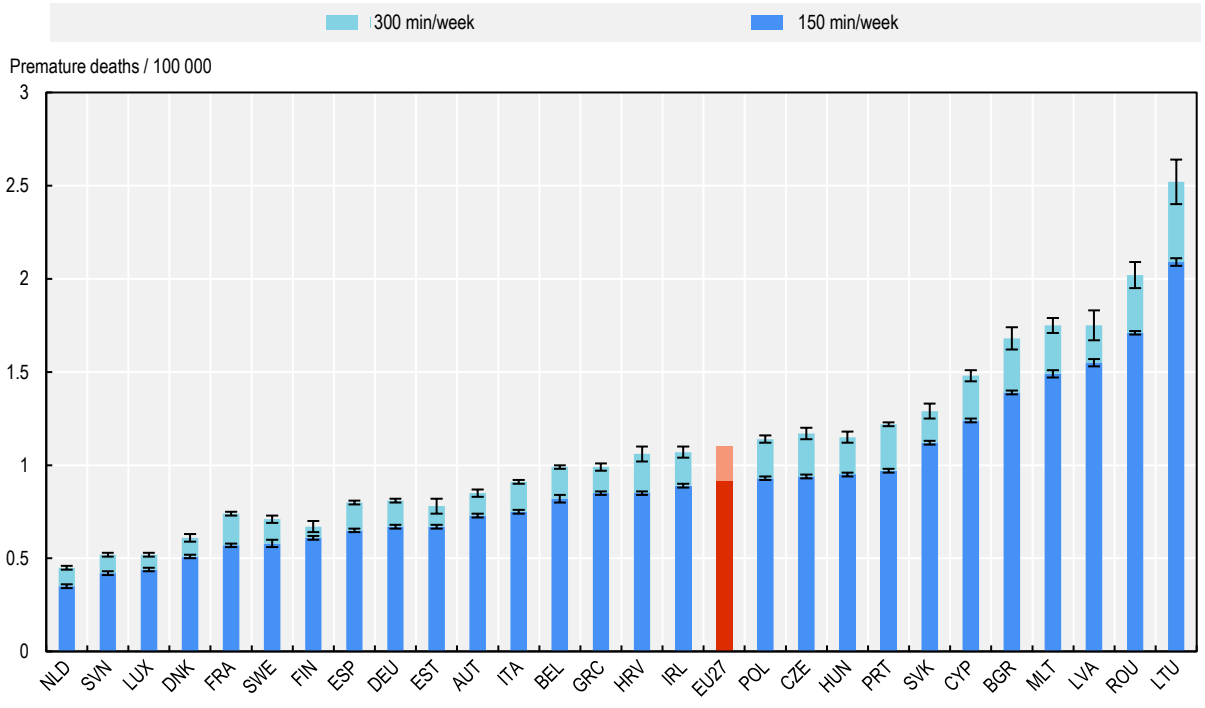
One of the reasons not to include a link between physical activity and BMI is that this makes the results directly comparable to previous OECD work on the burden of obesity (OECD, 2019[15]), as both would consider only one risk factor and its consequences. However, it has to be noted that this is more of an academic exercise. In reality, insufficient physical activity does have an impact on BMI, and this adds to the burden on health and the economy. For policy makers who want to understand the impact of insufficient physical activity, and promote policies to increase activity levels, it is important to have a picture of the full extent of the issue.

Below are the results of the OECD SPHeP-NCDs model on the burden of insufficient physical activity, without the link between physical activity and BMI (PA/BMI link).

When only considering the direct impact of insufficient physical activity on premature mortality, 0.9 deaths can be avoided per 100 000 inhabitants by meeting the guidelines of 150 minutes of physical activity per week (Annex Figure 3.B.1). The additional effect of meeting the higher guidelines of 300 minutes per week is only 0.2 deaths per 100 000 inhabitants more. This is because the largest relative risks of developing disease are associated with doing less than 150 minutes per week. Including the PA/BMI link increases the impact of the 150 minutes scenario nearly three-fold (from 0.9 per 100 000 to 2.6 per 100 000).

Annex Figure 3.B.1. Premature mortality rate due to insufficient physical activity (no PA/BMI link)

The impact of insufficient physical activity (defined as less than 150 minutes per week or 300 minutes per week) on annual premature mortality (defined as deaths of people aged 30 to 70) per 100 000 population, average over 2022-50, with 95% confidence intervals

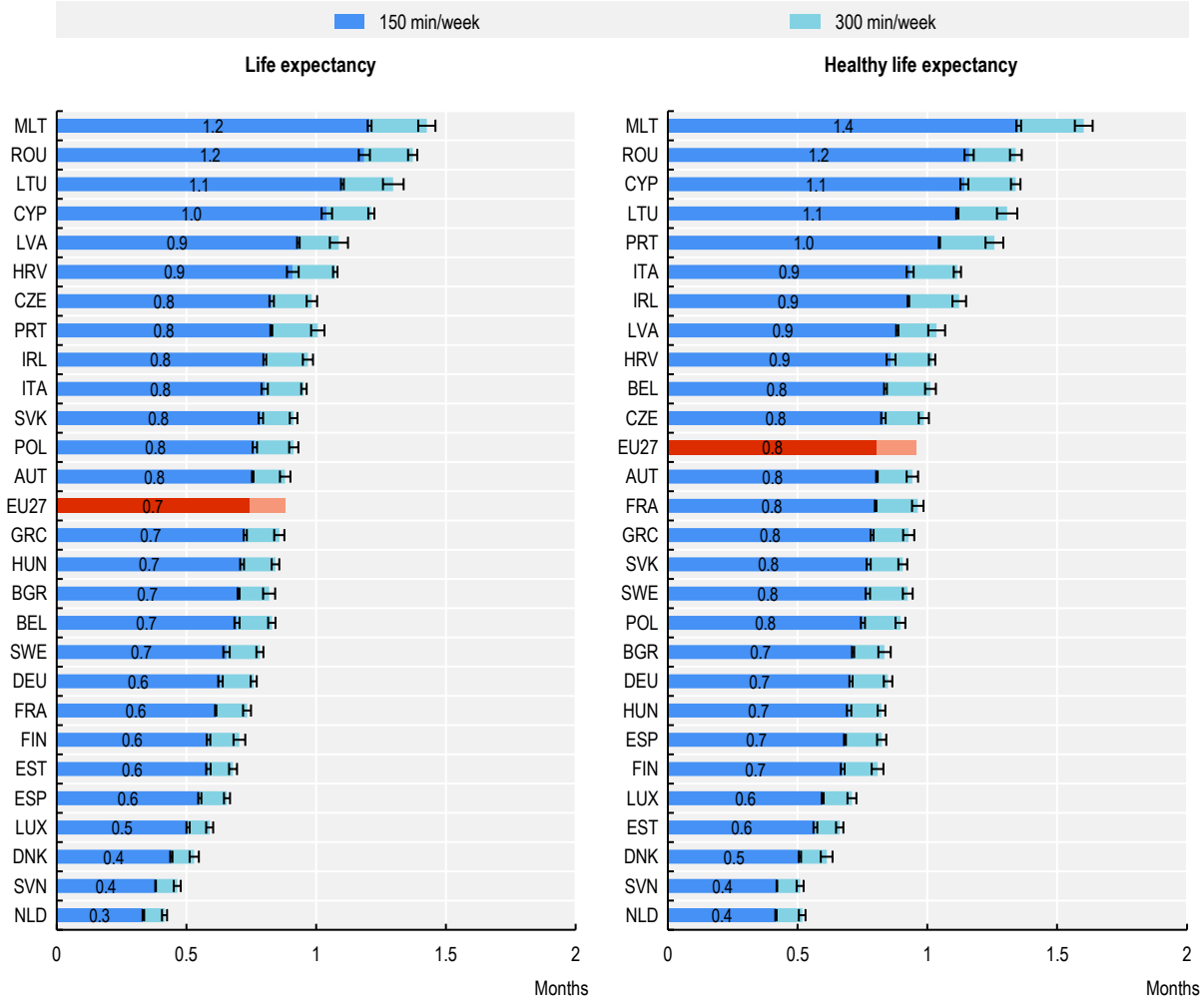


Source: OECD SPHeP-NCDs model, 2022.

