



# The economic cost of physical inactivity in Europe

An ISCA / Cebr report  
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# Foreword and introduction from Mogens Kirkeby

## President, International Sport and Culture Association (ISCA)

Within a few decades, physical inactivity has become one of the leading risks to European citizens' wellbeing and a growing challenge for European societies. Despite these dramatic facts, we still lack sufficient initiatives to reverse this negative trend.

At ISCA we are dedicated to getting people moving more not only in Europe, but worldwide. This commitment is because we believe that all citizens have the right to enjoy the physical, mental and social benefits of a physically active lifestyle. And that is why our slogan is Moving People.

Physical activity promotion relies on a multi-sector approach and on effective initiatives that can assist communities and individual citizens in engaging in an active lifestyle.

In our cross-sector partnerships, which all aim to increase physical activity levels in Europe, we assist civil society organisations in establishing local initiatives that support active lifestyles and strive to push physical activity higher on national and European political agendas. As part of this strategy we have commissioned a piece of research to assess the physical and mental health costs of inactivity for Europe based on data from six countries: France, Germany, Italy, Poland, Spain, and the UK. It is our hope that this research will present a clearer picture of the challenges we need to overcome.

We strongly believe it is time to respond to and act on our knowledge of physical inactivity as a pressing social issue in Europe. It is high time to defuse the inactivity time bomb and get Europe moving again.

We hope that this report can assist you in your work and we would be happy to collaborate with you on the common goal to significantly increase how much we all move and to give the many physical, mental and social benefits of a physically active lifestyle back to European citizens.



# Input and support for the report and its findings

As part of the process of writing this report, ISCA brought together a group of stakeholders for a roundtable discussion on 21<sup>st</sup> April in Brussels to discuss its findings, what it means for Europe and what we need to do differently to address this growing societal issue. We would like to thank all these organisations for their support and input to the project and their continued commitment to getting Europe more active.



*“At ECF we work to ensure that cycling (and walking) are part of everyday travel and leisure, so we welcome every piece of evidence that sends a message to decision-makers about the impact of inactivity. This report helps show that this is a policy problem for the whole of society, we must create environments that encourage and support physical activity where people live and work.”* Kevin Mayne, Development Director, European Cyclists' Federation



*“Every move counts. This report emphasises the need for concrete action to get people to move in their daily life. At EPODE International Network, we change children, adolescents and families' behaviour towards a more active lifestyle for the long term. We work with local politicians to change the physical and social environment of the communities. We must act together in order to change the norm: physical activity is easy, fun and within reach!”* Jean-Michel Borys, President, EPODE



*“Sedentary lifestyle has an impact on health and can prompt negative changes in European societies. Promoting physical activity, sports and exercise throughout Europe requires new efforts. The necessity of implementing exercise-oriented concepts in medicine and society as a whole is essential. Traditional concepts of technology and medication-driven medical practice have limited effects on life expectancy and health, and can result in an improper allocation of financial resources. It can also prevent patients who really need surgery and other invasive medical techniques from obtaining adequate treatment. The solution should not be to allocate more money to invasive or surgical procedures, but to new ways of informing people about prevention and exercise, changing their environments to enable physical activity, and nurturing the cooperation between medical doctors and the sports system.”* Jürgen Michael Steinacker, Prof. Dr. med. Dr. h.c., European Initiative for Exercise in Medicine



# Input and support for the report and its findings cont.



*“This report is a comprehensive addition to the increasing volume of research highlighting the risks of inactivity on individual's health and performance. There has never been a more critical time for employers around the globe who are searching for competitive advantage to recognise the connection between employees' sedentary lifestyles and their business contribution. Those businesses that don't recognise this will quickly be left behind in the race.”*  
Tom Sermon, Chief Executive Officer, Global Corporate Challenge



*“The numbers are frightening, but the worst thing about them is that they are totally avoidable. We just need to be a bit more active. But to make this happen we need to work together to encourage everyone, especially today's kids, to be more active. There is no simple single solution. If we all take some responsibility we can make this happen. We can, and need to, improve the lives of our children by getting them into physically active habits early.”*  
Baroness Tanni Grey-Thompson, DBE, Laureus Academy Member



*“Finding time for physical activity does not only lead to several important mental benefits, but it actually helps to prevent a series of mental health problems and can, most importantly, contribute to the recovery process of persons who struggle with mental ill health.”* Maria Nyman, Director, Mental Health Europe



*“This report by ISCA and Cebr backs up our own findings. People with intellectual disabilities experience chronic health problems due to insufficient care, poor nutrition and inactive lifestyles. In virtually all countries in which Special Olympics operates, we started there because there were either no or limited options for people with intellectual disabilities to be physically active. Through sport we can empower people with and without intellectual disabilities to live healthier lives whilst being accepted and valued members of their communities. This fosters a more respectful and inclusive society for all.”* Mary Davis, Regional President and Managing Director Special Olympics Europe Eurasia

Further roundtable contributors:



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# Inactivity costs the European economy over €80 billion per year

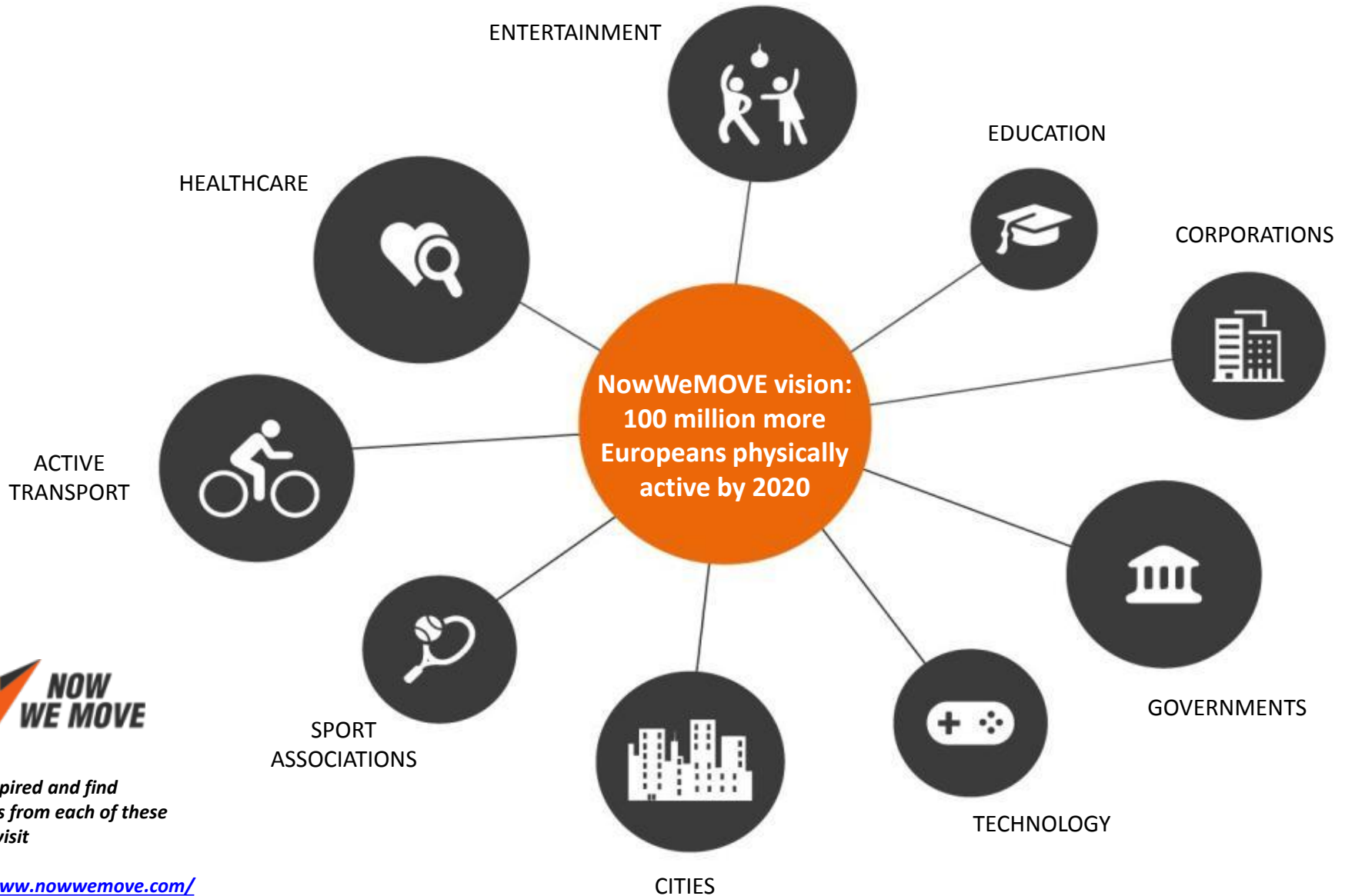
- The WHO estimates that a **quarter of European adults**, and **four-fifths of European adolescents**, are insufficiently active. This means that they do not regularly engage in the recommended levels of physical activity. In some respects, these levels of inactivity are an achievement of modern engineering and invention: technology has given rise to a lower proportion of labour-intensive jobs, and progressively removed the requirement for physical labour from many of our daily tasks.
- However, the health consequences of sedentary lifestyles are significant, and dangerous. Even individuals of normal weight who do not reach the recommended levels of physical activity are at significantly increased risk of developing cancer, type II diabetes, heart disease and suffering from premature death. Indeed, inactivity is the **fourth-leading risk factor for all global deaths**.
- Across Europe, inactivity's contribution to all-cause mortality amounts to **over 500,000 deaths per year** – deaths which could be averted through enabling and encouraging all Europeans to engage in lifestyles that achieve the recommended levels of physical activity. Even if these recommendations are not fully met, important health benefits can still be unlocked with comparatively smaller levels of activity – the initial step from a sedentary life to some degree of activity is crucial. This is especially true for young people: activity in childhood is a significant determinant of future activity levels, and thus influences health outcomes throughout life.
- Inactivity imposes **economic costs of €80.4 billion per year to the EU-28** through four major non-communicable diseases (coronary heart disease, type II diabetes, colorectal and breast cancer), and through the indirect costs of inactivity-related mood and anxiety disorders. This is equivalent to 6.2% of all European health spending; €5 billion more than the entire world spends on cancer drugs each year; or half the annual GDP of Ireland or Portugal. Looking ahead, this economic cost burden is set to rise – we conservatively estimate that 2030 could see annual costs of over €125 billion (in 2012 prices).
- These costs could be avoided if all Europeans were to achieve an average of 20 minutes per day of simple and inexpensive activities such as walking or running. Even interventions to bring just one-fifth of currently inactive Europeans up to the recommended levels of regular activity **would yield benefits worth up to €16.1 billion**.
- Within European nations, lower-income demographics tend to undertake physical activity less regularly than their counterparts from more affluent segments of society. This suggests that the negative health consequences of inactivity are borne disproportionately by **more disadvantaged or marginalised groups**. This highlights the fact that interventions to promote and encourage more active lifestyles and routines can contribute substantially to addressing health inequalities.
- Against this background, it can be clearly seen that physical inactivity is a **serious public health challenge**, deserving of immediate action. Due to the severe negative consequences of sedentary lifestyles, and the lack of widespread understanding of the risks, it has been said that 'sitting is the new smoking'. This report draws together a range of existing evidence, research and data sources to examine the economic dimensions of the issue, and underline the urgency with which this problem should be tackled.

# There are steps we can all take to help defuse Europe's physical inactivity time bomb

Here we share just a few of the points that were identified through this research process as clear and tangible actions that can be taken as steps to help address this growing and costly societal issue:

- **Share and celebrate success:** There are a lot of inexpensive and effective physical activity programmes that are getting people more active across Europe. We need to share the success of these programmes and celebrate the impact they are already having.
- **Ensure physical activity is a positive experience (especially for children) and easy to do:** By ensuring physical activity is a positive experience and one that can be integrated into your daily life we make it a desirable activity rather than a burden. By focusing on children we can make sure they are set up for life with positive behaviour that will help them in later life.
- **Create new and innovative partnerships:** The rise of physical inactivity cannot be solely addressed by individual efforts. We need to work together in multiple areas to tackle the challenge. We need to identify new and innovative partnerships that reach beyond the physical activity sector. What partnerships can be created that bring together organisations and people from diverse fields such as the built environment, education, or transport?
- **It's a national issue, but local solutions are key:** While it is vital that there are the right structures put in place by politicians at a national level, we must also identify and support local solutions to ensure we have a long-term sustainable impact.
- **Recognise the broader impact of physical activity:** Physical activity is not just about being physically healthier. Physical activity and sport can play a significant role in the mental wellbeing of an individual, help develop an individual's character, bring networks of people together, help people learn new skills, and can improve people's productivity and performance. We need to promote its broader impact.
- **Seed positive messages about physical activity through all walks of life:** Several actors with key roles in or direct contact with the public can embed positive messages about being more active into more walks of life. From doctors and teachers to artists and city planners – we need to make the positive messages about physical activity everyone's business.

# And to succeed we need to have cross-sector solutions



*To be inspired and find examples from each of these sectors, visit*

<http://www.nowwemove.com/>



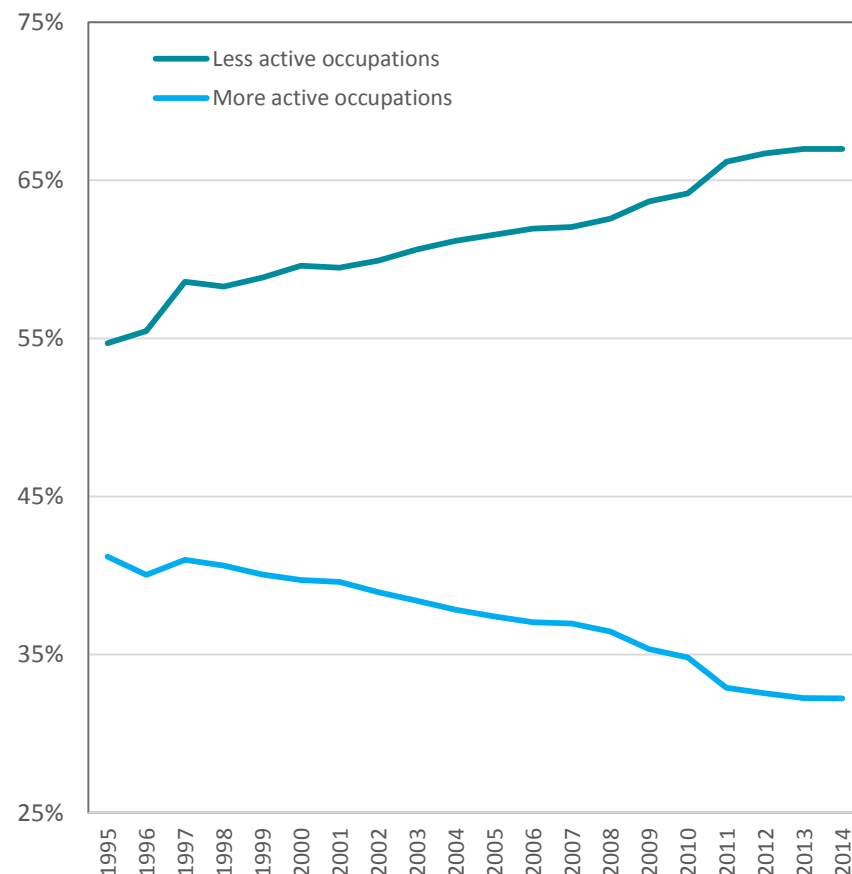
# Physical inactivity in Europe



# Modern life enables increasingly sedentary lifestyles

- Physical activity has long been a prominent component of most aspects of human life. Throughout history, housekeeping and maintenance, manual labour and other types of work, farming, transportation and leisure all required varying degrees of exercise.
- Over recent decades, technological and engineering progress has reduced the physical labour input required to accomplish all kinds of tasks, both at work and in the home. This has successfully reduced the physical hardships faced by most people at their workplace, cutting work-related injuries and disabilities resulting repetitive physical labour (Hallal et al., 2012).
- The chart opposite sets out one aspect of this process, comparing the proportions of jobs in Europe which fall within occupations that are associated with more or less physical activity. In the two decades approaching 2014, the number of European jobs within more active occupations has fallen by 7 million; while the number of less active roles has risen by 43 million. This has led to the total proportion of less active roles in European employment growing from 55% to 67% over the same timeframe.
- While this represents just one domain of life in which Europeans are becoming less active (work), evidence suggests that activity levels are falling in many of the aspects mentioned above: including recreation, housekeeping and transport (WHO 2010). Freed from the demands of routine exercise, we lead increasingly sedentary lifestyles.
- But the human body has evolved in such a way that most of its systems (e.g. skeletal, muscle, metabolic and cardiovascular) do not develop and function optimally without frequent physical stimulation (Booth et al., 2008). As humans we are, in effect, 'designed' to be active creatures.
- But tackling the problem of physical inactivity does not require reverting back to working lives entailing strenuous or difficult manual labour. Moreover, it does not even necessitate extensive participation in organised sports, or other such structured activities. The key challenge is simply to enable individuals to replace those opportunities for energy expenditure which have been 'lost' to modernity. For example, simply endeavouring to walk more often and more briskly can provide important benefits for individual health and wellbeing.

Proportion of jobs in the EU-28 nations, by occupational category, 1995-2014



Source: Labour Force Survey, Cebr analysis

**Notes:** 'Less active occupations' includes managers, professionals, clerks, technicians, sales and service workers (ISCO categories 1-5). 'More active occupations' includes agricultural, construction, manufacturing, industry & labouring occupations (ISCO categories 6-9).

# But physical activity is essential for physical and mental health

- The WHO recommends that adults (18+) should undertake either:
  - **150 minutes per week** of moderate-intensity aerobic physical activity (equivalent to around 20 minutes per day), or
  - **75 minutes per week** of vigorous-intensity activity, or
  - an equivalent combination of moderate and vigorous activity.
  - additional health benefits are gained through increasing these durations to 300 and 150 minutes per week, respectively. For improving cardio-respiratory health, all activity should take place in durations of at least 10 minutes.
- Engaging in these levels of physical activity substantially reduces an individual's risk of developing one or more of the health problems or disorders set out opposite. This underlines the extensive benefits which physical activity can bring: in addition to promoting cardiovascular health, it is effective in treating or averting a broad range of serious non-communicable diseases, physical and mental health issues.
- To avert such negative health outcomes, the aforementioned recommendations encourage people to achieve certain levels of energy expenditure. But, since more vigorous exercise can greatly increase the rate of energy expenditure associated with a given activity, positive health outcomes could be achieved with relatively shorter periods of higher-intensity activity.
- Importantly, even **those moving from 'none' to 'some level' of activity see significant health benefits**. This suggests that the initial task of supporting someone with an inactive lifestyle to simply **undertake some degree of physical activity** unlocks a disproportionately large share of potential health improvements.
- In this way, all efforts to increase levels of physical activity can be seen as life-saving medical interventions, as well as investments in human health and potential. Physical activity delivers longer, happier and more productive lives, contributing positively to economic and social outcomes in numerous ways.