Average life expectancy in the 27 countries decreases by 0.7 months due to the effects of insufficient physical activity, when not including the link between physical activity and BMI (Annex Figure 3.B.2). Again, the additional benefit of doing 300 minutes per week versus 150 minutes per week is small – adding only 0.1 months of life expectancy. The impact with the PA/BMI link is more than twice as large, at 1.9 months for the 150 minutes scenario. The ranking of the countries from low to high impact does not change much with the exclusion of the PA/BMI link.

Annex Figure 3.B.2. The impact of insufficient physical activity on population average life expectancy (no PA/BMI link)

The impact of insufficient physical activity (defined as less than 150 minutes per week or 300 minutes per week) on the average life expectancy or healthy life expectancy of the total population (months), average over 2022-50, with 95% confidence intervals

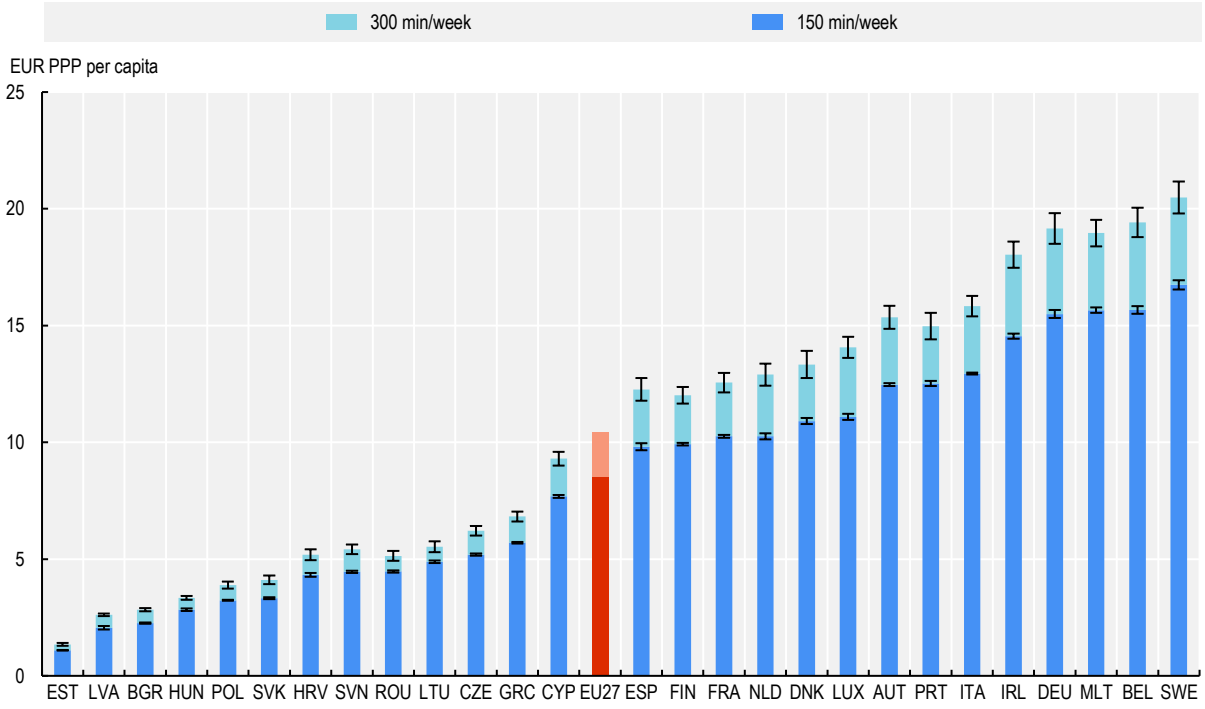


Note: The label indicates the impact for the 150 minutes per week scenario.
Source: OECD SPHeP-NCDs model, 2022.

When looking only at the direct effects of insufficient physical activity on health care expenditure, meeting the guidelines of 150 minutes per week would save on average EUR PPP 8.5 per capita per year across the 27 EU Member States (Annex Figure 3.B.3). This is about 40% lower than when the effect of physical activity on BMI is included, in which case the impact is EUR PPP 14.4 per capita per year. Again, there is not much change in the specific countries with relatively high and low impacts.

Annex Figure 3.B.3. Health care expenditure per capita due to insufficient physical activity (no PA/BMI link)

The impact of insufficient physical activity (defined as less than 150 minutes per week or 300 minutes per week) on annual per capita health care expenditure in EUR PPP, average over 2022-50, with 95% confidence intervals

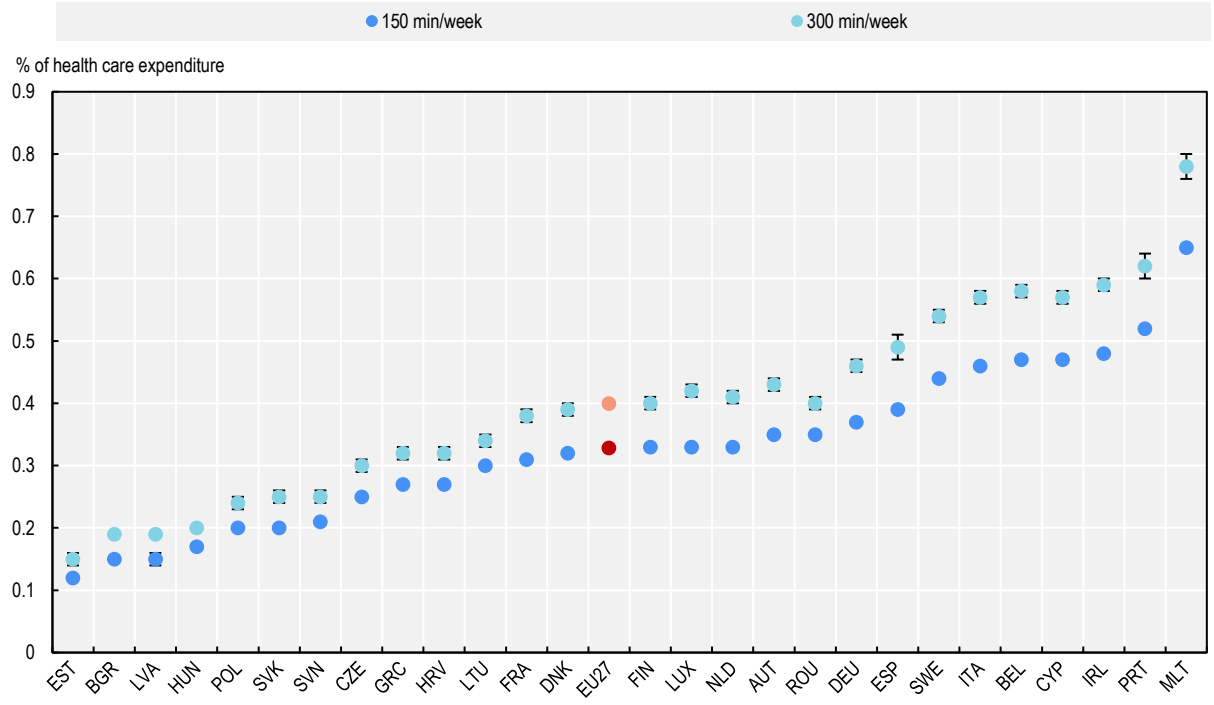


Source: OECD SPHeP-NCDs model, 2022.

EU Member States could save 0.3% of their health care expenditure if everyone did at least 150 minutes of physical activity per week – when looking only at the direct impact of physical activity (Annex Figure 3.B.4). This is again about 40% lower than when the effect of physical activity on BMI is taken into account.

Annex Figure 3.B.4. Health care expenditure attributable to insufficient physical activity (no PA/BMI link)

The impact of insufficient physical activity (defined as less than 150 minutes per week or 300 minutes per week) on annual health care expenditure as a percentage of total health care expenditure, average over 2022-50, with 95% confidence intervals



Source: OECD SPHeP-NCDs model, 2022.

Notes

[1] Going forward in this chapter, for readability, physical activity levels will be expressed only in minutes of moderate-intensity activity, without the vigorous intensity-equivalent. Note that 150 minutes of moderate-intensity exercise and 75 minutes of vigorous exercise (the lower bound recommendations) both translate into 600 MET-minutes; and 300 minutes of moderate exercise and 150 minutes of vigorous exercise (the higher bound recommendations) both translate into 1 200 MET-minutes.

[2] Purchasing power parities (PPPs) are the rates of currency conversion that try to equalise the purchasing power of different currencies, by eliminating the differences in price levels between countries.

4 Policy options to increase physical activity

To increase physical activity levels in the population, a wide range of policy options exists. This chapter provides an overview of these policies, drawing on case studies from across the European Union. The chapter covers interventions in schools, workplaces, and in the health care setting, as well as communication and information policies, policies to increase access to sports facilities, and to change the environment to encourage active transport and outdoor activities. It advocates for a comprehensive, well-funded package of policies to get people moving.

Key messages

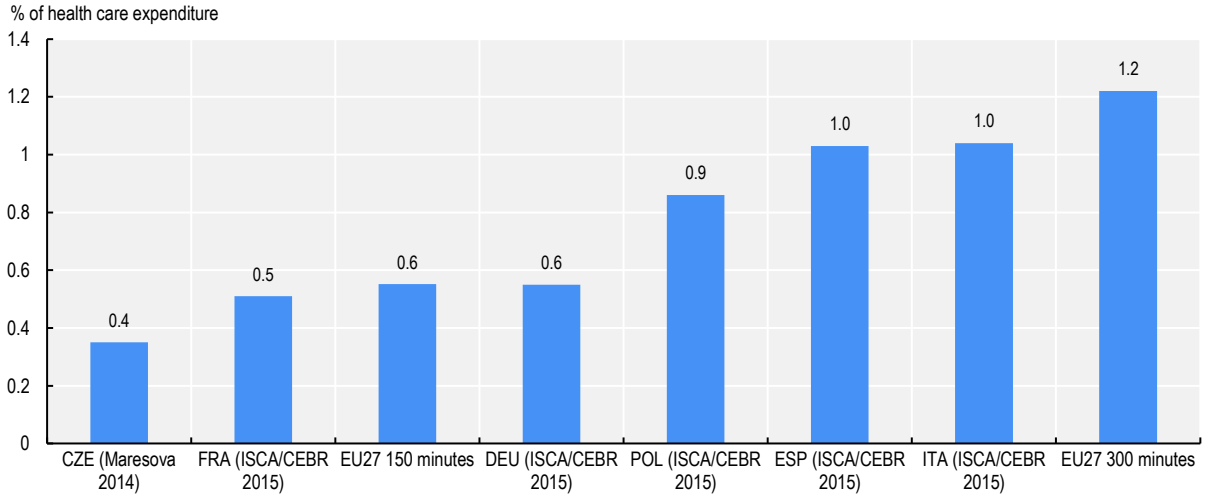
- Increasing physical activity levels can have considerable health and economic benefits, including an increase in life expectancy, fewer cases of NCDs, and lower health care expenditure.
- Despite many countries having stepped up their efforts to promote physical activity, there remain gaps in the policy response. For example, schemes to promote active travel to school or work are only present in 14 and 17 out of 27 EU Member States, respectively.
- A wide range of policy options exist to increase population physical activity, which improve population health, as well as reduce health care expenditure, including:
  - setting-specific programmes, in schools, workplaces and the health care system
  - policies to increase access to sports facilities
  - urban design, environment and transport policies
  - communication and information policies
- As physical activity is a complex behaviour, a comprehensive package of policies is needed to target all its drivers at the same time, with sufficient and sustained funding and evaluation.
- A policy package aimed at increasing physical activity, implemented in 36 countries, would save around EUR 14 billion in health cost by 2050 (equivalent to the total annual health care expenditure of Greece) and return EUR 1.7 for every EUR 1 invested.

Increasing physical activity levels can have considerable health and economic benefits

Despite the recognised health and well-being benefits of physical activity, many people do not move enough. As shown in Chapter 3, eliminating insufficient physical activity would have a considerable impact on population health: if everyone in the 27 EU Member States would do at least 150 minutes of moderate-intensity activity per week, more than 10 000 premature deaths could be avoided each year, and 11.5 million cases of new NCDs would be prevented over the next three decades. Increasing physical activity would also reduce the burden on countries' health care expenditure. If the guidelines of 150 minutes of moderate-intensity physical activity per week were met, countries would save 0.6% on average of their health care expenditure – a total of EUR 8 billion per year.

The impact of insufficient physical activity on health care expenditure presented in this report is comparable to previous estimates, albeit at the lower end of the range (Figure 4.1). Since the OECD SPHeP-NCDs model takes into account diseases and health care cost not related to insufficient physical activity (e.g. if people live longer due to increased physical activity levels, they would develop other conditions), the impact estimated by the OECD model is expected to be lower than when using a PAF approach (see also Chapter 3, Box 3.3).

Figure 4.1. Previous estimates of the economic burden of insufficient physical activity



Note: The previous estimates presented above all use a PAF approach.
Source: Reproduced from Ding et al., (2017[1]), complemented with analysis on 27 EU Member States from the OECD SPHeP-NCDs model, 2022.

It has to be noted that the benefits of increased physical activity reach far beyond population health and health care expenditure. A healthier population translates into a larger, more productive workforce. The health and economic impact of the current and potential future pandemics may be lessened (Box 4.1). Finally, there are beneficial links between physical activity policies and other important policy areas such as the environment (Box 4.2). Altogether, there is a strong case to invest in policies that increase physical activity levels in the population.

Box 4.1. Physical activity and the COVID-19 recovery

As discussed in Chapter 2, physical activity levels appear to have decreased during the COVID-19 pandemic. Policies to encourage physical activity would not only mitigate this effect, but can have wider impacts on the COVID-19 recovery.

Firstly, physical activity improves the health of the population, making it more resilient against COVID-19 and any potential future outbreaks. Evidence has shown that physical activity provides protective effects against severe COVID-19 outcomes (Sallis et al., 2021[2]), and people without NCDs are less likely to develop severe symptoms or die from COVID-19 (Jordan, Adab and Cheng, 2020[3]). Moreover, regular moderate to vigorous physical activity has been shown to increase the potency of vaccination (Chastin et al., 2021[4]).