## Health benefits associated with physical activity

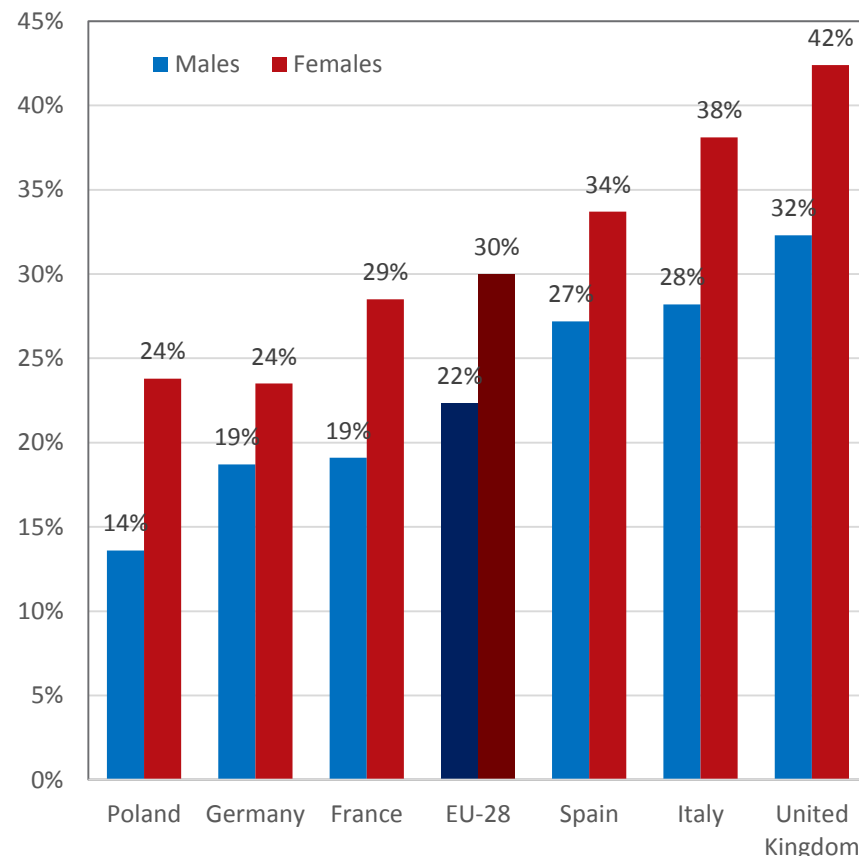
Condition	Effect
Heart disease	Reduced risk
Stroke	Reduced risk
Overweight and obesity	Reduced risk
Type II diabetes	Reduced risk
Colon cancer	Reduced risk
Breast cancer	Reduced risk
Musculoskeletal health	Improvement
Falls in older people	Reduced risk
Psychological wellbeing	Improvement
Depression	Reduced risk

Source: WHO (2006)

# A quarter of European adults are insufficiently active

- Despite all of the well-established health benefits linked to physical activity, a large proportion of the world's population remains physically inactive. Measured against the WHO guidelines, a quarter (26%) of adults across Europe are insufficiently active (WHO 2010).
- Of the six focus countries examined, the UK sees the highest prevalence of physical inactivity, with 37% of the adult population categorised as being insufficiently active. On the other side of the spectrum, Poland had the lowest prevalence of physical inactivity: over three-quarters (76%) of the adult population meet recommended weekly levels of exercise and activity.
- The reasons behind these cross-country variations are complex, and the causal relationships between activity and social and economic factors are an ongoing research area.
- However, broad trends can be identified: for example, WHO analysis shows that higher income countries (defined according to World Bank income groups) tend to see larger proportions of insufficiently active populations. This suggests that Poland's lower rates of inactivity (relative to the other five focus nations) may partially reflect its lower per-capita national income.
- Increasing urbanisation is correlated with decreasing physical activity, a trend which is consistent with the data opposite: the UK has the lowest share of rural population in its total (19%) – a proportion that is in stark contrast to Poland (39%). Moreover, employment structures and job markets play a role: over a third of Polish jobs (35%) are agricultural and industrial occupations, which is more than twice the equivalent proportion in the UK (15%).
- In all 6 countries examined, as well as Europe as a whole, women are less active than men. The largest disparities between men and women were found in Poland, Italy and the UK, where the proportion of insufficiently active adult women is 10 percentage points higher than the equivalent figure for adult men.

**Proportion of men and women (18+) who are insufficiently active, six focus countries and Europe, 2010**

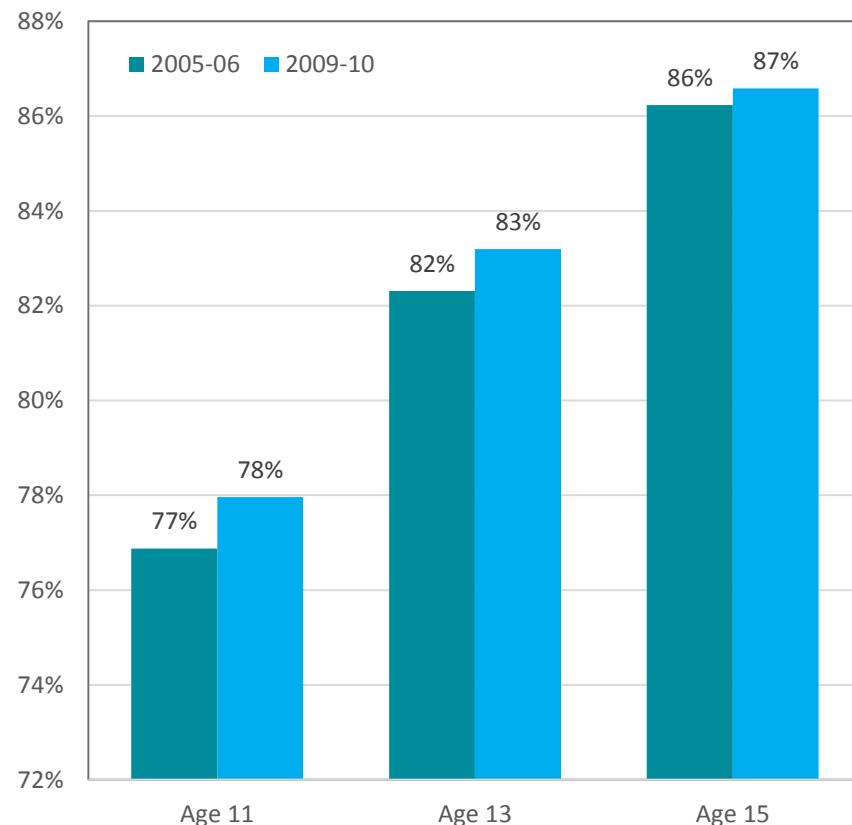


Source: WHO 2010, Cebr analysis. Data are age-standardised: see appendix for further detail.

# For adolescents, the picture is worse – four fifths are insufficiently active

- For children and young people, the recommended levels of physical activity are much higher than for adults: WHO guidelines recommend children aged 5-17 should spend at least **60 minutes daily doing moderate-to-vigorous intensity physical activity**, with more intensity and/or greater duration than this providing additional benefits.
- Worldwide, 80% of adolescents aged between 13-15 years do not achieve this target (Hallal et al, 2012). This proportion is even higher across the EU-28 – in which **83% of 11-15-year-olds** are estimated to be inactive.
- Against these guidelines, the proportions of physically inactive children and young people tend to rise with age, as illustrated in the chart opposite. These data, collected through the Health Behaviour in School-Aged Children (HBSC) survey, show that 15-year-olds are substantially less likely to meet the recommended levels of physical activity than children who are two or four years their junior. Evidence suggests that an increasing prominence of screen-based leisure time in young peoples' lives (e.g. TV, computer, phone, tablet) is taking its toll through increased sedentary behaviour.
- Boys are a tenth more likely to be physically active than girls in all countries examined, suggesting that the opportunities presented to young people for undertaking physical activities may be gender-biased (Currie et al., 2012).
- **Physical activity in childhood has been shown to be a significant determinant of activity levels and health outcomes in later life.** In light of this, supporting children and young people to establish active routines, habits and lifestyles is a crucial public health concern, and one which will help to curb the mounting economic costs of inactivity.

**Proportion of children in the EU-28 who are insufficiently active, 2005-06 and 2009-10**



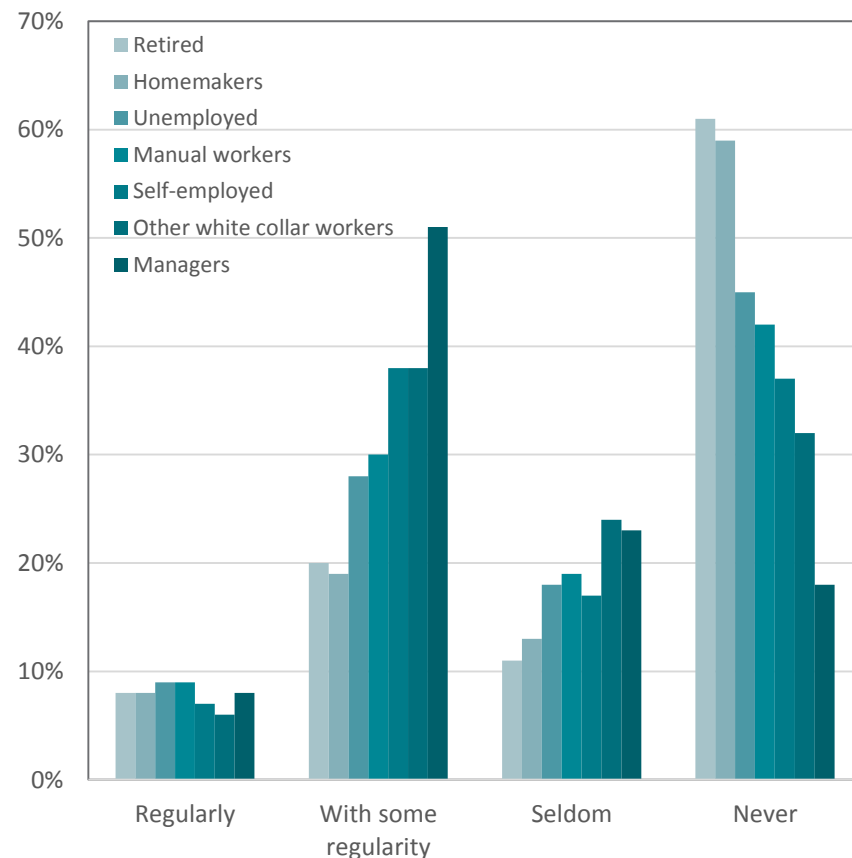
Source: Currie et al., (2008, 2012), Cebr analysis



# Activity levels tend to rise alongside socio-economic standing

- Examining the activity levels of individuals from different social or economic backgrounds can provide insights into how the inactivity burden weighs upon different segments of society. Eurobarometer research from 2013 (illustrated in the chart opposite) demonstrates that the frequency of an individual's engagement in sport or exercise can vary greatly, depending on the socio-professional category of that individual.
- The proportion of persons engaging in sport or exercise at least once a week (represented by the 'regular' and 'with some regularity' groups in the chart opposite) reached 58% for managers, 44% for other professional 'white collar' workers, and 45% of self-employed people. This proportion falls to 39% for manual workers, 37% for unemployed persons and 27% for homemakers. However, the proportion of persons engaging in sport or exercise regularly (at least five times a week) did not vary as much according to socio-professional categories.
- The same survey revealed similar patterns of engagement with sport or activity depending upon individuals' educational levels: 68% of people who left education by the age of 15 reported never exercising or playing sport, compared with 27% for those whose formal education continued past the age of 20.
- The reasons behind such socio-economic variation can be complex. Poorer people tend to have less free time available in which to engage in physical activity, as well as less access to affordable leisure facilities. Moreover, they may live in environments which are not as supportive of physical activity as their counterparts in more affluent demographics.
- These findings suggest that the benefits of regular physical activity are disproportionately enjoyed by more affluent socio-economic groups, while the negative health consequences of inactivity are concentrated among demographics of lower socio-economic standing. Interventions to encourage regular participation in sport or exercise can therefore help to reduce these health inequalities.

**Regularity of exercise or sport participation among citizens of the EU-28, by socio-professional category, 2013**



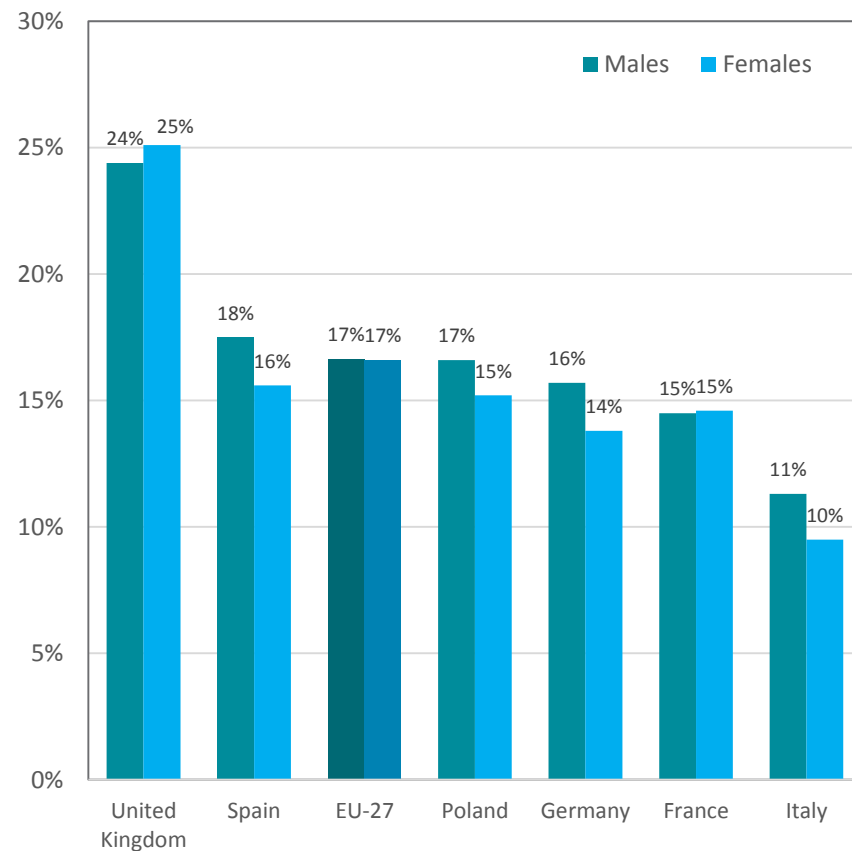
Source: Eurobarometer

**Notes:** 'Exercise or sport' is defined as any physical activity done in a sport or sport-like setting, e.g. swimming, training in a fitness club or sport club, running in the park, etc. 'Regularly' means at least 5 times a week; 'with some regularity' means 1-4 times per week; and 'seldom' means 3 times a month, or less often.

# Inactivity contributes to obesity, but has far-reaching impacts beyond weight

- Widespread awareness of obesity as a public health issue has emerged as obesity rates have surged over recent decades: the WHO estimates that the prevalence of obesity doubled between 1980 and 2008.
- Physical activity is closely related to overweight and obesity. These conditions can be broadly understood as the outcome of sustained increases in an individual's caloric intake (i.e., through food and drink), which are not matched by commensurate increases in levels of energy expenditure.
- The chart opposite sets out adult obesity rates for the six focus nations, and for Europe overall, which are based on Body Mass Index (BMI). It should be noted that the BMI measure has clear limitations, for example through not accounting for whether excess weight is caused by fat or lean body mass. Indeed, recent research has demonstrated that waist-to-height ratio (WHtR) is a superior measure for predicting adverse health outcomes (Savva et al., 2013). BMI data is presented here due to the ready availability of comparable international data using this metric.
- Efforts to improve nutrition and dietary choices, and to raise awareness of the energy content in food and drink, are prominent in the public health response to the obesity epidemic. But understanding physical activity's role in achieving energy balance and preventing obesity is an important part of any effective response.
- However, the consequences of physical inactivity are not solely related to weight gain or obesity. Individuals who are of normal weight, but are inactive, are still at heightened risk of developing major non-communicable diseases (NCDs) such as diabetes, cancers and coronary heart disease (CHD).
- This is evidenced further on the following slide: inactivity has been identified by the WHO as the fourth-leading risk factor for global mortality; while overweight and obesity are ranked fifth. This highlights the fact that while physical inactivity is an important contributor to the obesity epidemic, it must be seen as a discrete public health challenge in itself; one which warrants specific interventions.

Obesity rates, % of adult population, 2012 or most recent year



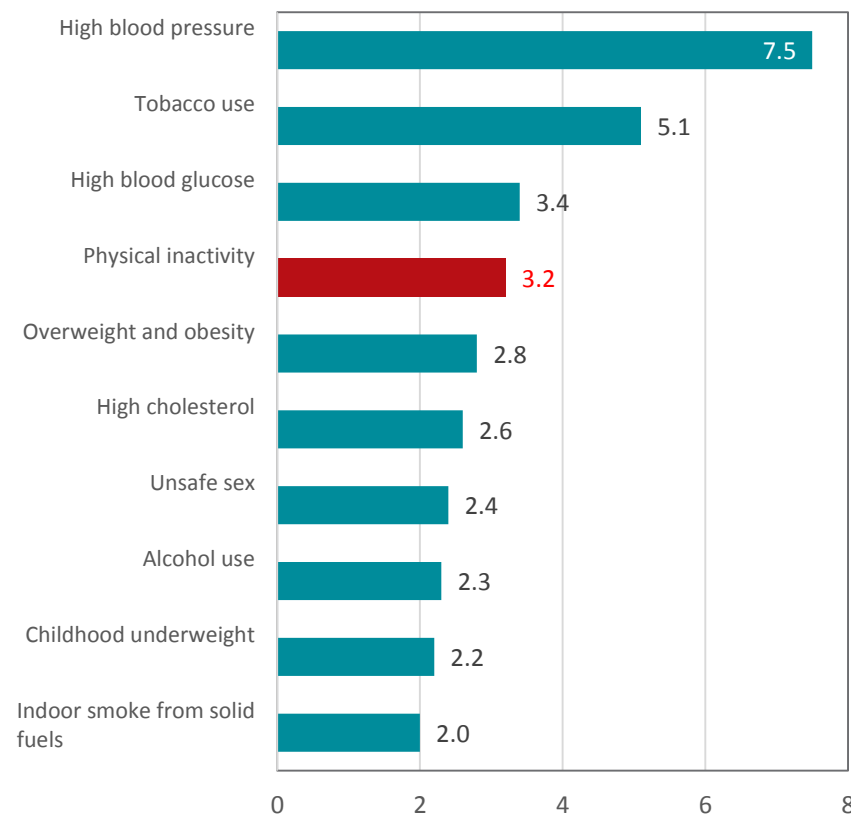
Source: OECD

**Note:** 'Obesity rate' in the chart above refers to the proportion of adults with a BMI which is greater than or equal to 30. European average refers to EU-27 due to data being drawn from 2012 publication (prior to Croatia's accession to EU in 2013).

# Physical inactivity is the 4<sup>th</sup> leading risk factor for global mortality

- The impact of insufficiently-active lifestyles can be seen through comparing inactivity's role in global mortality with those of other risk factors. As illustrated in the chart opposite, physical inactivity has been identified as the fourth leading risk factor for global mortality. A 2009 study by the WHO estimated that physical inactivity accounted for roughly 6% of global deaths in 2004 – equal to around 3.2 million deaths in that year.
- Due to the complex inter-relationships between various risk factors, this estimate is subject to uncertainty. For example, inactivity can give rise to overweight and obesity, or high blood pressure – in these cases, the exact contribution of inactivity is difficult to isolate, and may indeed be understated. A more recent study finds that the risks posed by physical inactivity contribute to twice as many deaths as obesity (Ekelund et al, 2015).
- At a global level, a 2012 analysis concluded that the proportion of total deaths which are accounted for by physical inactivity stands at 9% (Lee et al. 2012). Taking into account population growth over the period, this is consistent with 5.3 million of the 57 million global deaths in that year being due to physical inactivity. This study notes that on an international scale, inactivity can be considered a similar threat to the well-established and well-known risk factors of smoking and obesity.
- Physical inactivity is a key risk factor for a number of major diseases, such as cardiovascular disease, stroke, hypertension, type II diabetes and some forms of cancer. In terms of the four major NCDs considered in this study, physical inactivity plays the greatest role in the prevalence of colorectal cancer: around 10.4% of all global colorectal cancer cases are attributable to physical inactivity.
- Physical inactivity levels are rising in many countries, with major implications for the prevalence of these non-communicable diseases, and the general health of the global population.

Top ten leading risk factors for global mortality (millions of deaths), 2004

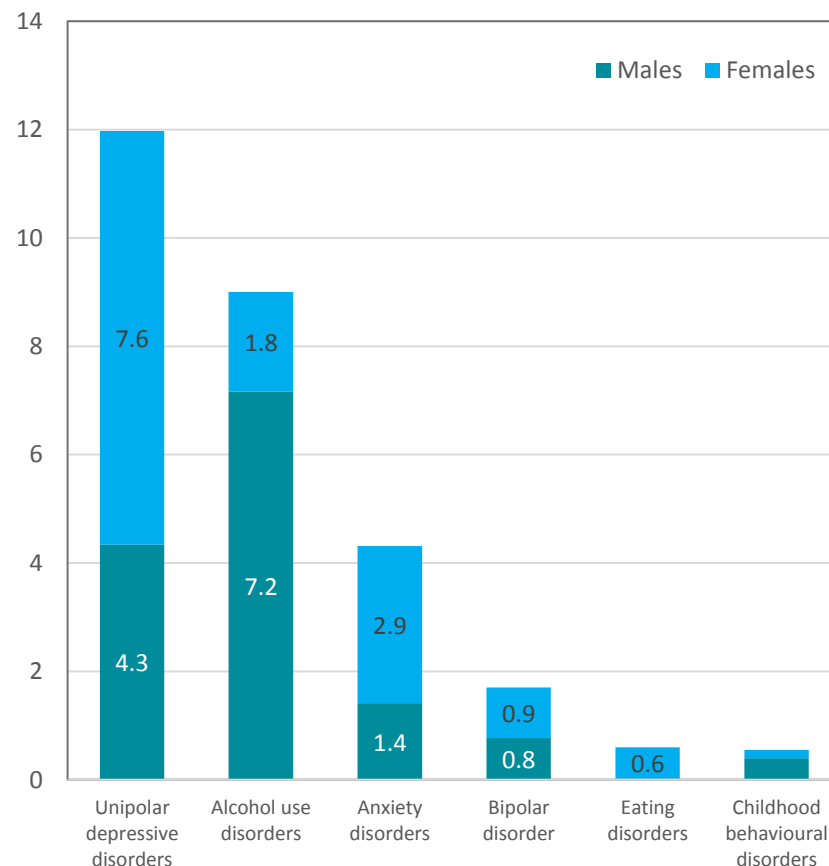


Source: WHO, Cebr analysis

# Every fourth European citizen is affected by mental ill health

- In addition to its substantial role in the prevalence of physical disorders and mortality, inactivity also contributes to mental ill health. Mental ill health accounts for almost 20% of the burden of disease in the WHO European region (as measured by disability-adjusted life years, or DALYs); and affects one in four people at some stage of their lives. It is estimated that 83 million people are currently affected by mental ill health across the region, with rates for women significantly higher than in the male population (33.2% versus 21.7%).
- Various studies, methods and criteria have established the links between physical activity and mental health. Increased physical activity is associated with reductions in depression, anxiety, low self-esteem, psychological distress and emotional disturbance (Hyde 2013, RCP 2010, Larun 2006).
- The cost of depressive disorders – a category of mental illness for which the benefits of physical activity as a preventative measure are well-established – amounted to almost 12 million DALYs in 2012, which made it the third-most costly disease of over 150 separate (both physical and mental) conditions considered in the WHO’s analysis.
- Mental health problems often begin in childhood, before continuing through life. Thus tackling mental health issues at an early age can have substantial life-long benefits, and physical inactivity can play a role in helping to achieve this.
- Increased activity is associated with fewer depressive symptoms among adolescents, improvements in self-esteem, reduced anxiety and stress. Many studies highlight that benefits are most significant from leisure time activity (i.e. outside of work or structured school programmes), underlining the importance of exercise, sport and play which is fun and accessible to all.