Secondly, physical activity can reduce the considerable impact that the pandemic has had on mental health and well-being. Since March 2020, prevalence of anxiety and depression has increased and in some countries it even doubled (OECD, 2021[5]). Physical activity can help to tackle this issue, as it is as effective as cognitive behavioural therapy or antidepressant medication for mild depressive symptoms (WHO, 2019[6]). Moreover, organised sports provide important social connections after a period of social distancing.

Thirdly, the sports and exercise industry was hit hard during the pandemic, as confinement and other containment measures meant long-term closures for many sports facilities, clubs and informal exercise groups. Across the EU Member States, it is estimated that as much as EUR 47 billion has been lost in sports-related GDP (15.3% of total sports-related GDP) due to COVID-19, as well as 844 773 jobs (16.1% of total sports-related employment) (European Union, 2020[7]). Investing in sports and physical activity can therefore contribute to the economic recovery as well as public health.

Box 4.2. The interconnection between physical activity and environmental policies

Climate change and the degradation of the environment are considered some of the major global threats of our age, and many countries have put in place extensive policies to reduce emissions, mitigate the impacts of climate change and restore biodiversity. Fortunately, many environmental policies also have a beneficial impact on physical activity – and vice versa.

- **Active transport**: To reduce emission and energy use, climate change policies have been introduced to encourage cycling, walking and other forms of sustainable, active transport.
- **Green space**: Parks and other green spaces sequester carbon dioxide, help mitigate the urban heat island effect and provide habitat for urban biodiversity, whilst also providing space for people to be active.
- **Clean air**: Air pollution is a major environmental concern, and can impede people from exercising outside. Policies to reduce pollution, such as taxes, can therefore have a dual effect.

In **Finland**, the government adopted a resolution in 2018 to promote active and sustainable modes of transportation. The resolution highlights both the environmental and public health impact of active transport. A number of programmes support this resolution, which are co-funded by different ministries, including both the ministry of environment and of social affairs and health, and are carried out in partnership with the transport sector and nongovernmental organisations (NGOs). The Smart to School programme, for example, aims to increase active travel to school, improve road safety, strengthen a culture of active transportation and support schools to implement policies that promote these objectives. Similarly, the Smart to Work forum is a nationwide network of governmental, labour and NGOs that promotes active travel as a strategy to increase levels of physical activity among workers and encourage climate friendly choices.

Source: OECD (2017[8]), Healthy People, Healthy Planet, www.oecd.org/health/healthy-people-healthy-planet.htm; Abu-Omar, Gelius and Messing (2020[9]), Physical activity promotion in the age of climate change, 10.12688/F1000RESEARCH.23764.2; (2018[10]), Programme and government resolution to promote walking and cycling, https://www.lvm.fi/en/-/programme-and-government-resolution-to-promote-walking-and-cycling-970101; WHO (2021[11]), 2021 physical activity factsheets for the European Union Member States in the WHO European Region, https://www.euro.who.int/en/health-topics/disease-prevention/physical-activity/data-and-statistics/physical-activity-fact-sheets/2021-physical-activity-factsheets-for-the-european-union-member-states-in-the-who-european-region.

Policy makers can choose from a range of options to increase physical activity levels

A wide range of policy options exist to increase population physical activity, including regulatory, economic and information policies. Some are setting- or target-group specific – for example interventions in schools, workplaces or in the health care setting. Other policies aim to increase access to sports facilities, or change the environment to encourage active transport and outdoor activities. Communication policies can be used to encourage physical activity and inform people about what to do, when and where (Figure 4.2). The remainder of this chapter discussed the different policy options and presents selected case studies from EU Member States.

Figure 4.2. Policy options to increase physical activity

School-based interventions

- Physical education classes
- Active school breaks
- Funding for after school activities
- Active transport to and from school

Workplace-based interventions

- Counselling and information
- Behavioural strategies, like point-of-decision prompts to take the stairs
- Environmental strategies, such as standing desks
- Active transport to and from the office

Interventions in the healthcare setting

- General behavioural counselling
- Prescribing physical activity
- Healthcare-led exercise interventions

Interventions in the sports sector

- Programmes to increase sports participations
- Investment in sports infrastructure
- Funding for local sports clubs

Urban design, environment and transport policies

- Policies to improve road safety
- Planning guidelines to increase parks, trails and other green spaces
- Investments in cycling lanes or public transport

Information and communication policies

- Physical activity guidelines
- National campaigns
- Apps with information about the availability of resources and activities

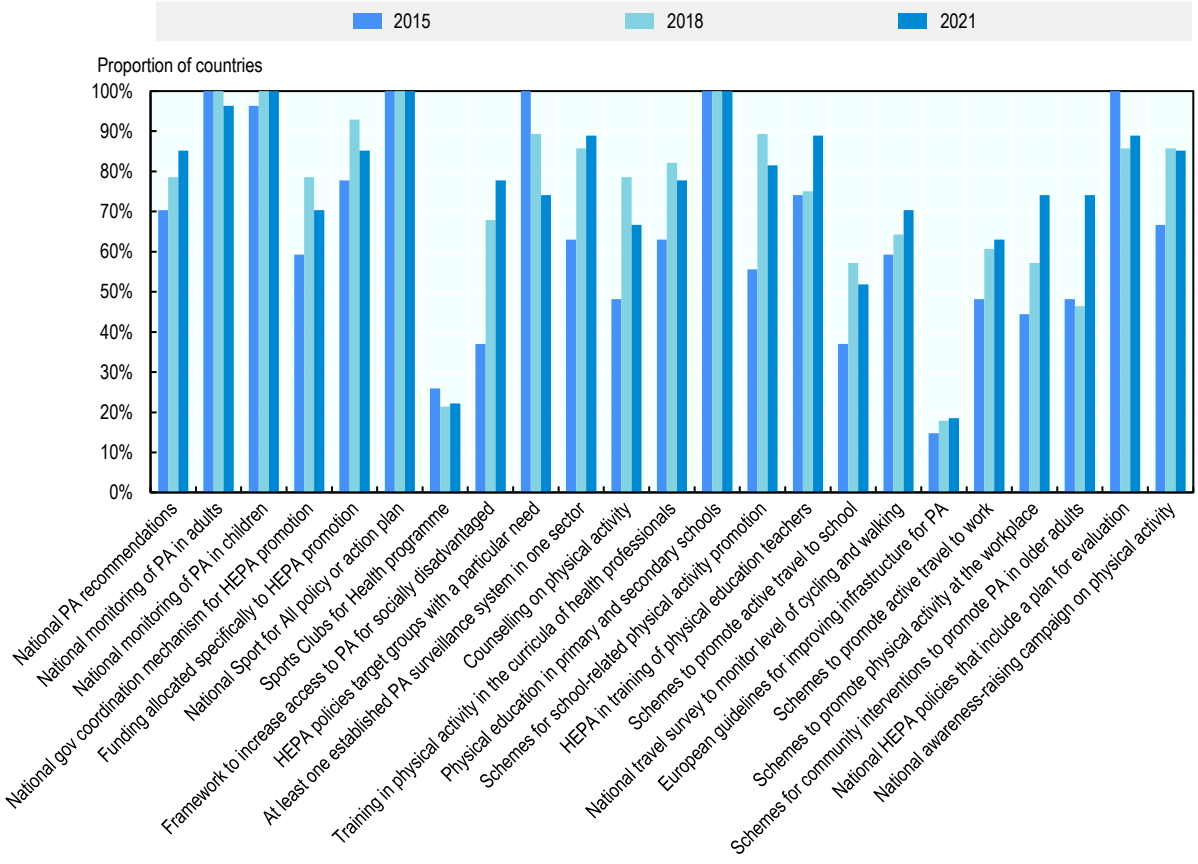
Note: This list includes examples and is not exhaustive.
Source: OECD/WHO analysis.

Almost all EU Member States monitor physical activity levels in adults and children, and have physical education in schools (Figure 4.3). Moreover, since 2015, there has been a strong increase in the number of countries that have policies to improve access to physical activity for socially disadvantaged groups and older adults, and schemes for physical activity promotion in schools and the workplace.

However, there is still considerable scope to expand the policy response across the Europe. In particular, few countries have implemented programmes to involve sports clubs in health promotion (Sports Clubs for Health, see also Box 4.6), or systematically apply the European guidelines in planning leisure-time infrastructure (IMPALA, see also Box 4.8). Schemes to promote active travel to school or work are only present in 14 and 17 out of 27 EU Member States, respectively. Moreover, while in 2015 all countries reported having a HEPA policy or action plan that specifically targets high needs groups (e.g. young children, older adults people in low socio-economic groups, people with a disability), in 2021 only 20 out of 27 countries had such policies.

Figure 4.3. Physical activity policies in EU Member States

Proportion of EU Member States that have implemented each of the 23 health-enhancing physical activity policies and strategies recommended by the EU Council



Note: Direct comparisons of the data must be made with caution, as the questions in the three surveys were slightly different, new focal points may have collected data differently and different Member States responded to the survey in each round (Greece did not participate in the survey in 2015, and the United Kingdom was no longer a Member State of the EU in 2021).
Source: WHO (2021[11]), 2021 physical activity factsheets for the European Union Member States in the WHO European Region, https://www.euro.who.int/en/health-topics/disease-prevention/physical-activity/data-and-statistics/physical-activity-fact-sheets/2021-physical-activity-factsheets-for-the-european-union-member-states-in-the-who-european-region.

School-based programmes

Schools can play an important role in increasing physical activity, by providing education on the importance of physical activity as well as by offering physical activity opportunities during and after school. Physical education classes have been shown to make students more active in, outside, and beyond school, as well as having a positive effect on students' social skills and social development (OECD, 2019[12]). It may also improve educational outcomes (Norris et al., 2019[13]) and contribute to healthy lifestyles that last into adulthood (Dohle and Wansink, 2013[14]; Black et al., 2019[15]). In all EU Member States (WHO, 2021[11]), schools are required by law to provide physical education classes.

However, there is considerable variation in how physical education is defined and quantified, how it relates to and encompasses health education, how it is inscribed and regarded within the curriculum, and, importantly, how it is implemented and assessed in schools (OECD, 2019[12]). While all EU Member States reported having physical education classes, only 74% monitored their quality (WHO, 2021[11]).

Besides physical education classes, physical activity can also be encouraged in schools through targeted programmes (Box 4.3). In the EU, programmes to encourage active school breaks have been implemented in 12 countries, active breaks during lessons in 16 countries, after-school physical activity programmes in 21 countries and programmes to encourage active travel to school in 14 countries (WHO, 2021[11]).

Box 4.3. School-based physical activity programmes

Hungary: Mandatory daily physical education classes

The 2012 Public Act on Education introduced daily physical education (PE) classes as of school year 2012/2013 for grades 1, 5 and 9 in a staggered implementation system. This meant that by September 2015, all students in the Hungarian education system had compulsory PE classes every day. Since September 2013, the new National Core Curriculum regulated also the content of PE classes. The philosophy of the new curriculum focused more on health objectives and on the cognitive contents enabling emotional and social development. Beside the daily PE policy, a national health-related physical fitness surveillance system (so called NETFIT) was introduced in 2015, which monitors students' fitness level on an annual basis (Kovacs et al., 2018[16]).

Austria: "Move children healthy 2.0"

"Move children healthy 2.0" (Kinder gesund bewegen 2.0) is Austria's largest sport and school programme (Fit Sport Austria, 2016[17]). Its aim is to build co-operation between sports clubs and primary schools to provide children with the opportunity to take part in age-appropriate, diverse and joyful exercise programs free of charge. "Move children healthy 2.0" also targets educators, teachers and parents in recognition of their significant influence on the activity level and behaviour of children. The initiative started in 2009 under the name "Move children healthy" (Kinder gesund bewegen) and is implemented by the three Sports for All organisations (ASKÖ, ASVÖ and SPORTUNION) through local sport clubs. It is co-ordinated by the non-profit organisation Fit Sport Austria and funded by the Austrian Federal Ministry for Arts, Culture, the Civil Service and Sport.

Lithuania: Physical activity after school provided by the informal education financing system

Physical activity after school is provided by the informal education financing system, whereby allocations are distributed from the national budget to municipalities according to the number of schoolchildren. Informal programmes are offered by sports clubs, free-lance teachers, municipal sport centres and others. Municipal budgets also provide for sports services and activities for children (WHO, 2021[11]).

Estonia: Schools in Motion

The Schools in Motion programme in Estonia takes a whole-school approach, covering physical education, active recess, active lessons and active transport to and from school (Mooses et al., 2021[18]). Participating schools are supported through seminars, workshops and skills training, and have access to easy-to-use materials and research, for example tips on how to make the indoor and outdoor environment more physical activity friendly, and techniques for reducing sedentary time during classes. Using these resources, each school can develop their own action plan. In 2021, there were 148 participating schools (28% of all general education schools) with more than 63 000 students (WHO, 2021[11]).

Belgium: Financial aid for after-school activities

In Belgium, the Agency for Infrastructure in Education (AGION) and Sport Vlaanderen provide subsidies to open sports and physical activity infrastructure after school. Schools can apply for a grant of up to EUR 140 000 for secondary education and up to EUR 160 000 for preschool and primary education (AGION, 2021[19]).

Poland: Student Sports Club Programme

The Student Sports Club Programme is a nationwide programme aimed at promoting physical activity among primary and secondary school students. It has been run by the Ministry of Sport and Tourism since 2017, and systematically organises extra-curricular sports activities conducted by physical education teachers in schools. Students participate in 60 minutes of activities twice a week in various sports. Every year, over 330 000 students and more than 14 000 teachers participate in the programme. In 2020, the Student Sports Club activities were held in almost 9 000 schools in all regions of Poland.

Workplace-based programmes

As many adults spend a large portion of their lives in the office, workplace-based actions are increasingly considered as an effective tool to influence lifestyle (OECD, 2019[20]). Actions can target behaviour in the workplace, such as reducing sedentary behaviour by encouraging walking breaks and stair use, or focus on transport to and from the office (Box 4.4). In 2021, 20 out of 27 EU Member States had national guidance or a programme to promote physical activity in the workplace, and 17 had national guidance or a programme to promote active travel to work (WHO, 2021[11]).

Interventions to reduce sedentary behaviour are of particular importance for desk-based work environments, where employees spend a large part of their day being sedentary. These interventions can be educational strategies, such as counselling, behavioural strategies, like point-of-decision prompts to take the stairs, or environmental strategies, such as standing desks (Chu et al., 2016[21]).

Previous OECD modelling estimated that implementing programmes to combat workplace sedentary behaviour in 36 countries could prevent 232 000 cases of cardiovascular disease and 222 000 cases of diabetes over 2020-50, and increase GDP by 0.015% (OECD, 2019[20]). Moreover, due to the positive impact on health care expenditure, workforce size and productivity, for every EUR 1 invested in workplace sedentary behaviour programmes, EUR 4.1 is returned in economic benefits.