**Mental/behavioural disorder costs to Europe in 2012, millions of disability adjusted life years (DALYs), add more/disaggregate**



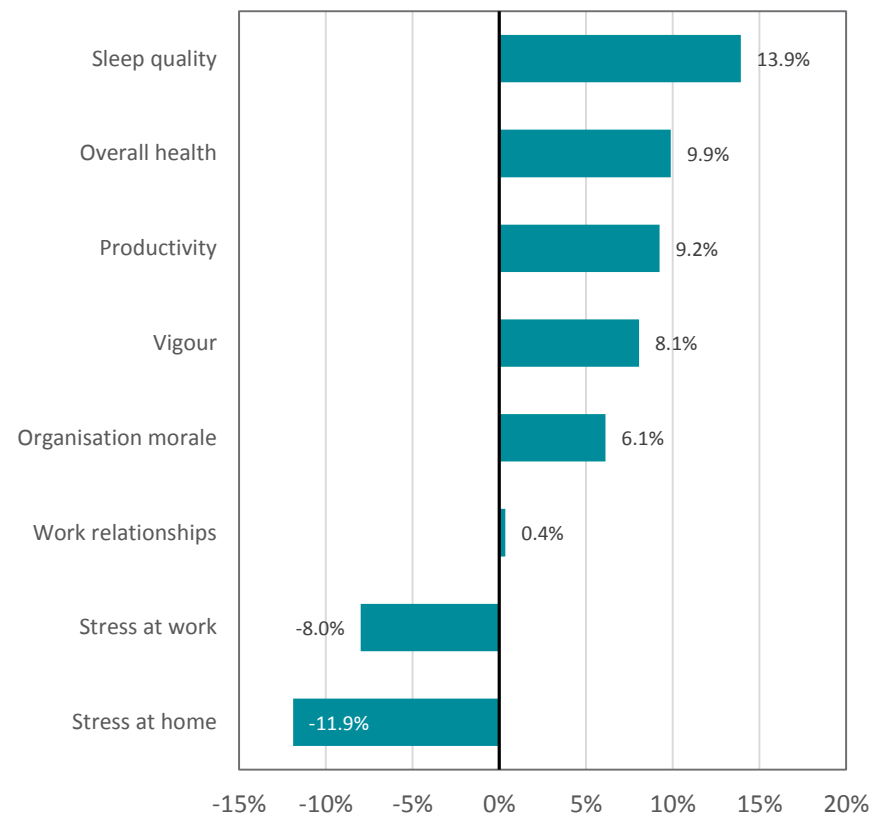
Source: WHO, Cebr analysis

**Note:** Europe on this slide refers to the WHO region

# Physical activity can lead to improvements in mental health and wellbeing

- Some aspects of the mental health benefits of physical activity can be explored through analysis of self-reported indicators of wellbeing. The data presented here are from Global Corporate Challenge (GCC), a 16-week workplace intervention initiative aimed at increasing levels of physical activity. In 2012 this initiative saw over 185,000 participants from 112 different countries compete in teams to record the greatest number of steps, as measured by pedometers. As part of the programme, surveys are conducted pre- and post-participation, partly in order to assess the wellbeing impacts of prolonged periods of increased physical activity.
- The chart opposite illustrates the average change in scores on various self-reported wellbeing indicators following GCC participation, relative to the equivalent scores recorded pre-participation.
- Participants reported that raising their levels of physical activity yielded substantial and significant improvements to sleep quality, productivity, vigour, morale and overall health; while reducing their experience of stress, both at work and at home.
- This highlights some of the further benefits of physical activity (above and beyond reducing an individual's risk of developing various NCDs). Making simple but sustained changes to lifestyles in order to accommodate greater levels of physical activity can improve many aspects of a person's quality of life.
- In particular, the positive impacts on stress, sleep quality and morale have important economic implications – healthy and happy workers are more productive and effective, take fewer sick days, contribute more to their firms, and to the economy. The economic costs inherent in inactivity-related sickness absence and impaired potential can be directly assuaged through simple efforts and interventions to encourage greater activity. Supporting workers to become more active amounts to a boost in productivity, wellbeing and effectiveness – a crucial goal at a time of muted labour productivity growth across Europe.

**Average impacts on self-reported wellbeing indicators following participation in Global Corporate Challenge (n=33,612)**



Source: Global Corporate Challenge

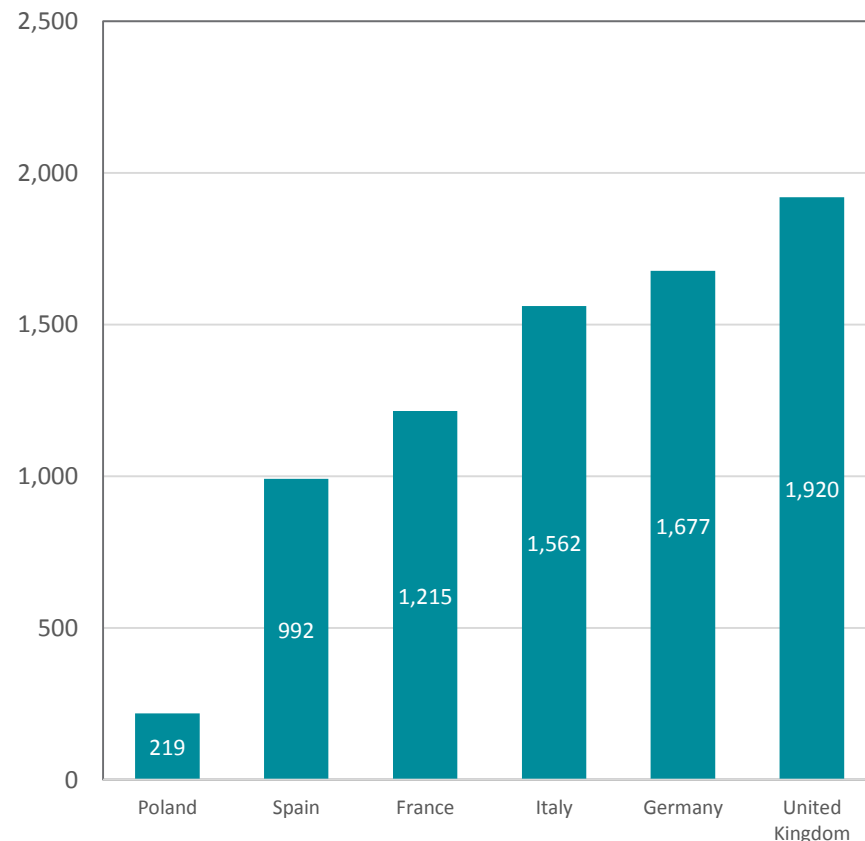
**Note:** Values in the chart above represent the average change in various self-reported wellbeing indices, on the part of individuals who completed the GCC programme (changes are relative to the same respondent's scores prior to participating in the programme).



# The direct cost of treating inactivity-related disorders is over €9 billion per year

- The direct costs presented opposite comprise the total (public and private) health expenditure on the four major NCDs considered in this study that can be attributed to physical inactivity. This calculation seeks to understand which societal resources are devoted to treating activity-related disorders. The total direct cost for the six focus countries presented here reached €7.6 billion in 2012, with the direct costs to the EU-28 estimated at €9.2 billion.
- The direct burden of physical inactivity is estimated to have been the greatest in the UK, with inactivity costing the British healthcare system over €1.9 billion in 2012. This substantial cost burden is driven primarily by the remarkable rates of inactivity in the UK.
- Germany follows closely behind, with direct costs amounting to €1.7bn. Despite a lower proportion of the German population being insufficiently active (21%), their greater population leads to a relatively large absolute number of people who are inactive (around 14.5 million). In addition, Germany sees comparatively higher levels of healthcare spend upon treatment of the four main NCDs through which these direct costs are calculated.
- Italy sees the third-highest cost burden resulting from inactivity. This is driven by its sizeable inactive population (the second-largest of our six focus countries, in both absolute and relative terms).
- A smaller share of the French population is inactive than is the case in Spain – yet due to its larger size, the number of inactive persons is similar in both nations (14.9m and 14.3m in France and Spain, respectively). The greater cost burden in France can be attributed to relatively higher spend on the major NCDs, through which our inactivity-related costs are calculated.
- Of the six focus countries in this study, Poland sees by far the lowest direct costs resulting from inactivity. In 2012, total direct cost of inactivity for Poland is estimated at €219 million. This lower sum is driven both by a much higher proportion of the Polish population meeting the recommended levels of physical activity, as well as its relatively lower unit healthcare costs. Just 5.8 million adults in Poland are estimated to be inactive – this is less than a third of the equivalent figure for the UK.

Direct costs of physical inactivity across six focus countries (millions of Euros), 2012



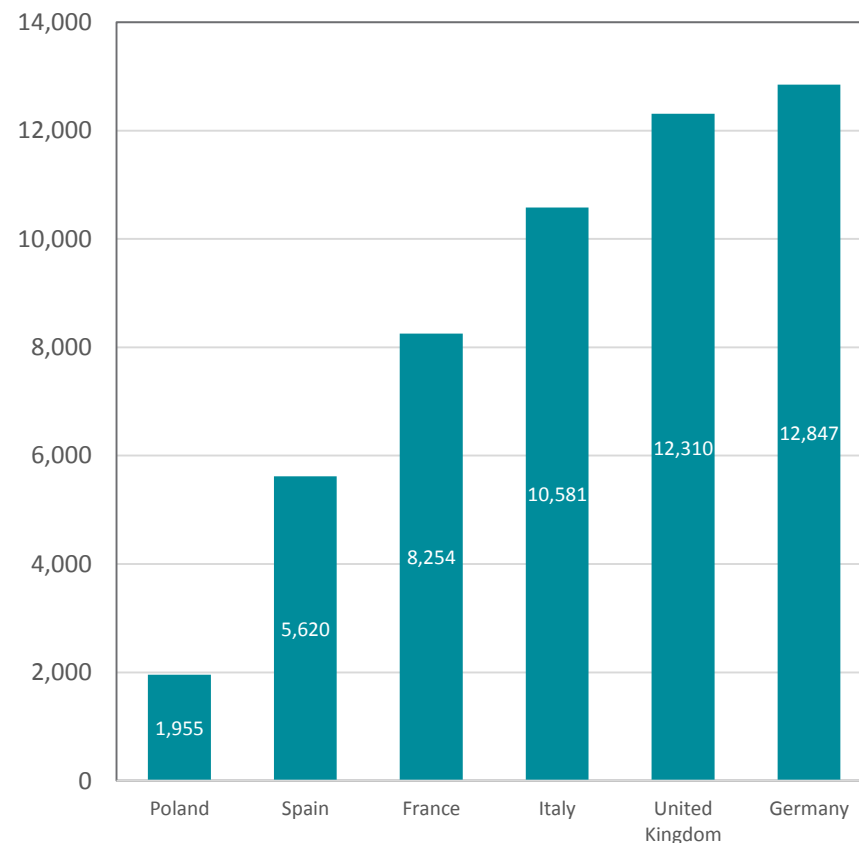
Source: Lee et al., (2012), WHO, OECD, Eurostat, IDA, EUCAN, Cebr analysis

**Note:** The indirect costs in the chart above refer to those resulting from physical disorders only.

# Inactivity's indirect costs amount to more than €70 billion

- The indirect costs presented here estimate the value of human capital which is lost to morbidity and premature mortality resulting from physical inactivity. These are calculated using the disability-adjusted life years (DALYs) lost as a result of the considered inactivity-related disorders.
- DALYs comprise of the sum of potential years of life lost (YLLs) due to premature death, and the equivalent years of 'healthy life' lost due to living with a disease (YLDs). Taken together, these represent the burden a disorder imposes upon society through its associated disability, ill health and premature mortality. Using national GDP per capita, we estimate the value of DALYs lost due to physical activity-related disorders during 2012: this approach assumes that the economic cost of losing a year of healthy life is equivalent to the economic output associated with a typical person in a given year.
- The specific disorders considered include the four major NCDs included within the direct costs calculation, as well as inactivity's estimated contribution to the burden of mood and anxiety disorders in each country. These indirect costs are vastly larger than the direct healthcare costs set out on the previous slide, reflecting the substantial burden to society which inactivity contributes through reduced length and quality of life.
- Across Europe, these indirect costs amount to €71.1 billion. The chart opposite sets out the indirect costs in our six focus countries; together these nations saw indirect costs of €51.6 billion in 2012.
- The largest indirect costs are seen in Germany, whose relatively higher per-capita GDP pushes its indirect costs to €12.8 billion, around 5% higher than in the UK, where the equivalent figure amounted to €12.3 billion.
- Comparatively high levels of inactivity in Italy contribute indirect costs of €10.6 billion, while the three focus countries with the smallest absolute numbers of inactive people (12.1m in France, 11.7m in Spain, 5.8m in Poland) see lower indirect costs.

**Indirect costs of physical inactivity across six focus countries (millions of Euros), 2012**

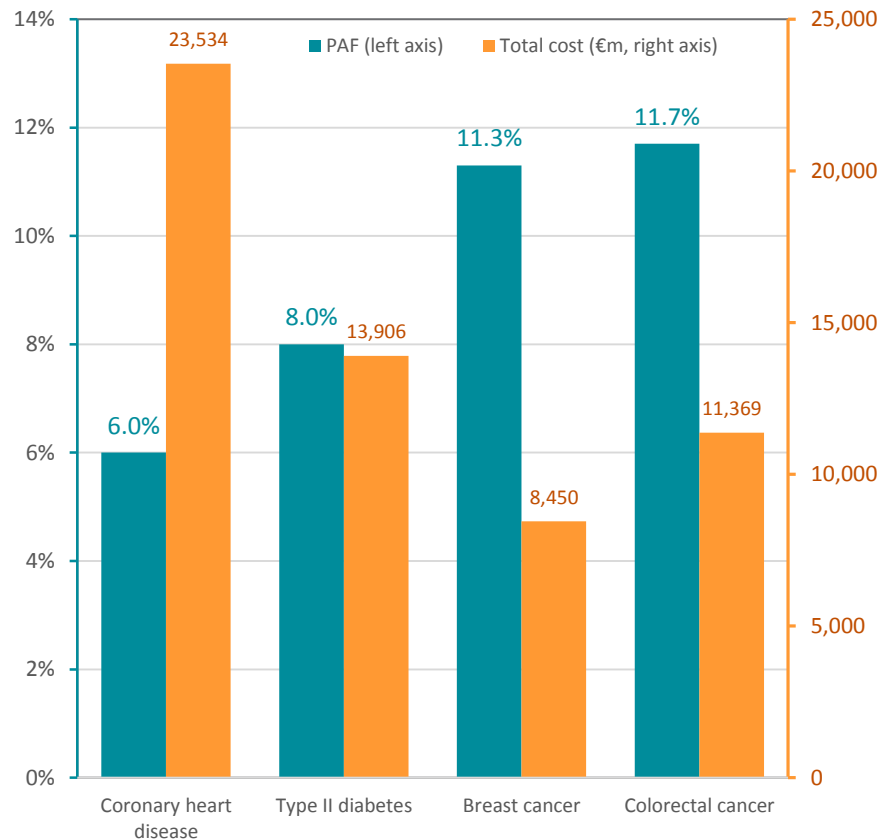


Source: Lee et al., (2012), WHO, OECD, Eurostat, IDA, EUCAN, Cebr analysis

# The direct and indirect costs of inactivity in the EU-28 exceed €80 billion per year

- The economic calculations in this report seek quantify some of the ways in which inactivity is impairing the economic potential of European individuals and societies. Nevertheless, it is clear these economic calculations are just a small part of the human and social costs we are currently living with as a result of inactivity.
- With these caveats, physical inactivity is estimated to have cost €80.4 billion across Europe in 2012, through the channel of these four major NCDs and the indirect costs of mood and anxiety disorders.
- Of the four major NCDs considered in this study, inactivity-related coronary heart disease (CHD) is by far the biggest contributor to the total economic cost of inactivity in Europe, amounting to almost €23.5 billion in 2012. While just 6.0% of European CHD prevalence is estimated to be attributable to inactivity, it is a costly disease – both in terms of treatment, and the costs of associated morbidity and mortality.
- Type II diabetes is the next most significant disease channel through which physical inactivity imposes costs to the economies of Europe. Due to the much greater prevalence of diabetes across the region (relative to the other major NCDs examined), the total economic cost burden on Europe is estimated to be €13.9 billion in 2012. If all Europeans met their recommended guidelines for exercise and activity, 2.3 million cases of diabetes could potentially have been averted. A higher proportion of breast and colorectal cancers are attributable to inactivity than the other two NCDs considered in the study. However, due to their relatively lower prevalence, the total cost burden to Europe is lower – amounting to €8.5 billion and €11.4 billion, respectively.
- Along with these costs (resulting from physical disorders) are an estimated €23.1 billion in indirect costs, arising from inactivity-related mood and anxiety disorders.

**Estimated PAFs for disorders related to physical inactivity, and total cost of inactivity-related disorders to Europe, 2012**



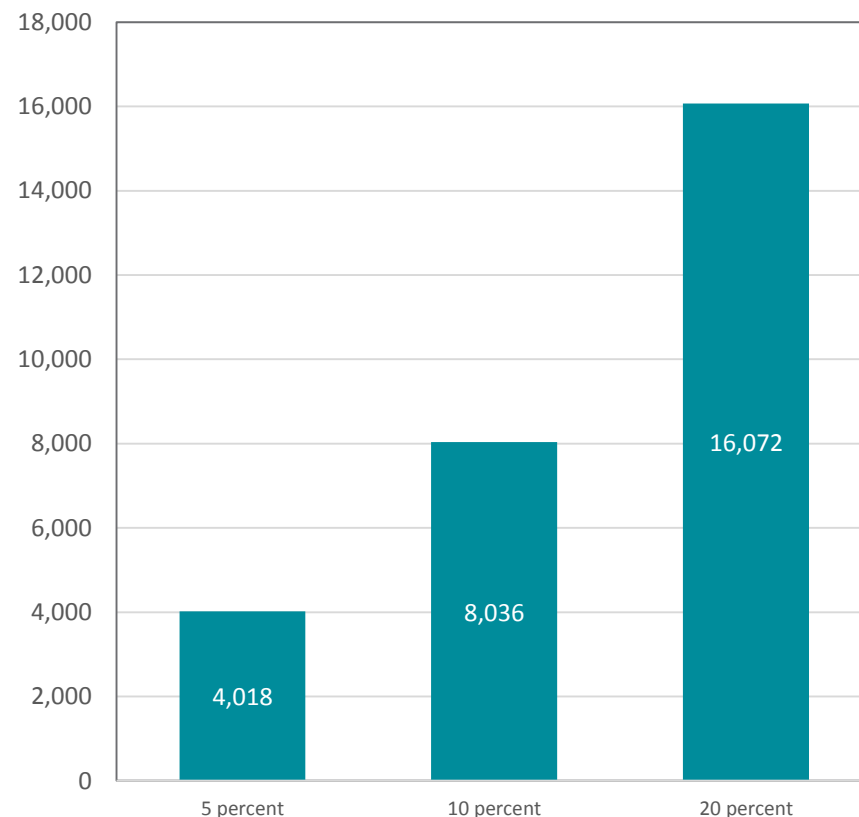
Source: Lee et al., (2012), WHO, OECD, Eurostat, IDA, EUCAN, Cebr analysis

**Note:** Discussion of Europe on this slide refer to the EU-28. All monetary figures are expressed in current (2012) prices at market exchange rates.

# Cutting inactivity by a fifth would save Europe €16.1 billion

- The preceding analysis has outlined the substantial costs of inactivity to Europe, and highlighted its importance both as a public health and economic concern. However, simple efforts to curtail sedentary lifestyles and encourage physical activity could in turn save many lives and produce enormous economic benefits. The chart opposite indicates the economic savings associated with reductions in the prevalence of physical inactivity.
- These figures are calculated as the costs associated with the relevant proportion of the inactivity-related disease burden. In other words, they are the economic costs which would not have been incurred in 2012, had the prevalence of inactivity within Europe's adult population been lowered by 5%, 10% and 20%.
- In a scenario where the prevalence of inactivity had been 20% lower, the total cost savings could amount to €16.1 billion. These savings accrue through the averted cases of the major NCDs, resulting in a lower burden on European healthcare systems. In addition, these NCD reductions avert the economic costs of curtailed healthy life, thereby reducing the indirect cost burden.
- Even more modest reductions in the population of inactive European adults, of 5% or 10%, would have averted economic costs of around €4.0 billion and €8.0 billion, respectively.

**Estimated cost savings (direct and indirect) from reductions in the prevalence of physical inactivity in Europe, millions of Euros, 2012**



Source: Lee et al., (2012), WHO, OECD, Eurostat, IDA, EUCAN, Cebr analysis

**Note:** Discussions of Europe on this slide refer to the EU-28.

# This 20% reduction could avert 100,000 deaths annually

- The societal burden of inactivity in Europe extends far beyond economic costs. Inactivity also imposes widespread costs to individuals and families, by contributing to serious diseases and leading to hundreds of thousands of avoidable deaths across Europe each year. These severe health consequences impose huge emotional and human costs across society, and the intrinsic value of life and health lost to such outcomes cannot be satisfactorily captured in economic terms.
- But while this analysis is concerned primarily with the economic dimension of the problem, the disease cases and deaths associated with inactivity should not be overlooked. The tables opposite show the number of NCD cases, as well as total deaths, which could have been averted had all European citizens undertaken a lifestyle involving at least 150 minutes per week of activities such as jogging, swimming or playing sport.
- Physical inactivity is estimated to be responsible for 10.4% of all deaths in Europe. This means that the adoption of such small but important lifestyle changes could have averted over 511,000 deaths in 2012 alone. Had the prevalence of inactivity been 20% lower, more than 100,000 deaths could have been avoided.
- Of the four major NCDs considered, inactivity is associated with the highest number of type II diabetes cases. Had the number of inactive Europeans been lowered by one-fifth, nearly half a million cases of type II diabetes may not have developed.
- Reducing inactivity by this proportion could also have reduced the number of European breast and colorectal cancer cases by over 50,000.

**Estimated reductions in European disorder prevalence and deaths associated with given declines in inactivity, 2012**

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in breast cancer cases	8,200	16,300	32,600
Potential decline in colorectal cancer cases	5,600	11,200	22,400
Potential decline in type II diabetes cases	115,000	231,000	462,000
Potential decline in CHD cases	8,400	16,700	33,400

Percentage decline in physical inactivity	5%	10%	20%
Potential deaths averted	25,600	51,100	102,200

Source: Lee et al., (2012), WHO, OECD, Eurostat, IDA, EUCAN, Cebr analysis

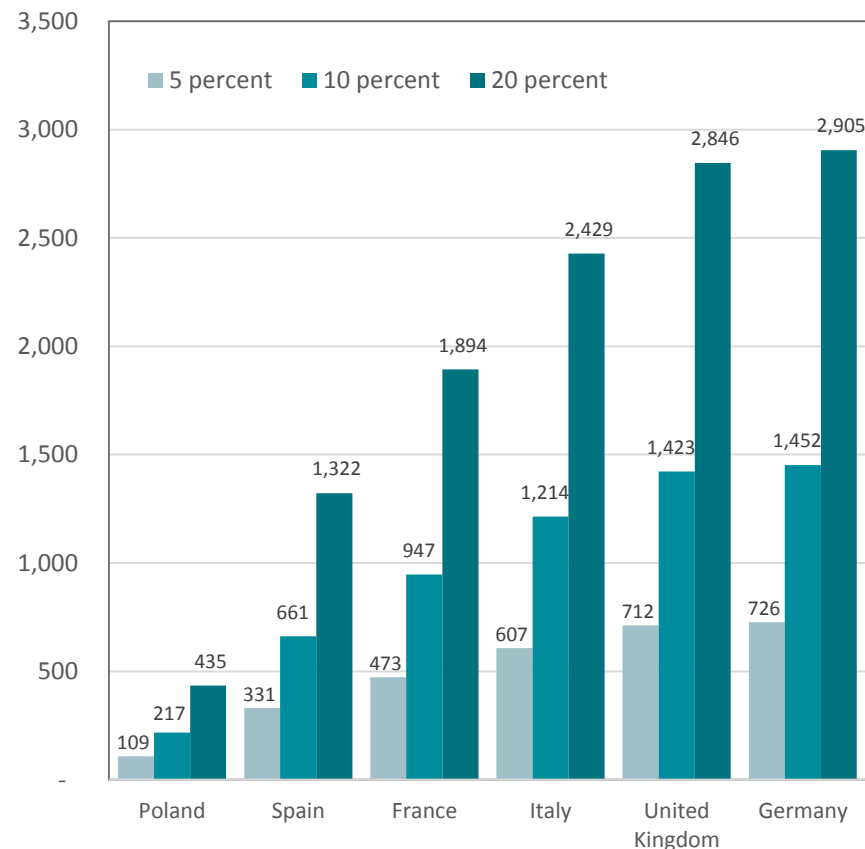
**Note:** Europe on this slide refers to the EU-28, except for CHD figure which excludes Greece, due to lack of data. Cancer case estimates are based on 5-year prevalence rates.



# €11.8 billion could be saved among the six focus countries

- Each of the six focus countries in this report could achieve large direct and indirect cost savings through efforts to cut inactivity levels among their respective populations. The potential savings of these six countries comprise around three-quarters of the total across the EU-28, which is a proportion broadly in line with their equivalent shares of EU GDP and health expenditure.
- The potential benefits are the greatest in Germany, where the direct and indirect cost savings from a 20% reduction in the prevalence of physical inactivity amount to an estimated €2.9 billion.
- The UK could see similar potential benefits, which can be understood in light of its status as the least active of the six focus countries. If the number of UK adults who do not meet recommended levels of physical activity had been 20% lower in 2012, this could have averted costs of around €2.8 billion in that year.
- A similar reduction in inactivity levels across Italy, France and Spain could have seen their inactivity-related economic costs in 2012 reduced by €2.4 billion, €1.9 billion and €1.3 billion, respectively.
- Poland is estimated to see the smallest absolute gain in cost savings through reducing inactivity levels – a 20% reduction is consistent with savings of €435 million in 2012.
- It is important to note that these economic cost savings, driven as they are by levels of healthcare spending on various NCDs and average productivity in each nation, will vary according to such economic factors. This does not mean that the burden of inactivity is negligible in Poland relative to the UK or Germany. Rather, it means that the economic lens through which we evaluate these costs is necessarily influenced by underlying economic differences between these countries.

**Estimated cost savings (direct and indirect) from achieving declines in physical inactivity prevalence in six focus countries, €m, 2012**

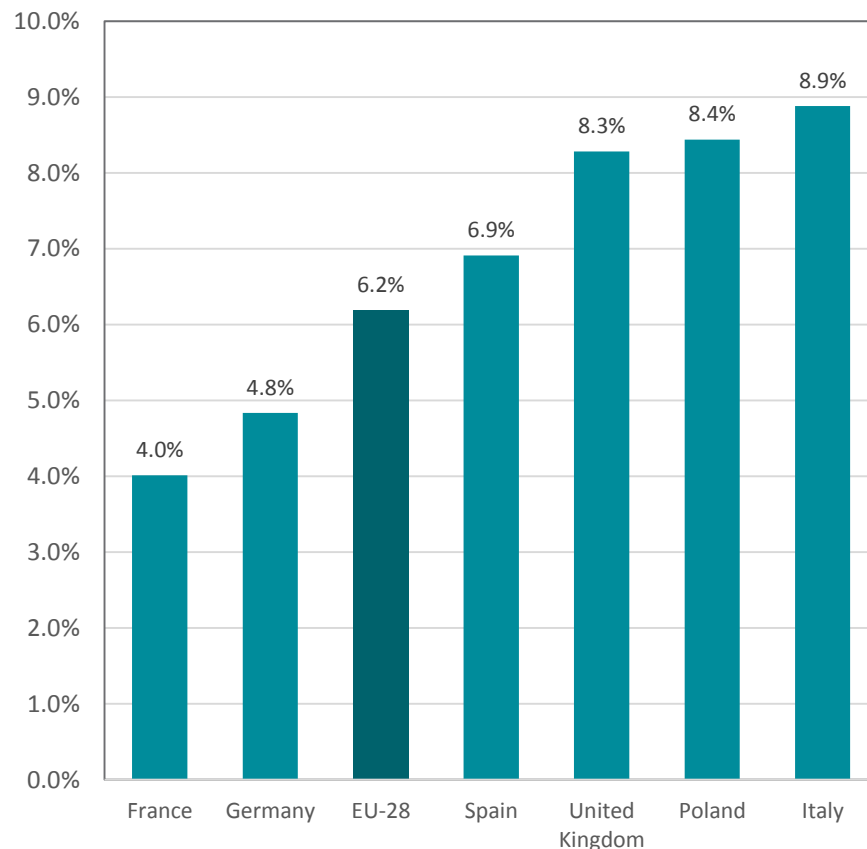


Source: Lee et al., (2012), WHO, OECD, Eurostat, IDA, EUCAN, Cebr analysis

# The costs of inactivity are substantial in terms of healthcare spend

- The costs of physical inactivity, arising through its role as a major risk factor through the four major NCDs and mood and anxiety disorders, amounted to €80.4 billion in 2012 in Europe. This equates to 6.2% of total healthcare expenditure across the EU-28 in that year.
- Below, we compare this figure with estimates of the costs associated with various other social and medical problems. While such estimates vary greatly in scope and methodology, these comparisons are intended purely to understand at a high level how the economic burden resulting from inactivity compares to that of other social issues.
- The cost of inactivity is 1.4 times that of the damage cost of air pollution and greenhouse gases from industry across Europe (EU-27), which was estimated from around €59 billion in 2012 (EEA 2014).
- Inactivity costs Europe more than three times the total direct healthcare spending on the treatment of smoking attributable diseases, which totalled €25.3bn in 2009 (GHK 2012); and approaching three times the direct economic costs of human trafficking in Europe, estimated at around €30 billion (Levy et al., 2013).
- As a proportion of total healthcare expenditure, the costs of inactivity are highest in the Italy, representing 8.9% of health spending in 2012. Following closely behind is Poland and the UK, where the costs of inactivity are equivalent to around 8.4% and 8.3% of total health expenditure in 2012, respectively.
- In 2012, the annual economic costs of inactivity to the EU-28 were equivalent to around half of the **total GDP of Ireland, Portugal or the Czech Republic**; or greater than the **combined GDP of Luxembourg, Iceland and Cyprus** in that year.
- The burden of physical inactivity as a proportion of health expenditure in France and Germany is relatively smaller, despite the absolute cost of inactivity being higher – this is due to the substantially greater healthcare expenditure by these nations in comparison to Poland, Spain and Italy.

The total cost of inactivity as a proportion of healthcare expenditure, 2012

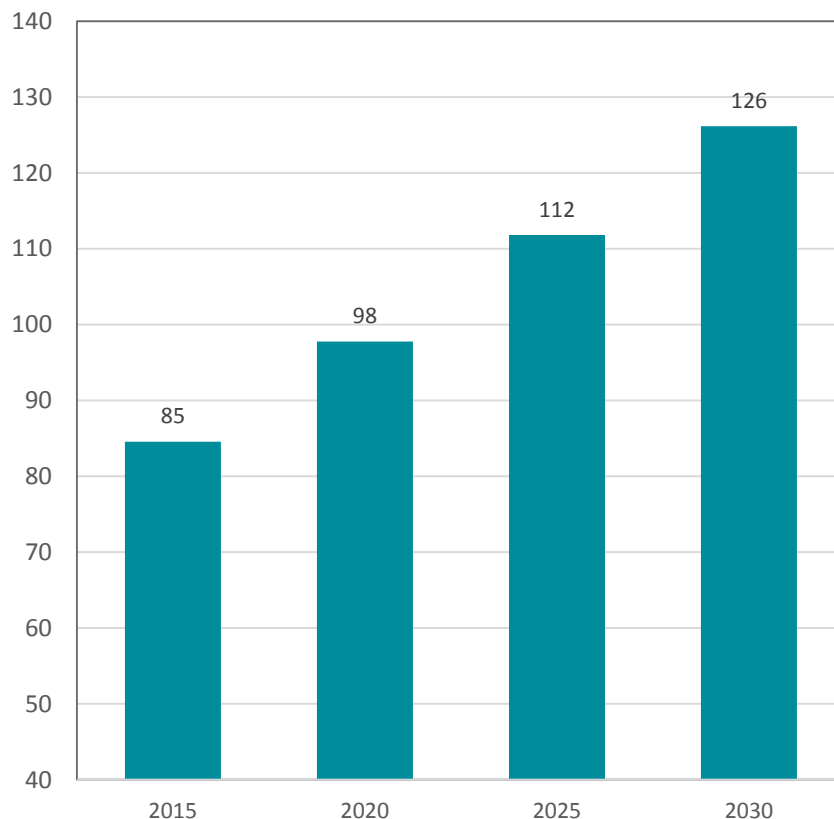


Source: Lee et al., (2012), WHO, OECD, Eurostat, IDA, EUCAN, Cebr analysis

# The 'inactivity time bomb' implies ever-greater costs; defusing it is both simple and complex

- The nature of inactivity as a behaviour which precipitates future health problems means that today's inactive population can be expected to give rise to tomorrow's increasing economic costs. This is a concern globally but particularly in Europe, where an ageing population and long-term rises in healthcare costs are already among the serious health challenges facing its society. The chart opposite sets out a conservative projection for how these annual costs of inactivity could rise in future years.
- However, a cause for optimism is that this is a problem which can be tackled effectively. The overwhelming part of the consequences of inactivity can be addressed without the needing costly pharmaceuticals, complex medical intervention, or detailed expert analysis.
- For most people, the health and wellbeing benefits are achievable through simple, but sustained, lifestyle choices that involve being more active, exercising, spending time outdoors, running or playing sport. In other words, the 'medicine' is inherently free and available to everyone. Defusing the inactivity 'time bomb' will not be as simple as cutting a wire, but we can be encouraged by knowing that potential remedies are abundant and accessible.
- The task is to encourage and support individuals' choices to be more active in all walks of life: during sport or recreation, at school, at work, at home and during family life, or while travelling. This is a complex undertaking, with no 'one size fits all' solution. One part of the answer is raising awareness and educating people about the physical, mental and social benefits of physical activity; another is providing infrastructure and opportunities for exercise which are accessible, affordable, safe, inclusive and fun.
- A concerted and coordinated effort by policy-makers, health professionals, businesses and households will be required to avert these economic costs over the coming years. But while the scale of the challenge is large, the solution at an individual level is simple: to take more active steps towards less sedentary lifestyles.

**Projected costs of inactivity to the EU-28 (direct and indirect), € billions, 2012 prices**



Source: Eurostat, OECD, Cebr analysis

**Note:** This crude projection is based on trends in the population structure of Europe. This informs an estimate of the prevalence of inactivity-related physical and mental disorders among various age groups, a calculation which assumes the contributions of their various risk factors (including physical inactivity) remain constant at 2012 levels. Economic costs per disorder case are assumed to rise in line with GDP per capita. To the extent that future healthcare costs rise more rapidly than this, or rates of inactivity rise in future, these projections can be considered under-estimates.

# *Implications of physical inactivity by country*

**France**

**Germany**

**Italy**

**Poland**

**Spain**

**United Kingdom**



# The extent and costs of physical inactivity in France

- The proportion of French adults who fail to engage in the recommended levels of physical activity is estimated **at around a quarter (24%)**. For children and adolescents, the proportion is much higher – reaching **90% for 15-year-olds**. A wide disparity is seen between the genders – 19% of adult men fail to meet the recommended levels of activity, compared to 29% of adult women.
- As a result, inactivity is estimated as being responsible for 8.7% of all deaths in France – equivalent to around **46,400 people in 2012**. These represent lives which could have been saved if these individuals had adopted lifestyles involving appropriate levels of physical activity.
- Through its contribution to four major physical disorders, inactivity in France imposes **annual direct healthcare costs of €1.2 billion**. These physical disorders also have an impact on the economy through an additional **€4.3 billion in indirect costs** (referring to the estimated economic value of healthy lives lost to disease and premature mortality).
- Inactive lifestyles are also linked to mental health disorders. We estimate that inactivity-related depressive and anxiety disorders result in the loss of around **124,000 disability-adjusted life years (DALYs)** per year in France, consistent with an economic cost of **nearly €4.0 billion**.
- Combining these monetary estimates results in **total annual economic costs of €9.5 billion**, equivalent to 4.0% of French healthcare spending, almost (93%) France's entire budget for foreign aid, or over twice as much as the estimated direct public healthcare expenditure on smoking-related diseases in France. This burden to French society could be averted entirely if all inactive persons could be encouraged to adopt simple lifestyle changes, incorporating more exercise in their daily or weekly routines. Even interventions to bring just one-fifth of currently inactive French people up to the recommended levels of activity could yield benefits worth **€1.9 billion**.
- These sums nonetheless represent substantial under-estimates of the potential benefits of increasing physical activity. The gains from activity are numerous and interrelated – including alleviating stress levels and supporting wellbeing, enhancing productivity, and reducing the likelihood of future health complications. These positive outcomes are interconnected, yielding compounding individual, economic and social benefits which extend **far beyond the monetary sums** discussed above.

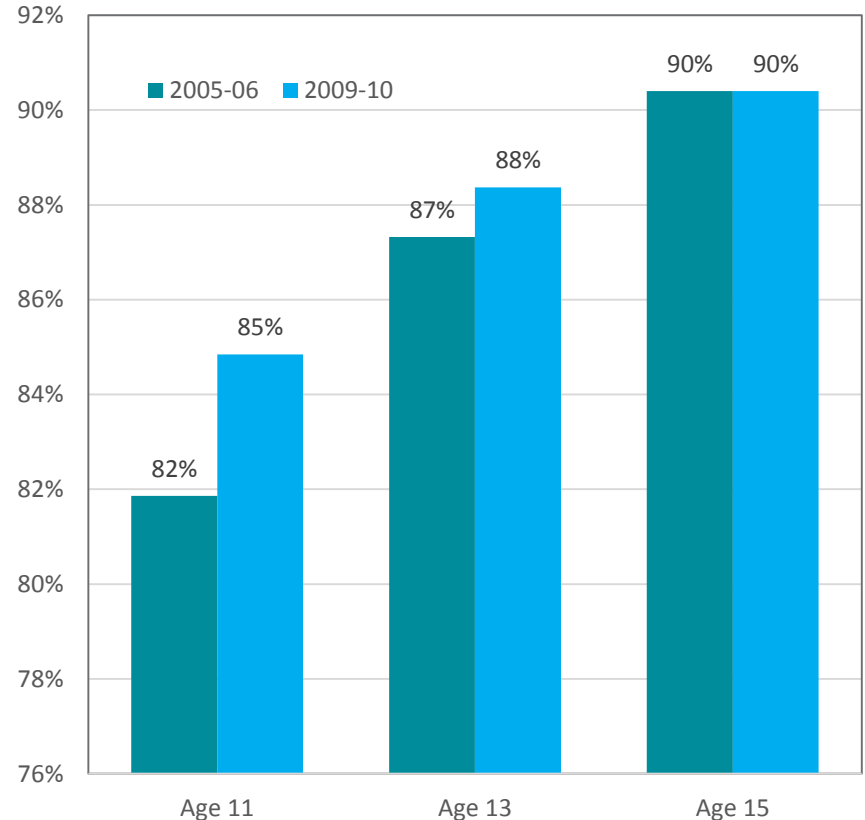
# A quarter of French adults are insufficiently active

- WHO data estimates that in 2010, 23.8% of people aged 18 years or older in France were estimated to be insufficiently active. Women were less likely to meet the recommended levels of physical activity than French men – 28.5% of women fail to meet these targets, compared with 19.1% of men.
- Inactivity across levels across the three age groups in the chart opposite have risen over the four-year period presented. The age group to show the largest increase in the prevalence of inactivity was children aged 11 – the proportion of inactive 11-year-olds rose by three percentage points.
- However, in both measurement periods it is clear that the prevalence of inactivity increases substantially between those aged 11 and 15. In 2009-10, an adolescent aged 15 was 5% less likely to undertake the recommended levels of physical activity than an 11-year-old child.

## The costs of inactivity in France

- Physical inactivity is a key risk factor for a number of serious illnesses, i.e., coronary heart disease, type II diabetes, some cancers and all-cause mortality. In the following slides, we consider the extent to which physical inactivity impacts upon the prevalence of these diseases in France.
- In France, the greatest proportional impacts of physical inactivity are on breast and colorectal cancer cases. Relative to the other diseases examined, physical inactivity makes a smaller contribution to France's CHD cases, with just 5.4% of CHD prevalence attributable to inactivity.