Box 4.4. Active travel to work programme

Ireland: Smarter Travel Workplaces and Smarter Travel Campus

The National Transport Authority operates the Smarter Travel Workplaces and Smarter Travel Campus behavioural change programmes on behalf of the Department of Transport, Tourism and Sport. The Workplaces and Campus programmes work with large employers and third level educational institutions to encourage more sustainable commuting and travel choices amongst their students and staff.

The Smarter Travel Workplaces programme helps companies promote walking, cycling, public transport, car sharing, the use of technology instead of travel, and flexible working practices. It offers promotional materials, such as posters on the benefits of walking; guides and other information, for example on how to set up a company-wide carpooling system or on developing a Workplace Travel Plan; and awards to successful examples. Larger companies can qualify for an online employee travel survey, analysis with a suggested Action Plan (National Transport Authority, n.d.[22]).

Bulgaria: Chair Up

Chair Up is a programme that helps people whose jobs involve sitting for long periods. The programme recommends workouts, physiotherapy and yoga therapy as well as remedial exercises that can be done in the office and at home. Monthly thematic programmes are proposed, as well as one-off training sessions on diverse topics. The general goals are to introduce a healthy, active lifestyle to people working in offices and at home; improve the health of employees; increase employee concentration, stress resistance and overall work efficiency; and raise the general awareness about sedentary behaviour. The Chair Up programme has already been implemented in companies, institutions and business centres reaching a total of more than 12 000 employees (Chair UP, 2020[23]).

Interventions in the health care sector

Health care professionals are well placed to provide advice on physical activity and its health benefits, as their opinion is generally respected and they come into contact with a large proportion of the population – including high-risk groups. Such advice can take the form of general behavioural counselling, or more formal prescribing of physical activity (OECD, 2019[20])(Box 4.5). In the EU, 18 out of 27 EU Member States had national guidance or a programme to promote counselling on physical activity or exercise prescription by health professionals in 2021 (WHO, 2021[11]).

The basic model of physical activity on prescription (PAP) programmes includes a personalised written prescription detailing the type, amount and intensity of physical activity. This prescription is takes into account the person's health status, motivation and preferences. However, the design of PAP programmes varies across countries and regions: prescriptions can be written by GPs, nurses or other health professionals; the prescribed physical activity can be facility or home-based; and the programme duration differs (OECD, 2019[20]). Importantly, frequent meetings as well as subsidised or free access to sports facilities or exercise classes can improve the effectiveness of the programme, but also increases the cost.

Previous OECD modelling estimated that implementing PAP in 36 countries would prevent 236 000 cases of cardiovascular disease and 96 000 cases of diabetes over 2020-50 and increase GDP by 0.006% (OECD, 2019[20]). Moreover, for every EUR 1 invested in prescription of physical activity programmes, EUR 0.9 is returned in economic benefits – on top of the health and well-being benefits.

Box 4.5. Physical activity interventions in the health care sector

France: Sports – health houses

Sports – health houses (maisons sport-santé) were initiated by the ministries responsible for sports and health in 2019. There are currently 288 such centres throughout the country, and the goal is to have 500 by 2022. They may be hosted by public (e.g. hospitals, local authorities) or private structures (e.g. associations, sports and health networks). They organise information and awareness sessions and provide guidance and personalised support from health and sports professionals for sustainable practice of physical activity and sport, particularly for people who require adapted physical activity prescribed by a doctor, people with chronic diseases for whom physical activity is recommended and citizens in good health who want support to return to a physically active lifestyle (Ministère chargé des Sports, 2021[24]).

Netherlands: Combined lifestyle intervention

Since 2019, a combined lifestyle intervention has been included under the basic health insurance coverage in the Netherlands. It includes exercise on prescription for patients who have a body mass index ≥ 25 kg/m2 and another risk factor (e.g. risk factors for cardiovascular disease, type-2 diabetes) or a body mass index ≥ 30 kg/m2. General practitioners and specialists in primary health care refer patients to one of the qualifying combined lifestyle intervention programmes, which are provided by lifestyle coaches, dieticians, physiotherapists or exercise therapists. Participants receive diet and physical activity advice, as well as structured exercise classes, over a two-year period (RIVM, n.d.[25]).

Sweden: Prescribing of physical activity

Sweden has used the physical activity on prescription (PAP) intervention for 20 years, to address low levels of physical activity in the adult population (Onerup et al., 2019[26]). As part of the European Commission-funded EUPAP programme, the intervention is now being transferred to nine other EU Member States (EUPAP.org, n.d.[27]).

At the centre of the intervention is person-centred individualised counselling through a written prescription. This prescription notes the recommended type and dose of physical activity, possible contraindications and a plan for follow-up. To ensure that the prescription responds to the health needs of the individual, a handbook is available to prescribers which details evidence-based recommendations by disease. During a follow-up meeting the prescription can be adjusted. The patient can be referred to structured exercise through a community-based network of activity organisers, such as nongovernmental organisations, public or private facilities, but this handled and paid for by the patient, outside the health care system.

An OECD review of the PAP programme commended its strong evidence base and ongoing research on effectiveness. However, the uptake of the programme is limited compared to the size of the potential eligible population, and varies widely by region (OECD, 2022[28]).

Interventions in the sports sector

Sports facilities can play a major role in enabling and encouraging physical activity in the population (Box 4.6). Increasing public spending on recreational and sports services can increase the physical activity level for the population. OECD modelling estimates that, for Italy, an additional 1% investment could avoid more than 800 cases of cardiovascular disease annually, and it would be highly cost-effective (less than EUR 30 000 per DALY) as early as five years after the beginning of the intervention (Goryakin et al., 2019[29]).

Availability of and access to sports facilities is an important drivers of physical activity: 82% of people who exercise or play sports regularly say that they have many opportunities to do so in their local area, compared to 66% of people who never exercise (European Commission, 2018[30]). Opportunity is linked to socio-economic factors, as 79% of people who pay their bills without difficulty agree that they have sufficient opportunities in their area, but this falls to 59% among people who have difficulties paying bills most of the time. To ensure equitable access to sports facilities, such as sport pitches or gyms, they need to be available in the community, for people of all ages and abilities, at an accessible price.

Box 4.6. Programmes on physical activity in the sports sector

Europe: "Sports clubs for health" programme

In addition to providing the opportunity to engage in sports, sports clubs can also take an active role in encouraging physical activity. The "Sports clubs for health" (SCforH) programme was designed to help sports clubs deliver programmes with a stronger focus on health and to encourage health-related activities. Instead of focusing on competition, Sports Clubs for Health emphasise recreational sports and increasing physical activity through sports.

Promoting physical activity within a sports club can be done by introducing new exercise methods, improving facilities, or developing tailored programmes for a specific target group (e.g. elderly people, newcomers or women). However, rather than an independent initiative, the aim is to integrate the SCforH approach into all the club's activities. This includes restrictions on advertising of unhealthy food and drinks, health education, and coaches setting the right example with a healthy lifestyle.

Guidelines for the SCforH programmes have been prepared by a working group of Health-enhancing physical activity (HEPA) Europe and the Association for International Sport for All, supported by funding from the European Commission. They guide clubs through a Plan-Do-Check-Act process to develop their own SCforH initiative. They can be applied to any kind of sports club, regardless of the sports offered, size, whether it is voluntary or professional, or the age groups served (WHO, 2021[11]; Koski et al., 2017[31]).