Proportion of children that are insufficiently active in France, 2005-06 and 2009-10



Source: Currie et al., 2008 and 2012, Cebr analysis



# Cutting inactivity by 20% in France could avert 9,300 deaths

## Physical activity levels are lower among lesser educated segments of French society

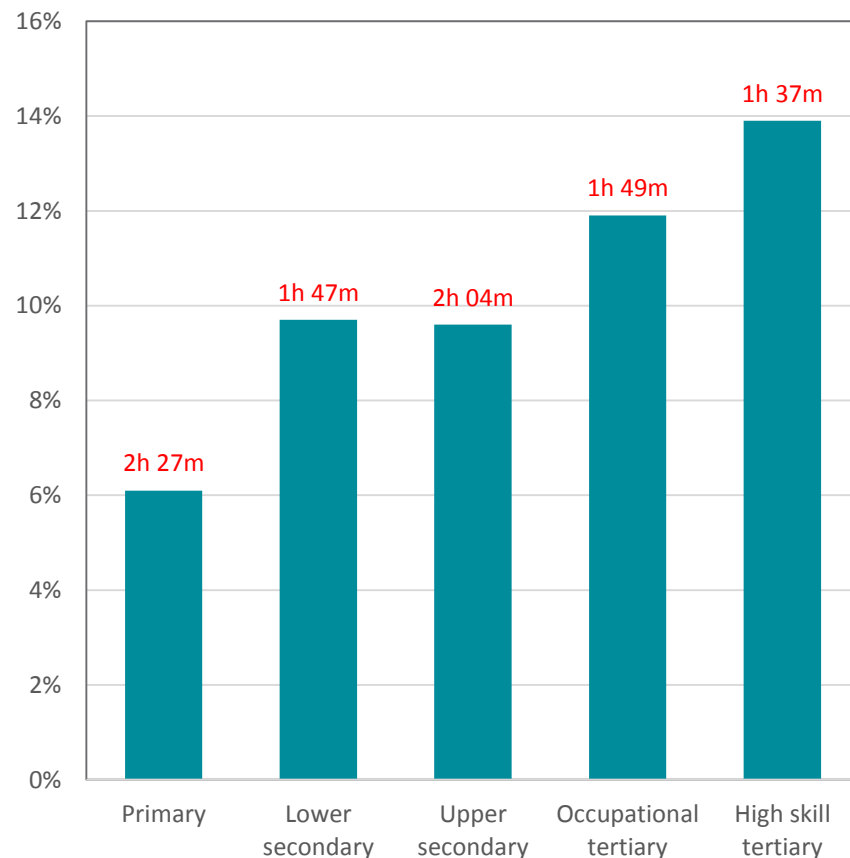
- Participation in physical activity (particularly that which is undertaken during leisure time) – tends to increase in accordance with rising socio-economic status. The chart opposite illustrates the proportion of French people who participated in sport and other outdoor activities (excluding walking and hiking), and the average duration of this activity for those who did participate in it.
- Just 9.3% of respondents undertook sports or other outdoor activities – this proportion varies from 6.1% among those who have only completed primary education; to 13.9% among those who are educated to higher tertiary level (in this comparison, educational attainment is intended as a proxy for socio-economic class: underlining that those who are less well-educated are significantly less likely to find time to engage in sport or outdoor recreation).
- More recent research confirms that this trend is also observed among French children: those from less-affluent families are 58% more likely to not achieve recommended activity levels than their counterparts from highly affluent families (Borraccino et al., 2010).

## All-cause mortality and life expectancy gains

- Physical inactivity is estimated to be responsible for 8.7% of all deaths in France. This implies that if all inactive persons across France were active, over 46,400 deaths could have been averted in 2012 – sufficient to increase overall life expectancy by 0.55 years. While below the EU average life expectancy gain (0.63 years), this is likely attributable to relatively lower levels of physical inactivity observed in France compared to other European countries.
- Inactive individuals in France are estimated to see life expectancy gains of 3.36 years if they were to meet recommended levels of physical activity.
- As physical inactivity is unlikely to be completely eliminated, the table below illustrates the estimated potential deaths that could have been averted in 2012 when assuming decreases in physical inactivity of 5%, 10% and 20%.

Percentage decline in physical inactivity	5%	10%	20%
Estimated potential deaths averted	2,300	4,600	9,300

Daily participation in sport & outdoor activities in France (% of total); and average duration of activity (hh:mm), by highest education attained, 2000



Source: Eurostat, Cebr analysis

Note: Data from Time Use Survey. 'Primary' education refers to ISCED Level 1; 'Lower secondary' refers to ISCED Level 2; 'Upper secondary' encompasses ISCED Levels 3 & 4, 'Occupational tertiary' describes ISCED Level 5B; 'High-skill tertiary' describes ISCED Levels 5A & 6.

# Thousands of cancer cases in France could be averted through increased activity

## Breast cancer

- Physical inactivity is estimated to account for 9.6% of the breast cancer prevalence in France. This is equivalent to a direct healthcare burden of €100 million. Based on 5-year prevalence rates, over 207,000 people were estimated to have breast cancer in 2012. If inactivity was eradicated entirely, this could reduce the number of breast cancer cases by 19,900.

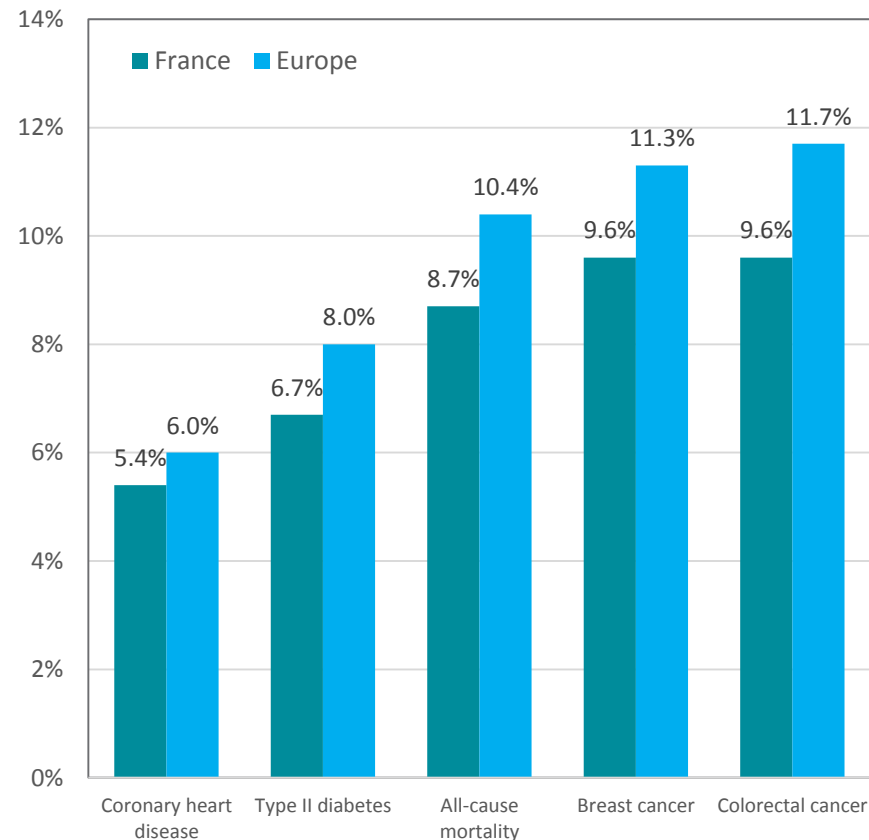
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in breast cancer cases (5-year prevalence)	1,000	2,000	4,000
Potential direct healthcare cost savings (millions)	€ 5.0	€ 10.0	€ 20.0

## Colorectal cancer

- Over 122,800 people are estimated to have colorectal cancer in France (based on 5-year prevalence), with an additional 40,800 being diagnosed in 2012 alone. €716 million was directed towards colorectal cancer treatments in that year, equivalent to 0.3% of national healthcare expenditure.
- If the prevalence of physical inactivity was reduced by just 5%, an estimated 600 cases of colorectal cancer could have been averted in 2012, a number which reaches around 2,400 if the rate of inactivity declined by 20%. Such a fall – of a fifth – could save an estimated €13.7 million in direct healthcare costs.

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in colorectal cancer cases (5 year prevalence)	600	1,200	2,400
Potential direct healthcare cost savings (millions)	€ 3.4	€ 6.9	€ 13.7

Estimated population attributable fraction (PAFs) of physical inactivity in major diseases in France, 2008



Source: Lee et al., 2012, Cebr analysis

# The direct cost of inactivity in France amounts to €1.2 billion annually

## Type II diabetes

- Physical inactivity is estimated to cause 6.7% of all type II diabetes cases in France (a proportion marginally below the EU average). This amounts to 211,000 cases of diabetes which could potentially be averted if all persons in France were active.
- In 2012, the direct healthcare costs from diabetes associated with physical inactivity are estimated at €918 million. Given that the total eradication of physical inactivity is not likely to be an achievable goal, modest targets such as a 5% reduction could yield substantial benefits. Such a reduction could reduce diabetes cases by almost 11,000 and thereby unlock healthcare savings to the tune of €46 million.

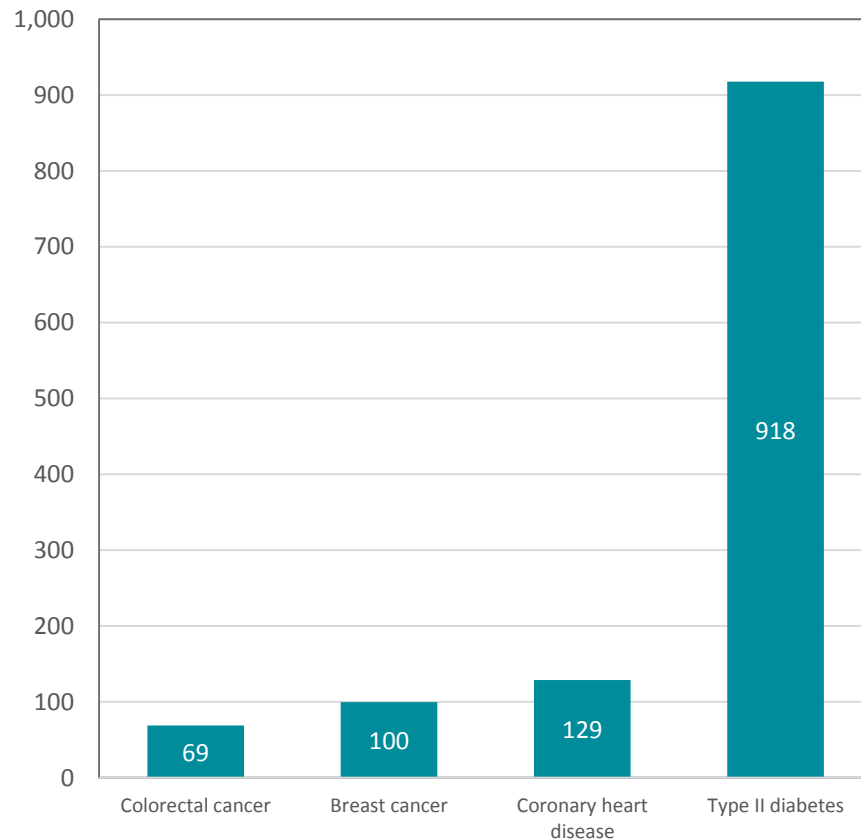
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in type II diabetes cases	11,000	21,000	42,000
Potential direct healthcare cost savings (millions)	€ 46	€ 92	€ 184

## Coronary heart disease

- The direct costs of CHD to the French healthcare system amounted to €2.4 billion in 2012, of which around €129 million is accounted for by CHD cases caused by physical inactivity.
- In 2012, over 291,000 CHD cases were reported in France. If all of those who were inactive were active, 15,700 of these CHD cases could potentially have been avoided in 2012. Even a 5% decline in physical inactivity could potentially reduce the burden on the French healthcare system by €6.4 million.

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in CHD cases	800	1,600	3,100
Potential direct healthcare cost savings (millions)	€ 6.4	€ 12.9	€ 25.8

Direct healthcare costs attributable to physical inactivity through physical disorders, France, 2012 (million €)



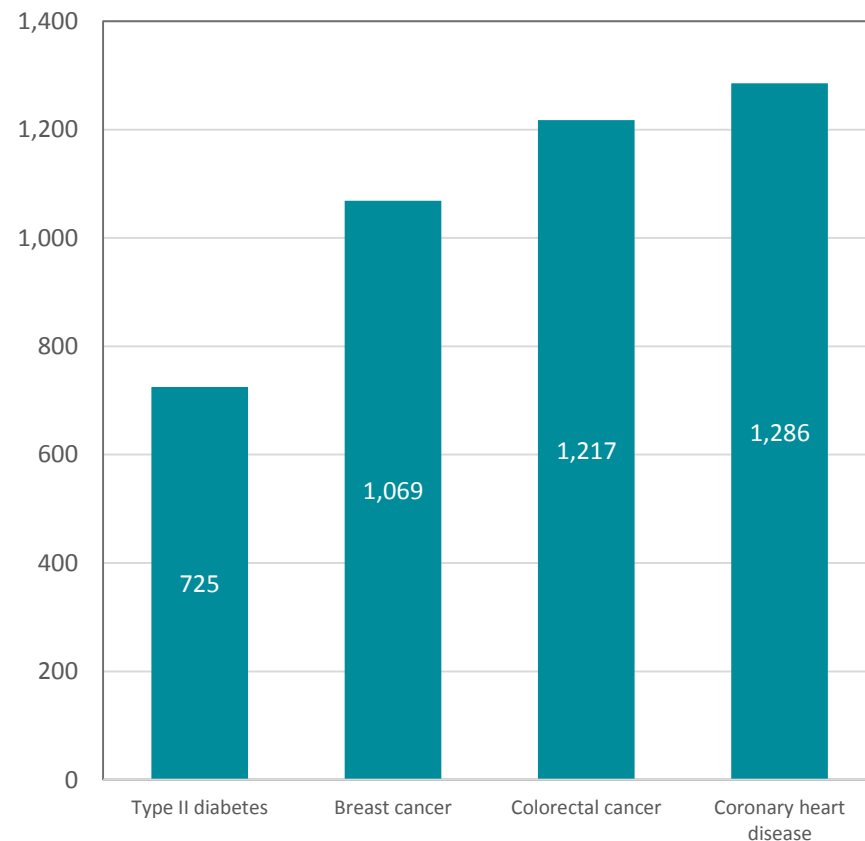
Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

# Indirect costs through physical disorders amount to €4.3 billion per year in France

- Of the four major inactivity-related NCDs considered in the study, the indirect costs of coronary heart disease are the greatest in France, amounting to almost €1.3 billion in 2012. This cost is driven by over 40,000 DALYs lost to inactivity-related CHD in France in that year – underlining the severity of the condition in terms of the healthy life years which are lost as a result of it. The same is true of colorectal and breast cancer, which together imposed indirect costs of €2.3 billion, despite their relatively lower prevalence compared with the other NCDs considered here.
- Meanwhile type II diabetes, by far the most common inactivity-related disorder of the major NCDs examined in this study, sees the lowest indirect costs, of around €725 million. This indicates a comparatively lower burden to the French economy of ill-health and death resulting from inactivity-related diabetes.
- The table below sets out the reductions in indirect costs which could have been achieved if given proportions of inactive French adults had instead engaged in active lifestyles. If this proportion was one-fifth, the indirect costs of inactivity resulting from physical disorders could have been €859 million lower.

Percentage decline in physical inactivity	5%	10%	20%
Breast cancer indirect cost savings (millions)	€ 53	€ 107	€ 214
Colorectal cancer indirect cost savings (millions)	€ 61	€ 122	€ 243
Type II diabetes indirect cost savings (millions)	€ 36	€ 73	€ 145
Coronary heart disease indirect cost savings (millions)	€ 64	€ 129	€ 257

Indirect costs attributable to physical inactivity through physical disorders, France, 2012 (million €)



Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

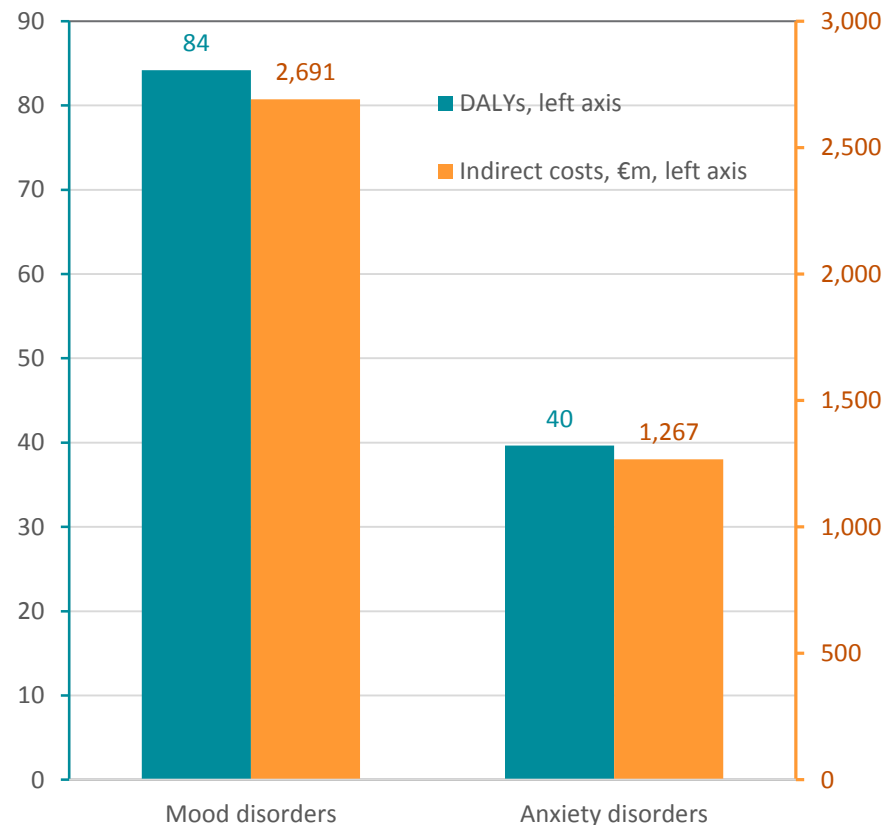
# French inactivity accounts for 124,000 DALYs lost to mood and anxiety disorders

## Mental health and wellbeing

- 12 million people are estimated to suffer from one or more mental disorders in France in 2012. Mental health disorders are estimated to have cost the French healthcare system €13.4 billion (equivalent to 8% of total healthcare expenditure) – encompassing €8.3 billion worth of inpatient care and €4.7 billion in outpatient care. (Chevreul et al., 2012).
- The costs of mental and behavioural disorders to France amounted to 2.4 million DALYs in 2012 (WHO 2014), of which mood and anxiety disorders constituted 1.4 million.
- Increased levels of physical activity are associated with reductions in depressive and anxiety disorders. Evidence from Canada suggests that physical inactivity can account for up to 9.02% of national mood and anxiety disorder prevalence (Meng and D’Arcy, 2013): applying this fraction to France results in approximately 124,000 mood and anxiety disorder DALYs attributable to physical inactivity in 2012. If the prevalence of inactivity in France was to fall by a fifth, this could reduce this total by 25,000.
- Estimating the economic value of these DALYs results in **indirect costs of €4.0 billion**. On this basis, a reduction in the prevalence of inactivity to the tune of 20% could yield cost savings of €198 million.

Percentage decline in physical inactivity	5%	10%	20%
Potential indirect cost savings (millions) from mood and anxiety disorders	€ 198	€ 396	€ 792

Estimated number of DALYs lost due to inactivity-related mood and anxiety disorders in France, thousands; and indirect costs, €m, 2012



Source: Meng & D’Arcy (2013), WHO, Eurostat, Cebr analysis



# *Implications of physical inactivity by country*

France

**Germany**

Italy

Poland

Spain

United Kingdom





# The extent and costs of physical inactivity in Germany

- The proportion of German adults who fail to engage in the recommended levels of physical activity is estimated to be **over a fifth (21%)**. For children and adolescents, the proportion is much higher – reaching **89% for 15-year-olds**. A substantial disparity is seen between the genders – 19% of adult men fail to meet the recommended levels of activity, compared to 25% of adult women.
- As a result, inactivity is estimated as being responsible for 7.5% of all deaths in Germany – equivalent to around **65,200 people in 2012**. These are lives which could have been saved if these individuals had adopted lifestyles involving the requisite levels of physical activity.
- Through its contribution to four major physical disorders, inactivity in Germany imposes **annual direct healthcare costs of €1.7 billion**. These physical disorders also have an impact on the economy through an additional **€7.7 billion in indirect costs** (referring to the estimated economic value of healthy lives lost to disease and premature mortality).
- Inactive lifestyles are also strongly linked to mental health disorders. We estimate that inactivity-related depressive and anxiety disorders result in the loss of around **151,000 disability-adjusted life years (DALYs)** per year in Germany, consistent with an economic cost of **€5.2 billion**.
- Combining these monetary estimates results in **total annual economic costs of €14.5 billion**, equivalent to 4.8% of German health expenditure, nearly €2 billion over Germany's entire budget for foreign aid, or over three times as much as the estimated direct public healthcare expenditure on smoking-related diseases in Germany. This burden to German society could be averted entirely if all inactive persons adopted simple lifestyle changes to incorporate more exercise in their daily or weekly routines. Even interventions to bring just one-fifth of currently inactive German people up to the recommended levels of activity could yield benefits worth more than **€2.9 billion**.
- These sums nonetheless represent substantial under-estimates of the potential benefits of increasing physical activity. The gains from activity are numerous and interrelated – including alleviating stress levels and supporting wellbeing, enhancing productivity, and reducing the likelihood of future health complications. These positive outcomes are interconnected, yielding compounding individual, economic and social benefits which extend **far beyond the monetary sums** discussed above.

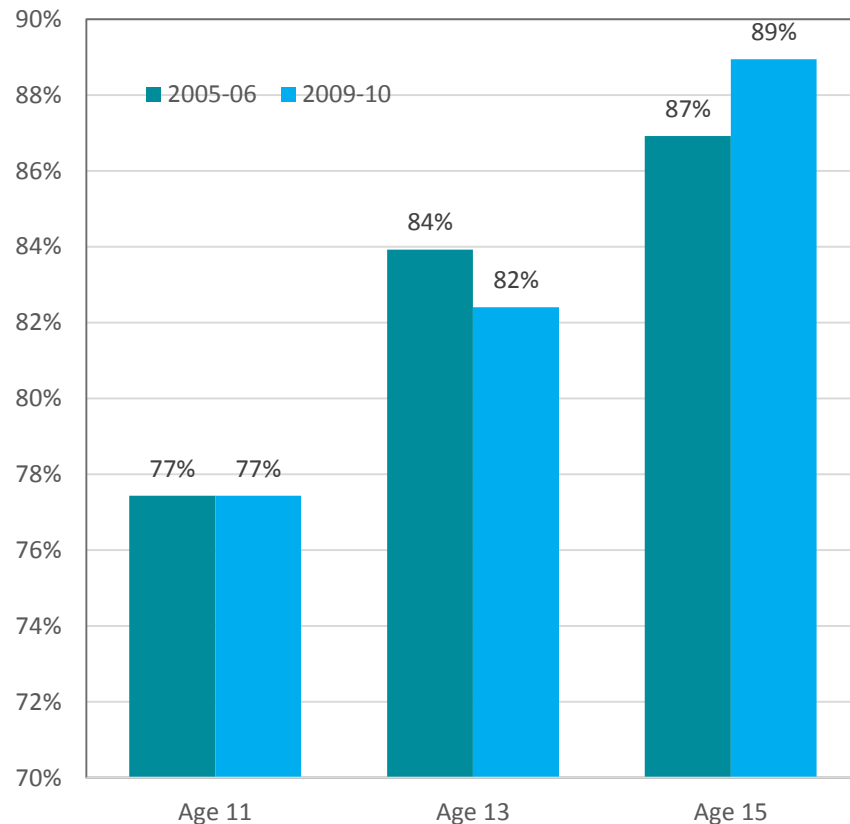
# A fifth of German adults do not achieve the recommended levels of activity

- In 2010, 21.1% of people aged 18 years or older in Germany were estimated by the WHO to be insufficiently inactive. Inactivity levels do not differ as much between the genders in Germany as in some of the other nations in the study: 18.7% of men and 23.5% of women are unlikely to meet the recommended levels of physical activity.
- Among children, the proportion not meeting the recommended guidelines for physical activity is even higher. The proportion of insufficiently active children reaches 80-90% depending on age. The proportion rises with age, meaning that 15-year-olds are less likely to be physically active than 13-year-olds, who in turn are less active than 11-year olds.
- There was a small (two percentage-points) decline in the prevalence of physical inactivity among 13-year-olds between 2005-06 and 2009-10. However, this gain was reversed in older age groups, where the proportion of insufficiently active 15-year-olds reached 89%.

## The costs of inactivity in Germany

- Physical inactivity is a key risk factor to a number of serious illnesses, e.g., coronary heart disease, type II diabetes, some cancers and all-cause mortality. In the following slides, we consider the extent to which physical inactivity impacts upon the prevalence of these diseases in Germany.
- In Germany, the greatest proportional impacts of physical inactivity are upon colorectal cancer cases, in which inactivity accounts for 8.3% of cases. Relative to the other diseases examined in the chart overleaf, physical inactivity makes a smaller contribution to Germany's CHD cases, with just 4.6% of CHD prevalence attributable to inactivity.

Proportion of children that are insufficiently active in Germany, 2005-06 and 2009-10



Source: Currie et al., 2008 and 2012, Cebr analysis

# Cutting inactivity in Germany by a fifth could save 13,000 lives

## Socio-economic factors and physical activity levels

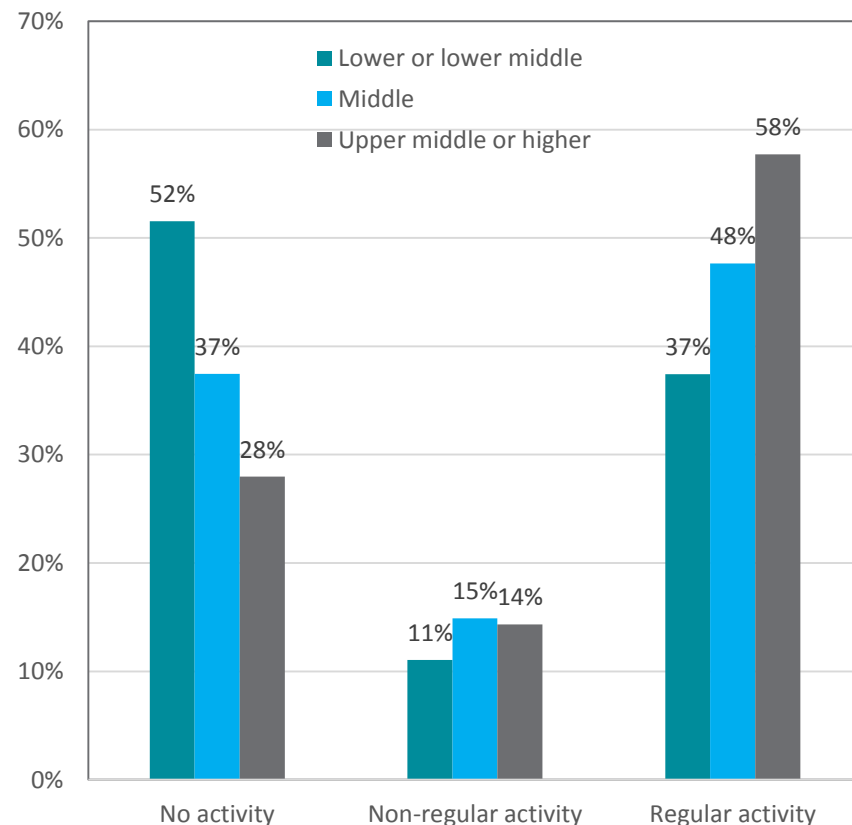
- Evidence suggests that baseline levels of physical activity, and its associated health impacts, vary greatly across socio-economic groups. The chart opposite presents findings from a 2007 study, which shows that young Germans from lower-class backgrounds are significantly less likely to undertake regular exercise than their counterparts from more affluent backgrounds.
- BMI data for German adults also reveals a similar trend: in 2008, 57% of adults in the lowest income quintile were classified as overweight or obese. Among those in the highest income quintile, this proportion was almost ten percentage points lower, at 48%. This underlines that, while inactivity and its resultant disease burdens afflict those of all backgrounds, the problem is especially pronounced among those within less-affluent segments of society.
- This trend is also observed among German children: those from less-affluent families are 34% more likely to not achieve recommended activity levels than their counterparts from highly-affluent families (Borraccino et al., 2010).

## All-cause mortality and life expectancy gains

- Physical inactivity is estimated to be responsible for 7.5% of all deaths in Germany. This implies that if all Germans reached the recommended levels of activity, over 65,200 deaths could potentially have been averted in 2012. Eradicating physical inactivity in this manner would be sufficient to increase average (nationwide) life expectancy of 0.47 years. This is consistent with an increase in life expectancy of 2.61 years on the part of those individuals who are currently insufficiently inactive.
- As physical inactivity is unlikely to be completely eliminated, the table below illustrates the estimated potential deaths that could have averted in 2012 when assuming decreases of physical inactivity prevalence by 5%, 10% and 20%.

Percentage decline in physical inactivity	5%	10%	20%
Estimated potential deaths averted	3,300	6,500	13,000

Physical activity levels of 14-24 year olds in Germany, disaggregated by social class, 2007



Source: A Ströhle et al., 2007

Notes: In the above chart, 'regular' activity is defined as engaging in exercise daily or several times per week; 'non-regular' is defined as 1-4 times per month; and 'no activity' refers to respondents who exercise less than once a month.

# Germany could avert 7,000 cancer cases through reducing inactivity by 20%

## Breast cancer

- 7.4% of breast cancer cases in Germany can be attributed to physical inactivity. The direct healthcare costs of this disease amounted to €2.5 billion in 2012 – this is equivalent to an €185 million burden which is caused by physical inactivity.
- Over 279,000 Germans were estimated to have breast cancer in 2012 (based on 5-year prevalence). If all inactive persons were active, this figure could have fallen by over 20,600. A more achievable reduction, of 20%, could result in 4,100 fewer breast cancer cases: delivering €37.1 million in direct healthcare savings.

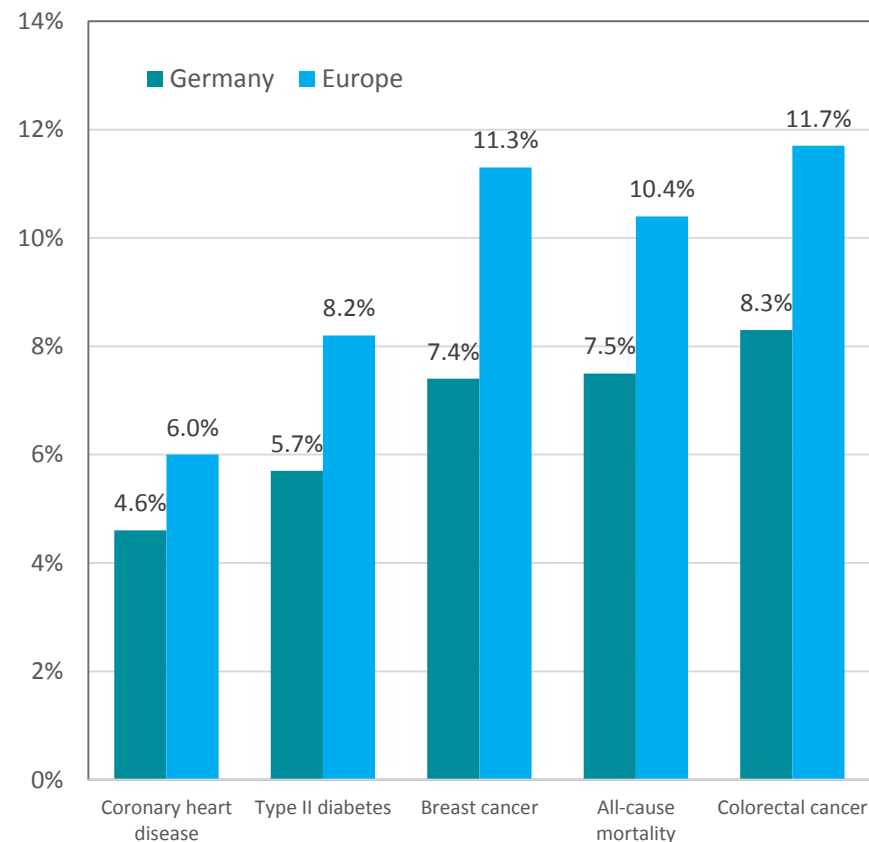
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in breast cancer cases (5-year prevalence)	1,000	2,100	4,100
Potential direct healthcare cost savings (millions)	€ 9.3	€ 18.5	€ 37.1

## Colorectal cancer

- Almost 185,000 people are estimated to have colorectal cancer in Germany (based on 5-year prevalence rates), with an additional 63,600 being diagnosed in 2012 alone. If the prevalence of physical inactivity was reduced by just 5%, nearly 800 cases of colorectal cancer could have been averted. If the decline in inactivity reached 20%, the number of cases could have fallen further, by nearly 3,100.
- €1.8 billion (0.6%) of the national healthcare expenditure in 2012 was directed towards treatment of colorectal cancer. In that year, physical inactivity is estimated to have contributed to €154 million of this burden.

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in colorectal cancer cases (5 year prevalence)	800	1,500	3,100
Potential direct healthcare cost savings (millions)	€ 7.7	€ 15.4	€ 30.7

Estimated population attributable fraction (PAFs) of physical inactivity in major diseases in Germany, 2008



Source: Lee et al., 2012, Cebr analysis

# Direct cost of inactivity in Germany reached €1.7 billion in 2012

## Type II diabetes

- Physical inactivity in Germany is estimated to be responsible for 5.7% of all type II diabetes cases: this amounts to 270,000 diabetes cases which could have been averted if all Germans met recommended guidelines for activity. These diabetes cases which are attributable to physical inactivity are estimated to have presented €1.06 billion in direct healthcare costs to the German healthcare system in 2012.
- A 10% decline in physical inactivity could avoid 27,000 diabetes cases, thereby reducing direct healthcare costs by €106 million.

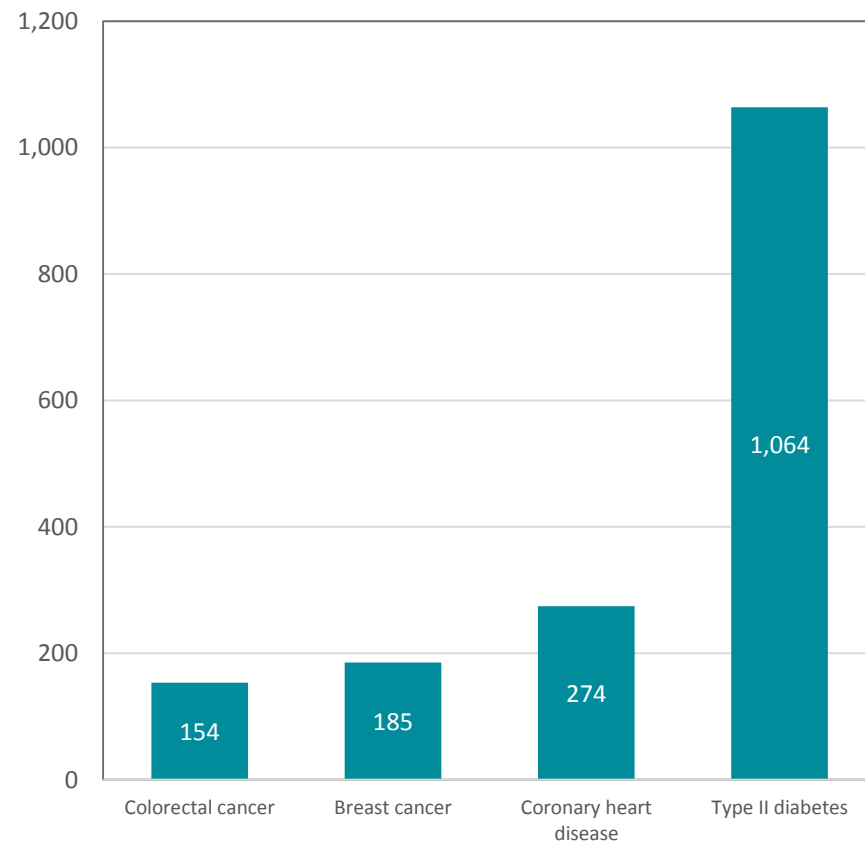
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in type II diabetes cases	13,000	27,000	54,000
Potential direct healthcare cost savings (millions)	€ 53	€ 106	€ 213

## Coronary heart disease

- CHD treatment accounts for around 2% of healthcare expenditure in Germany, equivalent in 2012 to around €6 billion. The share of German CHD cases which are attributable to physical inactivity – around 4.6% – therefore account for an estimated €274 million in direct healthcare costs.
- There were over 729,000 cases of CHD in Germany in 2012. If all Germans reached the recommended guidelines for physical activity, that year could have seen 34,000 fewer CHD cases. Even a much more achievable 5% decline in inactivity could have averted 1,700 CHD cases in that year.

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in CHD cases	1,700	3,400	6,700
Potential direct healthcare cost savings (millions)	€ 14	€ 27	€ 55

Direct healthcare costs attributable to physical inactivity through physical disorders, Germany, 2012 (million €)



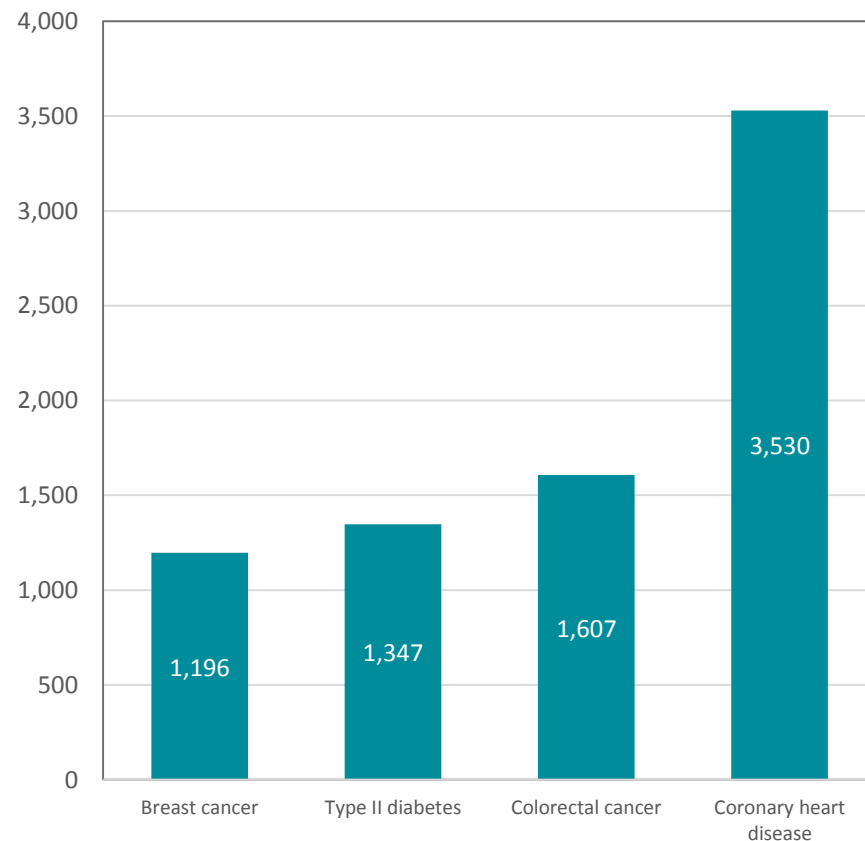
Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

# Indirect costs of inactivity through physical disorders in Germany amount to €7.7 billion annually

- Coronary heart disease generated by far the greatest indirect costs of the four NCDs considered, reaching €3.5 billion in 2012. This is driven by over 100,000 DALYs lost to the disorder as a result of physical inactivity in that year.
- Colorectal cancer contributes a further €1.6 billion per year, despite its lower prevalence in Germany compared with the other considered NCDs. This underlines the severity of this illness and the toll it takes through poor health and premature mortality. Type II diabetes, while much more common than colorectal cancer, imposes a comparable level of indirect costs (of €1.3 billion) – indicating a relatively lower burden to of ill-health and death resulting from inactivity-related diabetes.
- The table below sets out the reductions in indirect costs which could have been achieved, if given proportions of inactive German adults had instead established active lifestyles which met the recommended guidelines for regular physical activity.
- If this proportion was one-fifth, the indirect costs of inactivity resulting from physical disorders could have been €1.5 billion lower. Even a much more achievable reductions of 5% could reduce the indirect costs to the German economy by as much as €384 million per year.