Denmark: Get2Sport programme

The project Get2Sport under the Ministry of Immigration and Integration and the Sports Confederation of Denmark was started in 2005 with the aim of providing opportunities for children and young people in underprivileged areas to participate in sports, primarily football, in local clubs. The programme provides funding to hire employees for administrative task, to allow volunteers to focus on coaching and other sports-related functions. It can also provide support for other practical and resource challenges, such as transport to a match. In 2019, Get2Sport supported 55 associations in 43 vulnerable housing areas, located in 22 different municipalities (Danmarks Idrætsforbund, n.d.[32]).

Urban design, environment and transport policies

Physical activity is not just structured exercise and sport, but includes activities such as outdoor playing, recreational hiking and cycling to work. Urban design and the environment can facilitate these forms of physical activity by providing safe and pleasant spaces to move. Environmental policies to encourage physical activity can include regulation to improve road safety, urban planning requirements to increase parks, trails and other green spaces, and investments in dedicated cycling and walking lanes and other infrastructure.

One example is investing in public transport. Building new public transit options is estimated to increase the light to moderate physical activity of users by about 30 minutes per week, as people walk or cycle to transit stops (Xiao, Goryakin and Cecchini, 2019[33]). OECD modelling has shown that, on a population level, this can prevent 121 000 cases of cardiovascular disease and 37 000 cases of diabetes over the next 30 years across 36 countries, and raise GDP by 0.004% (OECD, 2019[20]). Transport policies can also focus on cycling (Box 4.7) and walking as active modes of transport.

Box 4.7. Programmes to encourage cycling

Luxembourg: Bicycle Summer

Vëlosummer (Bicycle Summer) is a co-operative initiative between the Ministry of Mobility and Public Works, the General Directorate of Tourism and several municipalities. Certain roads were closed to motorised vehicles in the summer of 2020, and six routes were signposted, creating 550 km of additional cycle routes for 30 days. Cameras and road sensors were used to estimate that 40 000 cyclists took part in this "soft mobility-promoting" initiative. As a result of the successful 2020 edition, the number of collaborating municipalities tripled and the number of routes on offer doubled, so that over 600 km of cycling opportunities in Luxembourg were provided in 2021. Bicycle summer 2021 is expected to have encouraged more participants and cycling perspectives for the next edition 2022 (Visit Luxembourg, 2021[34]).

Germany: D-Netz cycle network

Originally started as a "D-Netz", the German cycle network (Radnetz Deutschland) is an integral part of the measures of the Federal Government's National cycling plan. In the network, Federal and state governments are committed to common standards and high-quality cycling tourism. The network, funded with EUR 45 million until 2023, consists of 12 long-distance cycle routes, the "German Unity Cycle Route" and the EuroVelo route "Iron Curtain Trail". This network allows people to plan and experience a bike trip on safe, comfortable, relaxing routes by combining several thematic bike routes connecting all the regions of Germany (WHO, 2021[11]).

Design guidelines can help local governments and developers to create spaces that enable and encourage physical activity. The IMPALA guidelines were developed in Europe to support the development and improvement of infrastructure for physical activity (see Box 4.8). In 2021, only five out of 27 EU Member States reported that they applied the IMPALA guidelines systematically (WHO, 2021[11]). However, another 13 countries reported that they used similar national guidance or programmes.

Box 4.8. Urban design for physical activity

Europe: IMPALA guidelines

The Improving Infrastructures for Leisure-time Physical Activity in the Local Arena (IMPALA) guidelines were developed through a collaboration of scientists and policy makers from 12 EU Member States, with funding from the European Commission. They consider three types of infrastructure: sports facilities, leisure time infrastructure (e.g. playgrounds, bike paths) and urban "green" and "blue" spaces (e.g. forests, beaches).

The guidelines identify ways in which infrastructure for leisure-time physical activity can be assessed and improved with a focus on social equity, inter-sectoral collaboration and participation. They are set across five key areas: policy making, planning, building, financing, and management. For example, for planning the guidelines provide advice on how to plan specific actions together with all relevant groups and stakeholders. Under financing, an overview is provided with the impact of different investor models, subsidies and funding procedures on equity issues as well as on collaboration between different policy sectors and levels. In Italy, the guidelines are included in general ministerial information kits and infographics (WHO, 2021[11]; IMPALA, 2011[35]).

Croatia: Healthy Living programme

The Healthy Living programme, managed by the Croatian Institute of Public Health, aims to improve the health of the population by reducing the negative impact of behavioural, biomedical and socio-medical risk factors and creating an environment in which all persons in Croatia are provided with the highest level of health and quality of life. One of the initiatives under the programme is the development of trails and parks in all 21 counties, to encourage physical activity. The design and equipment for these "exemplary parks" was created by a multidisciplinary collaboration among eight schools of the University of Zagreb (School of Medicine, School of Education and Rehabilitation Sciences, School of Kinesiology, School of Architecture, School of Design, School of Agriculture, School of Engineering and the Arts Academy). The project has been chosen for the Rector's award for socially useful work (Zivjeti Zdravo, 2021[36]).

Information and communication policies

The first action of the WHO *Global action plan on physical activity 2018-30* (WHO, 2018[37]) is to implement communication campaigns to increase awareness, knowledge and understanding of, and appreciation for, the multiple health benefits of regular physical activity. However, the messaging should not be limited to the health benefits, but also highlight the social, economic, and environmental co-benefits. Moreover, messaging should be inclusive, with images tailored to the diversity of communities (WHO, 2021[38]).

In 2021, 23 out of 27 EU Member States reported to have clearly formulated national campaigns for education and public awareness about physical activity (WHO, 2021[11]). While television, radio and newspapers remain commonly used media, 21 countries also reported using social media. However, while public awareness campaigns are an important part of any physical activity strategy, there are other information policies that can help promote physical activity, such as apps to locate resources (Box 4.9).

Box 4.9. Information and communication policies for physical activity

Spain: Localiza Salud

Localiza Salud is an online application that provides information about the availability of resources and activities in municipalities that contribute to health and well-being. All municipalities are invited to participate and map their resource to improve the lifestyles of their population. The strategy is used by 360 local entities, and more than 17 000 health-promoting resources have been published in the Localiza Salud application (Ministry of Health, 2021[39]).

Ireland: Campaigns in the context of COVID-19

During the COVID-19 pandemic, ongoing Healthy Ireland public information campaigns were re-purposed under the "In this Together" and "Keep Well" campaigns. These campaigns highlighted physical activity and individual sports that could be maintained in the context of necessary COVID-19 restrictions (e.g. exercise at home, online classes, walking, running, cycling, outdoor swimming if living near the sea/lakes). In late 2021, Sport Ireland and Healthy Ireland worked in partnership on the "Let's Get Back" campaign, which encouraged a return to organised sport following the successful national vaccination campaign.

A comprehensive, well-funded package of policies is needed to get people moving

While all policies have their own benefits, it is unlikely that any single policy will have a major impact on physical activity levels in the population. Physical activity is a complex behaviour, which is influenced by many different factors, including personal variables such as motivation and physical ability; environmental factors such as schools, worksites, and other places where people spend most of their time; community characteristics determining the opportunity to exercise, as well as social factors such as peer pressure and public information (Bauman et al., 2012[40]). To increase physical activity, a comprehensive package of policies is needed to target all of these factors at the same time.