Percentage decline in physical inactivity	5%	10%	20%
Breast cancer indirect cost savings (millions)	€ 60	€ 120	€ 239
Colorectal cancer indirect cost savings (millions)	€ 80	€ 161	€ 321
Type II diabetes indirect cost savings (millions)	€ 67	€ 135	€ 269
Coronary heart disease indirect cost savings (millions)	€ 176	€ 353	€ 706

Indirect costs attributable to physical inactivity through physical disorders, France, 2012 (million €)



Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis



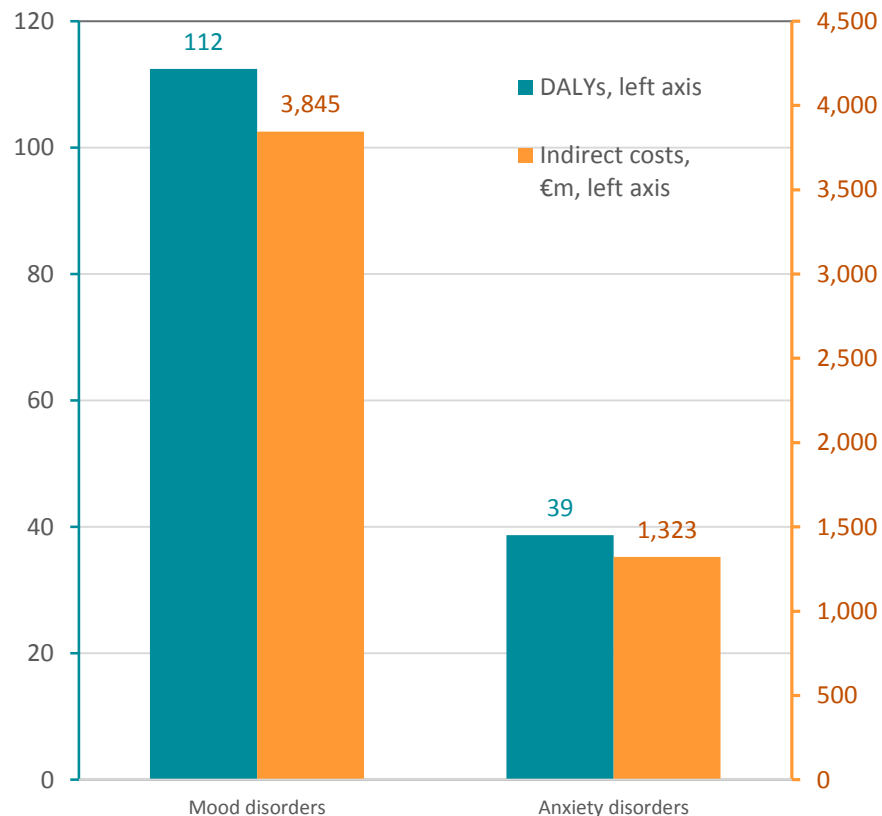
# Inactivity-related mental health disorders in Germany cause €5.2 billion of indirect costs

## Mental health and wellbeing

- Mental and behavioural disorders in Germany made up 12% of the total disease burden in 2012, when measured in DALYs. This was equivalent to almost 3 million DALYs in 2012, of which over half (56%) were due to mood and anxiety disorders.
- Physical activity is associated with reductions in depressive and anxiety disorders. Meng and D’Arcy’s (2013) study estimated that physical inactivity accounted for around 9.02% of the prevalence of mood and anxiety disorders in Canada.
- Applying this fraction in the case of Germany suggests that an estimated 151,000 DALYs which were lost to mood and anxiety disorders were attributable to physical inactivity in 2012.
- The indirect costs associated with the treatment of these mood and anxiety disorder cases amounts to **€5.2 billion annually**. This is high relative to other focus countries in the study, and is driven by the relatively high incidence of DALYs lost to mood and anxiety disorders in Germany; as well as the high productivity of the typical German worker.
- A reduction in the prevalence of physical inactivity to the tune of 20% could see these indirect costs reduced by over €1.0 billion per year.

Percentage decline in physical inactivity	5%	10%	20%
Potential indirect cost savings (millions) from mood and anxiety disorders	€ 258	€ 517	€ 1,033

Estimated number of DALYs lost due to inactivity-related mood and anxiety disorders in Germany, thousands; and indirect costs, €m, 2012



Source: Meng & D’Arcy (2013), WHO, Eurostat, Cebr analysis

# *Implications of physical inactivity by country*

France

Germany

**Italy**

Poland

Spain

United Kingdom



# The extent and costs of physical inactivity in Italy

- The proportion of Italian adults who fail to engage in the recommended levels of physical activity is estimated to be **over a third** (33%). For children and adolescents, the proportion is much higher – reaching **92% for 13-year-olds**. A wide disparity is seen between the genders – 28% of adult men fail to meet the recommended levels of activity, compared to 38% of adult women.
- As a result, inactivity is estimated as being responsible for 14.6% of all deaths in Italy – equivalent to around **88,200 people in 2012**. These are lives which could have been saved if these individuals had adopted lifestyles involving the requisite levels of physical activity.
- Through its contribution to four major physical disorders, inactivity in Italy imposes **annual direct healthcare costs of €1.6 billion**. These physical disorders also have an impact on the economy through an additional **€7.8 billion in indirect costs** (referring to the estimated economic value of healthy lives lost to disease and premature mortality).
- Inactive lifestyles are also strongly linked to mental health disorders. We estimate that inactivity-related depressive and anxiety disorders result in the loss of around **102,000 disability-adjusted life years** (DALYs) per year in Italy, consistent with an economic cost of **€2.8 billion**.
- Combining these monetary estimates results in **total annual economic costs of over €12.1 billion**, equivalent to 8.9% of Italian health expenditure, more than four times Italy's entire foreign aid budget, or four times as much as the estimated direct public healthcare expenditure on smoking-related diseases in Italy. This burden to Italian society could be averted entirely if all inactive persons adopted simple lifestyle changes to incorporate more exercise in their daily or weekly routines. Even interventions to bring just one-fifth of currently inactive Italians up to the recommended levels of activity could yield benefits worth more than **€2.4 billion**.
- These sums nonetheless represent substantial under-estimates of the potential benefits of increasing physical activity. The gains from activity are numerous and interrelated – including alleviating stress levels and supporting wellbeing, enhancing productivity, and reducing the likelihood of future health complications. These positive outcomes are interconnected, yielding compounding individual, economic and social benefits which extend **far beyond the monetary sums** discussed above.

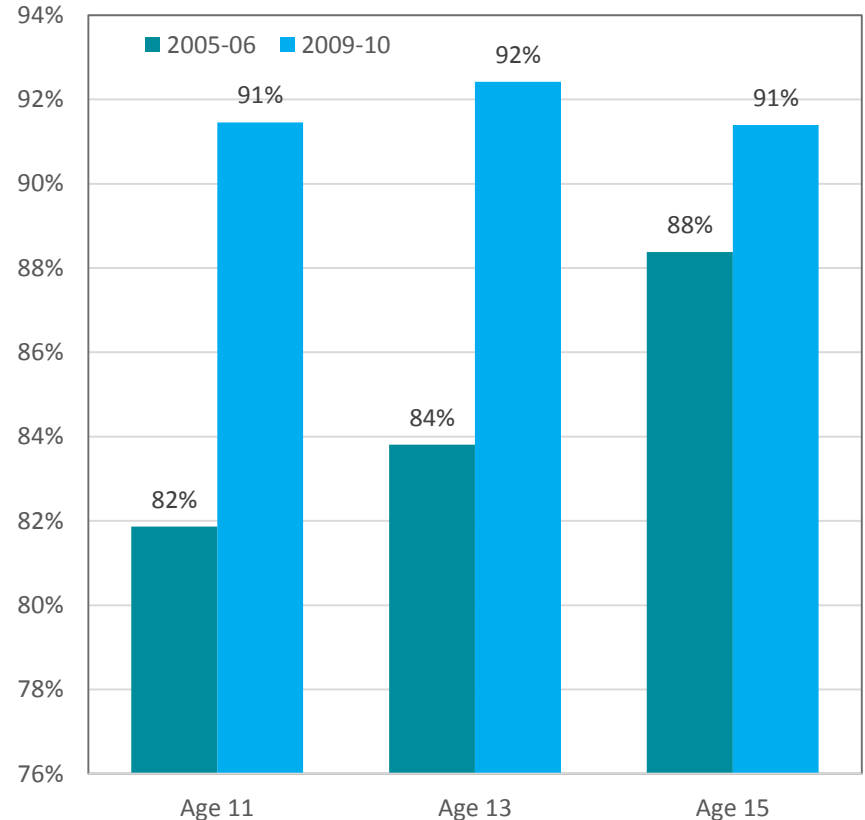
# A third of Italian adults are insufficiently active

- In 2010, a third (33.2%) of Italians aged 18 years or older were estimated to be insufficiently active by the WHO. The prevalence of physical inactivity is 10 percentage points greater amongst Italian women than in men – 38.1% women and 28.2% of men don't meet guideline levels of physical activity.
- Across the six focus countries in the study, Italian children were the most likely to be physically inactive in 2009-10. On average, 92% of children aged between 11 and 15 did not reach the recommended levels of physical activity in 2010.
- Worryingly, Italian children appear to have become markedly less active over the four years between the 2005-06 and 2009-10 data collection rounds. The largest increase was seen in the youngest cohort group, where the prevalence of physical inactivity rose by 9 percentage points.

## The costs of inactivity in Italy

- Physical inactivity is a key risk factor to a number of serious illnesses, i.e., coronary heart disease, type II diabetes and some cancers; as well as all-cause mortality. In the following slides, we consider the extent to which physical inactivity impacts upon the prevalence of these diseases in Italy.
- Across all diseases examined, physical inactivity is accountable for a substantially greater proportion of cases reported in Italy than in Europe. In particular, physical inactivity is accountable for 16.2% of all colorectal cancer cases in Italy – 4.5 percentage points greater than the EU average.
- Relative to the other diseases examined in the chart overleaf, physical inactivity makes a smaller contribution to Italy's CHD cases, with 9.1% of CHD prevalence attributable to inactivity.

Proportion of children that are insufficiently active in Italy, 2005-06 and 2009-10



Source: Currie et al., 2008 and 2012, Cebr analysis

# Curbing inactivity by a fifth could avert 17,600 deaths in Italy

## Socio-economic status influences activity levels

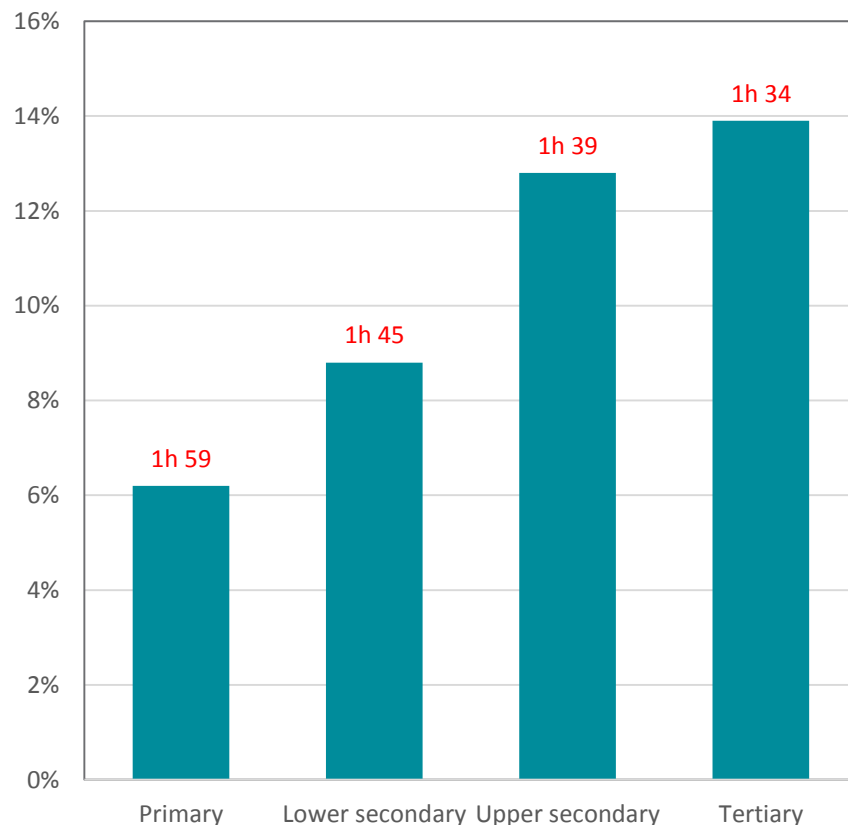
- Participation in physical activity in Italy tends to rise according to socio-economic status. The chart opposite illustrates the proportion of Italian people who participated in sport and other outdoor activities (excluding walking and hiking) in 2000, and the average duration of this activity for those who did participate in it. Just 10.1% of respondents undertook daily sports or other outdoor activities – a proportion which varies from 6.2% among those who have only completed primary education; to 13.9% among those who are educated to tertiary level.
- This suggests that people from less educated backgrounds are significantly less likely to find time to engage in sport or outdoor recreation. However, when examining the *duration* of this sport or physical activity, for those who did partake in it, the higher educated respondents' average durations are markedly lower.
- More recent evidence suggests that this trend is also observed among children: those from less-affluent families are 78% more likely to not achieve recommended activity levels than their counterparts from highly-affluent families (Borraccino et al., 2010).

## All-cause mortality and life expectancy gains

- Physical inactivity is responsible for around 14.6% of all-cause mortality in Italy. This implies that, if all inactive persons across Italy had met their guideline levels for physical activity, well over 88,000 deaths could potentially have been averted in 2012. This eradication of inactivity would be enough to increase national life expectancy by 0.8 years. For those who are currently inactive, the average life expectancy gain is 1.81 years.
- As physical inactivity is unlikely to be completely eliminated, the table below illustrates the estimated potential deaths that could have averted in 2012, when assuming decreases in the prevalence of physical inactivity by 5%, 10% and 20%.

Percentage decline in physical inactivity	5%	10%	20%
Estimated potential deaths averted	4,400	8,800	17,600

Daily participation in sport & outdoor activities in Italy (% of total); and average duration of activity (hh:mm), by highest education attained, 2000



Source: Eurostat, Cebr analysis

Note: Data from Time Use Survey. 'Primary' education refers to ISCED Level 1; 'Lower secondary' refers to ISCED Level 2; 'Upper secondary' encompasses ISCED Levels 3 & 4, 'Tertiary' describes ISCED Levels 5 & 6.

# Over €227 million in direct cancer costs are attributable to physical inactivity

## Breast cancer

- The burden of breast cancer on the Italian healthcare system amounted to €639 million in 2012. It is estimated that physical inactivity accounts for 15.6% of these direct costs – equivalent to €100 million.
- 209,000 Italians were estimated to have breast cancer in 2012 (based on 5-year prevalence), of which 33,000 are attributable to physical inactivity. Modest reductions in inactivity could support substantial reductions in the number of breast cancer cases, and healthcare savings, as shown below:

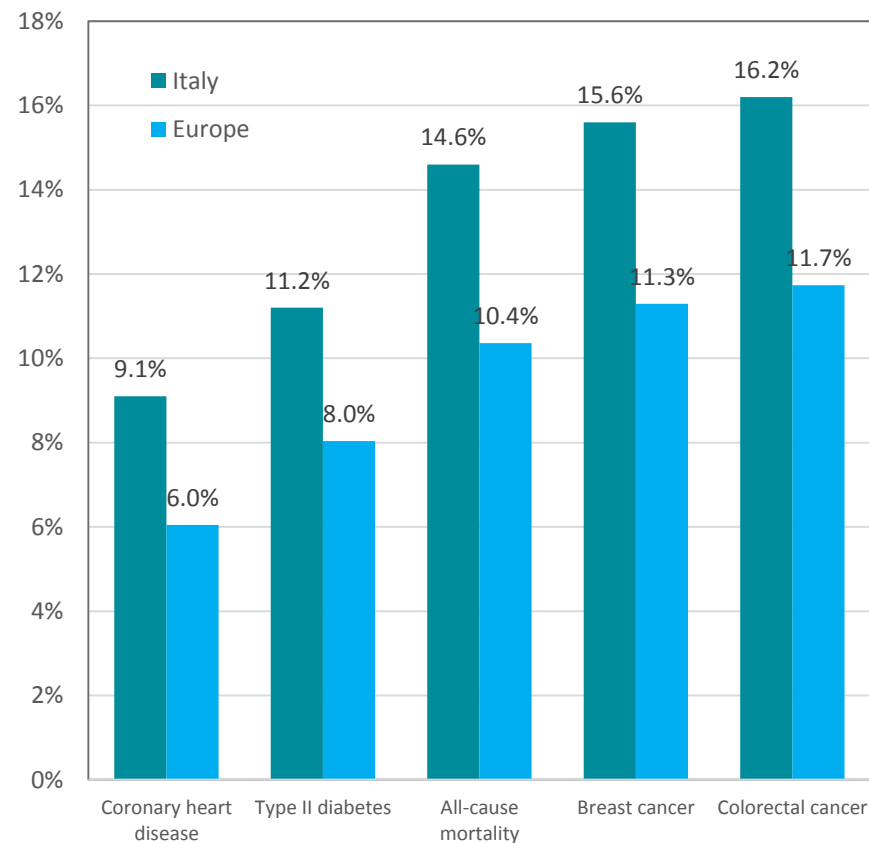
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in breast cancer cases (5-year prevalence)	1,600	3,300	6,500
Potential direct healthcare cost savings (millions)	€ 5.0	€ 10.0	€ 19.9

## Colorectal cancer

- Almost 140,000 people are estimated to have colorectal cancer in Italy, with 0.5% of national healthcare expenditure (equivalent to €786 million in 2012) directed towards its treatment. We estimate that €127 million of these direct healthcare costs are attributable to physical inactivity.
- A modest reduction in physical inactivity – of just 5% – could avert 1,100 cases of colorectal cancer, and save €6.4 million in direct costs to the Italian healthcare system. The potential savings from increasing activity further are summarised below:

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in colorectal cancer cases (5 year prevalence)	1,100	2,300	4,500
Potential direct healthcare cost savings (millions)	€ 6.4	€ 12.7	€ 25.5

Estimated population attributable fraction (PAFs) of physical inactivity in major diseases in Italy and Europe, 2008



Source: Lee et al., 2012, Cebr analysis



# Inactivity-related physical disorders cost the Italian healthcare system €1.6 billion per year

## Type II Diabetes

- Physical inactivity in Italy is estimated to be responsible for 11.2% of all type II diabetes cases – over four percentage points more than the EU average. This is equivalent to 390,000 diabetes cases, which could be prevented if all Italians met their recommended levels of physical activity.
- The direct healthcare cost burden from inactivity-related diabetes cases was estimated at around €1.1 billion in 2012. A modest 10% reduction in physical inactivity could potentially reduce diabetes cases by 39,000 and save €107 million in direct healthcare costs.

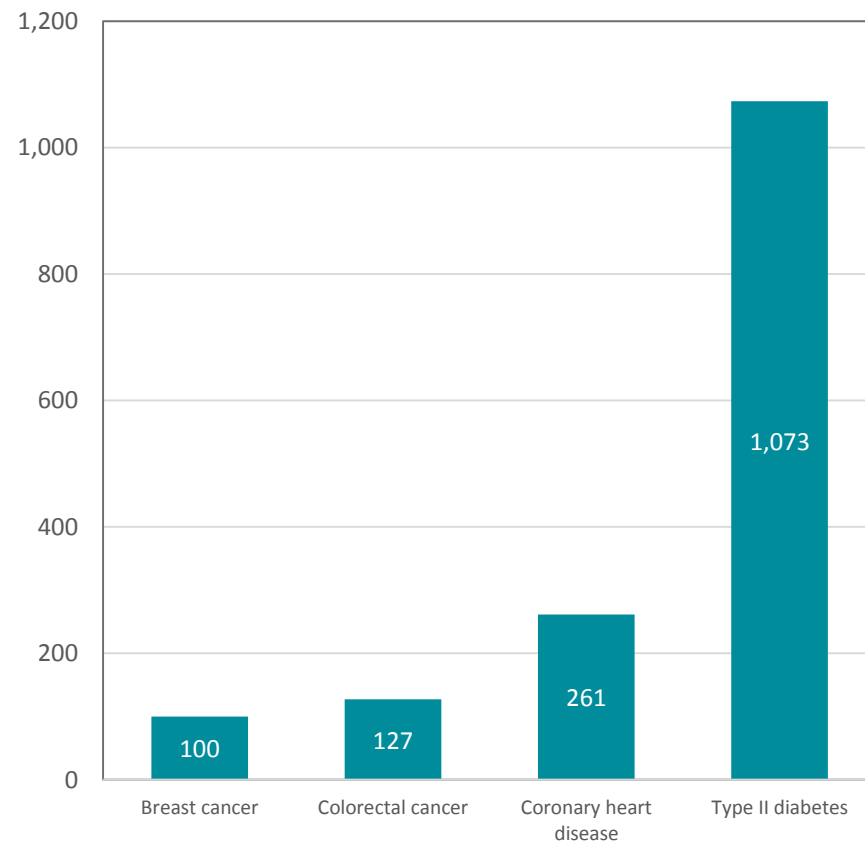
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in type II diabetes cases	20,000	39,000	79,000
Potential direct healthcare cost savings (millions)	€ 54	€ 107	€ 215

## Coronary heart disease

- The direct healthcare costs of CHD in Italy amounted to €2.9 billion in 2012, or around 2% of total Italian healthcare expenditure. With the proportion of cases which are attributable to physical inactivity estimated at 9.1%, this is consistent with a €261 million cost burden of CHD due to inactivity.
- Over 287,000 cases of CHD were reported in Italy in 2012. This implies that if all Italians who are inactive met their recommended activity levels, around 26,100 CHD cases could potentially have been averted. Even a 5% decline in the prevalence of physical inactivity could reduce the number of CHD cases by 1,300, saving €13.1 million in direct costs.