Previous OECD modelling work has shown how a physical activity policy package including interventions such as prescribing physical activity, investing in active transport and school-based programmes can lead to significant health gains and savings in health care expenditure. Such a package of policies aimed at increasing physical activity, implemented in 36 countries, would prevent 38 000 NCDs per year and save around EUR 14 billion in health cost by 2050 – equivalent to the total annual health care expenditure of Greece. Moreover, for every EUR 1 invested in a physical activity policy package, EUR 1.7 are returned in economic benefits (OECD, 2019[20]).

As with any public health strategy, it is crucial to ensure that the policy package has both financial and political support. Current funding for physical activity is often insufficient, short term, narrow in scope, and focussed on pilot and demonstration projects instead of strengthening a supportive system. Policy makers should set up sustainable and long-term funding (Box 4.10) (WHO, 2021[38]).

Box 4.10. Financing physical activity programmes

Germany: Preventive Health Care Act

The Preventive Health Care Act (Präventionsgesetz) was adopted in 2015 and aims to improve health promotion and prevention in Germany. The adoption of the law needs to be seen in the context of a federal health insurance system that relies heavily on statutory health insurances, which cover the costs of a broad range of health care services for large parts of the population. From an international perspective, the German health care system has traditionally had a strong focus on curative aspects while the role of prevention has been rather minor. Additionally, there is a high degree of governmental oversight of all aspects of the system.

Against this backdrop, the act has strengthened the role of prevention in the German health care system, including physical activity promotion. Firstly, new structures and institutions were created to improve the co-operation between important stakeholders, most importantly the National Preventive Conference (Nationale Präventionskonferenz). Secondly, a new mandatory Prevention Guideline (Leitfaden Prävention) for the German statutory health insurances defines physical activity promotion as an important action area for prevention measures. Statutory health insurances are obliged to invest at least EUR 7 annually per insured person in health promotion and prevention, resulting in a total of approximately EUR 500 million Out of this, at least EUR 300 million need to be invested in settings such as childcare, schools, communities, workplaces and nursing care. Thanks to the Preventive Health Care Act, total investment for health promotion and prevention has increased by around 40%, from EUR 1.3 billion in 2012 to EUR 1.8 EURO in 2017.

Overall, the Preventive Health Care Act is a comprehensive strategy that creates new opportunities for physical activity promotion, with substantial funds being allocated to this field. This includes funding for scientifically evaluated projects led or supported by researchers. It has been reported that the creation of new prevention structures is considered as very positive, even though co-operation between organisations could still be improved (e.g. with regards to a patchwork of projects which is yet to turn into a comprehensive network for prevention).

Source: Bundeszentrale für gesundheitliche Aufklärung (2021[41]), Präventionsgesetz, https://leitbegriffe.bzga.de/alphabetisches-verzeichnis/praeventionsgesetz/.

Moreover, while multicomponent, multilevel strategies are notoriously difficult to study, a comprehensive evaluation should be conducted to help understand whether the strategy works, what other impact it has, its value relative to the resources required to deliver it, how it interacts with the context in which it is implemented, and how it contributes to system change (Skivington et al., 2021[42]). An efficient data management and data linkage system to collect timely and accurate data can support evulation studies (Box 4.11).

Box 4.11. Collecting continuous data on physical activity

Italy: PASSI

PASSI (Progressi delle Aziende Sanitarie per la Salute in Italia – Progress by local health units towards a healthier Italy) is a public health surveillance study based on continuous collection of information on lifestyles and behavioural risk factors related to non-communicable diseases among the Italian adult population. It was started in 2007 and is used to evaluate public health policy, such as the National Prevention Plan. Among other risk factors, PASSI collects information on both physical activity levels and active mobility (the use of cycling or walking to go to work, school or other usual trips).

Rather than one annual cross-sectional survey, the PASSI survey is based on a monthly random sample of people aged 18-69 years, stratified by sex and age groups, from each local health unit, to allow continuous monitoring. It is designed in such a way that the monthly samples can be used to calculate accurate annual estimates. Each year the national sample consists of about 35 000 interviews.

Source: EpiCentro (2021[43]), PASSI, https://www.epicentro.iss.it/passi/.

The task at hand is clear: make physical activity a public health priority to improve health and reduce the burden of non-communicable diseases. However, to achieve such a goal, much work remains. Rather than falling under strategies for other risk factors, physical inactivity should be a separate and equal concern, and should be recognised as a unique specialty. A strong policy framework, consistent investment in physical activity programs and infrastructure, multi-sectoral support, high population reach, and good surveillance should characterise each future action (Pratt et al., 2015[44]). Adaptation of the evidence-based strategies to community need, culture, and context is critical. An isolated public health strategy for physical activity is unlikely to be successful as many of the necessary actions occur in sectors other than public health and because sustained funding is nearly impossible without the broader political support associated with strong partners.

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Glossary

Active is doing at least the equivalent of 150 minutes to 300 minutes of moderate-intensity physical activity a week. This level meets the WHO guidelines for adults.

Health-enhancing physical activity (HEPA) is any form of physical activity that benefits health and functional capacity without undue harm or risk.

Highly active is doing the equivalent of more than 300 minutes of moderate-intensity physical activity a week. This level exceeds the WHO guidelines for adults.

Inactive is not getting any moderate- or vigorous intensity physical activity beyond basic movement from daily life activities.

Insufficiently active is doing less than the equivalent of 150 minutes of moderate-intensity physical activity a week. This level is less than the WHO guidelines for adults.

Metabolic equivalent of task (MET) is a measure to reflect the intensity of physical activities, and allows comparison between them. One MET is the energy equivalent expended per unit of time by an individual while seated at rest. More intense activities, which cost more energy expenditure than being seated at rest, are attributed higher METs:

> **Light-intensity physical activity (LPA)** is between 1.5 and less than 3 METs. This includes slow walking, bathing, or other incidental activities that do not result in a substantial increase in heart rate or breathing rate.
>
> **Moderate-intensity physical activity (MPA)** is between 3 and less than 6 METs. This includes activities such as gardening, dancing or brisk walking.
>
> **Vigorous-intensity physical activity (VPA)** is 6 or more METs. This includes activities such as fast swimming or running.

MET-minutes is a useful tool for tracking physical activity in more detail than by simply using the number of minutes. This is particularly helpful if people do different activities at different levels of intensity over the course of the week. It is calculated by the intensity of activity (in MET) multiplied by the duration of activity (in minutes). For instance, running 10 km per hour (6 minutes per km) is roughly equivalent with a value of 10 METs. If someone ran for 30 minutes at this pace, then they would do 10 x 30 = 300 MET-minutes.

Sedentary behaviour is any behaviour during waking hours characterised by a low level of energy expenditure (i.e. 1.5 METs or lower) while sitting, reclining or lying.

Step Up! Tackling the Burden of Insufficient Physical Activity in Europe

This report calls on policy makers to step up the policy response to increase physical activity. Being physically active is one of the most important things people can do to improve their physical and mental health. It helps prevent a range of non-communicable diseases such as cardiovascular disease and cancer, and improves mental health and cognitive functioning, among other benefits. Nevertheless, too many Europeans are physically inactive. One in three European adults do not meet the WHO physical activity guidelines, and almost half never exercise or play sport. The report describes patterns and trends of insufficient physical activity in Europe. It reviews the detrimental impact that current physical inactivity levels have on population health and health expenditure. The report provides policy makers with options to address insufficient physical activity, drawing on case studies from across Europe.

This document was produced with the financial assistance of the European Union. The views expressed herein can in no way be taken to reflect the official opinion of the European Union.

PRINT ISBN 978-92-64-78810-7
PDF ISBN 978-92-64-41030-5