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in CHD cases	1,300	2,600	5,200
Potential direct healthcare cost savings (millions)	€ 13.1	€ 26.1	€ 52.3

Direct healthcare costs attributable to physical inactivity through physical disorders, Italy, 2012 (million €)



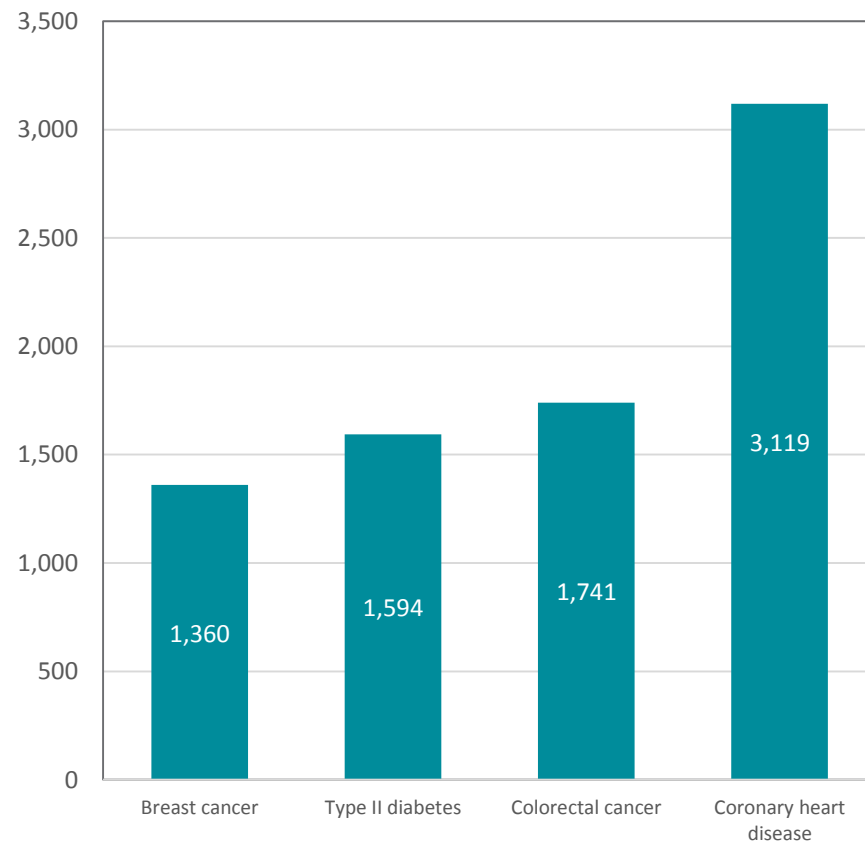
Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

# Indirect cost of inactivity-related physical disorders amounted to €7.8 billion in 2012

- In Italy, coronary heart disease (CHD) is responsible for the largest share of indirect costs resulting from the considered physical disorders. This sum reached €3.1 billion in 2012, underpinned by the 114,000 DALYs lost to this NCD as a result of inactivity in that year.
- Inactivity-related type II diabetes imposed indirect costs of €1.6 billion, marginally less than the €1.7 billion arising as a result of inactivity-attributable colorectal cancer. Despite the lower prevalence of this cancer relative to type II diabetes in Italy, the severity of the disorder means that their cost burdens resulting from inactivity – in the form of ill health and premature mortality – are broadly comparable.
- The indirect costs of breast cancer amounted to €1.4 billion in 2012, driven by the 64,000 DALYs lost to inactivity-attributable breast cancer in Italy during that year.
- The table below sets out the reductions in indirect costs which could have been achieved if given proportions of inactive Italian adults had instead established active lifestyles which met the recommended guidelines for regular physical activity. Reducing the level of inactive Italians by one-fifth could avert indirect costs of €1.6 billion annually. Even a much more achievable reductions of 5% could reduce the indirect costs to the Italian economy by around €400 million per year.

Percentage decline in physical inactivity	5%	10%	20%
Breast cancer indirect cost savings (millions)	€ 68	€ 136	€ 272
Colorectal cancer indirect cost savings (millions)	€ 87	€ 174	€ 348
Type II diabetes indirect cost savings (millions)	€ 80	€ 159	€ 319
Coronary heart disease indirect cost savings (millions)	€ 156	€ 312	€ 624

Indirect costs attributable to physical inactivity through physical disorders, Italy, 2012 (million €)



Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

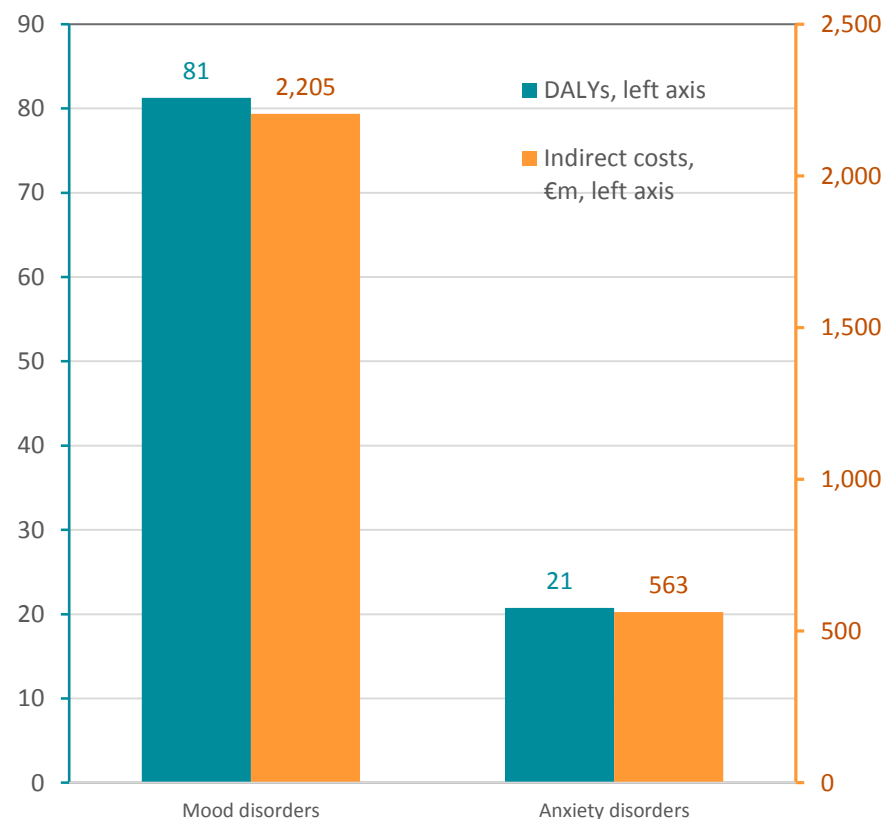
# Over 100,000 DALYs lost to mood and anxiety disorders are attributable to physical inactivity

## Mental health and wellbeing

- The costs of ill mental health in Italy reached 1.7 million DALYs in 2012, which was equivalent to 10% of DALYs lost in that year due to all illnesses. The costs of unipolar depressive and anxiety disorders contributed 1.0 million of these.
- Physical activity is associated with reductions in depressive and anxiety disorders. Meng and D’Arcy (2013) estimate that physical inactivity accounted for around 9.0% of the prevalence of mood and anxiety disorders in Canada. Applying these fractions to Italy suggests that just over 100,000 DALYs lost to mood and anxiety disorders in 2012 were attributable to physical inactivity.
- If the prevalence of inactivity in Italy fell by a fifth, this could have reduced the DALYs lost to these mental health disorders by over 20,000.
- Estimating the economic value of these DALYs results in **indirect costs of €2.8 billion**. On this basis, a reduction in the prevalence of inactivity to the tune of 20% could yield cost savings of €553 million.

Percentage decline in physical inactivity	5%	10%	20%
Potential indirect cost savings (millions) from mood and anxiety disorders	€ 138	€ 277	€ 553

Estimated number of DALYs lost due to inactivity-related mood and anxiety disorders in Italy, thousands, and indirect costs, €m, 2012



Source: Meng & D’Arcy (2013), WHO, Eurostat, Cebr analysis

# *Implications of physical inactivity by country*

France

Germany

Italy

**Poland**

Spain

United Kingdom



# The extent and costs of physical inactivity in Poland

- The proportion of Polish adults who fail to engage in the recommended levels of physical activity is estimated to be **almost a fifth** (18%). A wide disparity is seen between the genders – 14% of adult men fail to meet the recommended levels of activity, compared to 24% of adult women. For children and adolescents, the proportion is much higher – reaching **83% for 15-year-olds**. However, young people in Poland appear to be becoming more active, with the proportions of insufficiently-active young people falling between 2006 and 2010, especially among 11-year-olds.
- Inactivity is estimated as being responsible for 7.4% of all deaths in Poland – equivalent to around **28,500 people in 2012**. These are lives which could have been saved if these individuals had adopted lifestyles involving the requisite levels of physical activity.
- Through its contribution to four major physical disorders, inactivity in Poland imposes **annual direct healthcare costs of €219 million**. These physical disorders also have an impact on the economy through an **additional €1.3 billion in indirect costs** (referring to the estimated economic value of healthy lives lost to disease and premature mortality).
- Inactive lifestyles are also strongly linked to mental health disorders. We estimate that inactivity-related depressive and anxiety disorders result in the loss of around **65,000 disability-adjusted life years** (DALYs) per year in Poland, consistent with an economic cost of **€658 million**.
- Combining these monetary estimates results in **total annual economic costs of over €2.2 billion**, equivalent to 8.4% of Polish healthcare spending, more than five times Poland's entire foreign aid budget, or over three times as much as the estimated direct public healthcare expenditure on smoking-related diseases in Poland. This burden to Polish society could be averted entirely if all inactive persons adopted simple lifestyle changes to incorporate more exercise in their daily or weekly routines. Even interventions to bring just one-fifth of currently inactive Polish people up to the recommended levels of activity could yield benefits worth **€435 million**.
- These sums nonetheless represent substantial under-estimates of the potential benefits of increasing physical activity. The gains from activity are numerous and interrelated – including alleviating stress levels and supporting wellbeing, enhancing productivity, and reducing the likelihood of future health complications. These positive outcomes are interconnected, yielding compounding individual, economic and social benefits which extend **far beyond the monetary sums** discussed above.

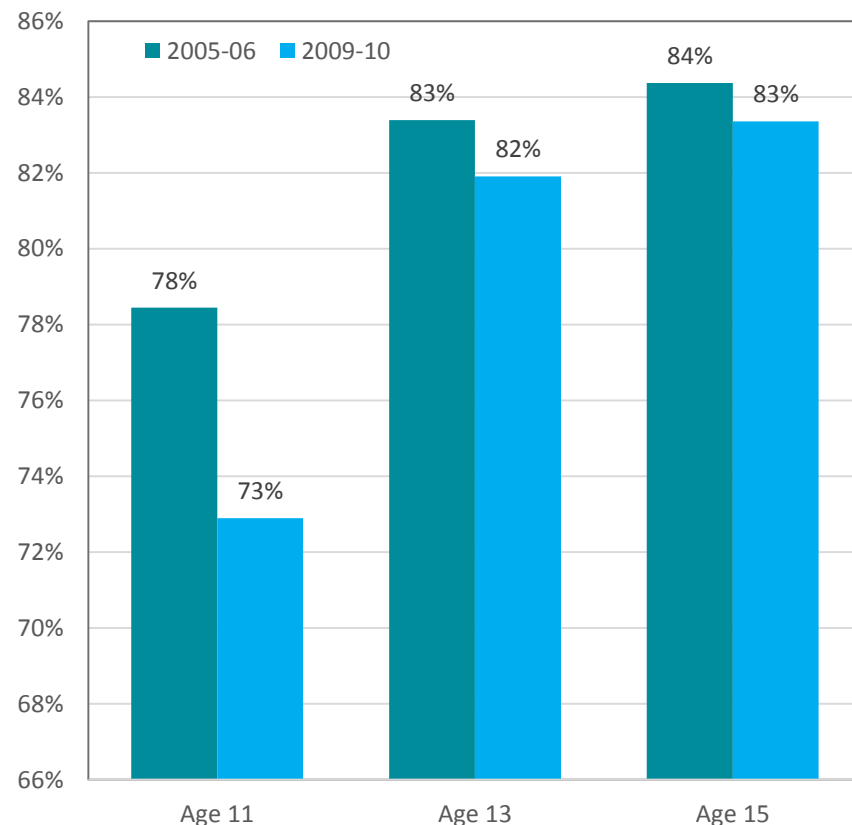
# The prevalence of physical inactivity is lowest in Poland

- In 2010, 18.7% of those aged 18 years or older in Poland were estimated by the WHO to be insufficiently inactive. This is the lowest level of adult inactivity among the focus countries of this study. However, there is a large disparity between the genders, with around a quarter (23.8%) of Polish women failing to meet the recommended activity guidelines, compared with 13.6% of Polish men.
- The picture is not so bright for children and young people, with around 80% of those aged between 11 and 15 failing to meet physical activity recommendations for children in 2009-10.
- However, the prevalence of physical inactivity fell across all age groups in the four years between 2005-06 and 2009-10. The largest decrease has been seen in the youngest group: the proportion of insufficiently active Polish 11-year-olds fell by 5 percentage points in this timeframe.

## The costs of inactivity in Poland

- Physical inactivity is a key risk factor for a number of serious illnesses, e.g., coronary heart disease, type II diabetes, some cancers; as well as all-cause mortality. In the following slides, we consider the extent to which physical inactivity impacts upon the prevalence of these diseases in Poland.
- Across all diseases examined, physical inactivity contributes a smaller proportion of cases in Poland than in Europe. The largest divergence is in the case of colorectal cancers, where physical inactivity accounts for 8.2% of cases in Poland – 3.5 percentage points lower than the EU average.
- In Poland, the greatest proportional impacts of physical inactivity are upon breast and colorectal cancer cases, in which inactivity accounts for 8.2% of cases for both diseases. Relative to the other diseases examined in the chart overleaf, physical inactivity makes a smaller contribution to Poland's CHD cases, with just 4.6% of CHD prevalence attributable to inactivity.

Proportion of children that are insufficiently active in Poland, 2005-06 and 2009-10



Source: Currie et al., 2008 and 2012, Cebr analysis



# A reduction in physical inactivity of 20% could avert 5,700 deaths

## Affluent social segments are more likely to be of healthy weight

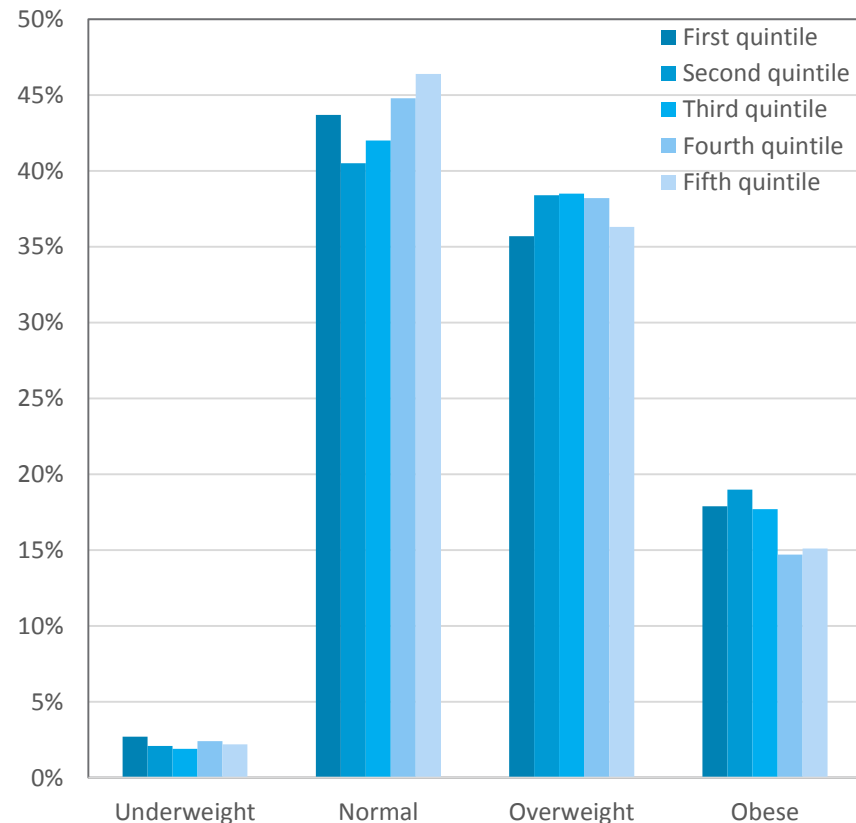
- BMI data for Polish adults reveal that those who are on the higher end of the income distribution are more likely to be of normal healthy weight. In 2008, 15% of adults in the top two income quintiles were classified as obese, compared with 18% in the lowest two income quintiles.
- While BMI undoubtedly has limitations as a measure of physical health, this hints at some of the socio-economic features of the problem of physical inactivity. As those from less affluent income groups tend to be less physically active, the resultant burden of poor physical and mental health can weigh disproportionately upon the more disadvantaged segments of society.
- This trend is observed among Polish children, also: those from less-affluent families are 50% more likely to not achieve recommended activity levels than their counterparts from highly-affluent families (Borraccino et al., 2010).

## All-cause mortality and life expectancy gains

- Physical inactivity has been estimated to be responsible for 7.4% of all deaths in Poland. This implies that if all inactive persons across Poland had been active, 28,500 deaths could have been averted in 2012.
- This level of activity would also be sufficient to increase average life expectancy across Poland, to the tune of 0.6 years. For insufficiently active individuals who become active, the estimated life expectancy gains are much larger – around 4.17 years on average.
- Since physical inactivity is unlikely to be completely eliminated, the table below sets out estimates for the number of deaths that could have been averted in 2012, had the level of physical inactivity in Poland been 5%, 10% and 20% lower.

Percentage decline in physical inactivity	5%	10%	20%
Estimated potential deaths averted	1,400	2,800	5,700

Percentage of Polish adults with body mass index (BMI) which fall within given ranges, by income quintile, 2008



Source: Eurostat, Cebr analysis

Note: 'Underweight' refers to a BMI of less than 18.5; 'Normal' describes BMI between 18.5 and 25; 'Overweight' refers to a BMI of more than 25 and less than 30; while 'Obese' refers to BMIs of greater than 30.

# The direct costs of inactivity-related cancers in Poland amount to €31 million per year

## Breast cancer

- The cost burden of breast cancer upon the Polish healthcare system is estimated at €183 million in 2012. Physical inactivity is accountable for around 8.2% of these cases, thereby contributing an estimated €15 million to direct healthcare costs in 2012.
- 67,900 people in Poland were estimated to have breast cancer in 2012. The total elimination of physical inactivity could therefore give rise to 5,600 fewer breast cancer cases. The potential impacts of more modest and achievable reductions are set out below:

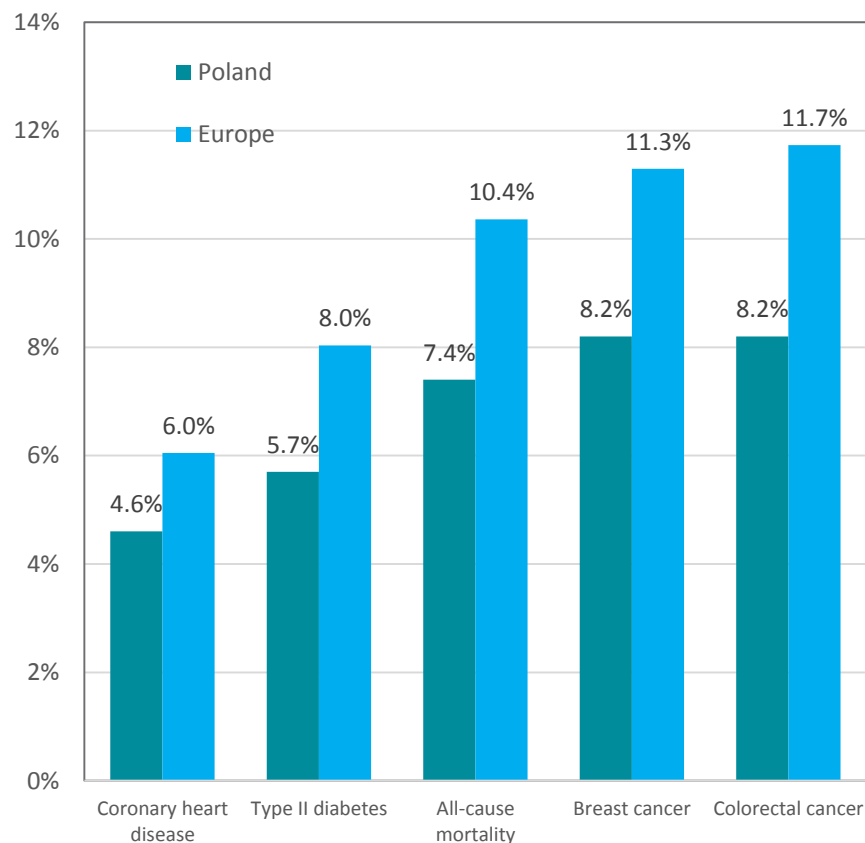
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in breast cancer cases (5-year prevalence)	300	600	1,100
Potential direct healthcare cost savings (millions)	€ 0.8	€ 1.5	€ 3.0

## Colorectal cancer

- In 2012, almost 44,700 people were estimated to have colorectal cancer in Poland (based on 5-year prevalence). If the prevalence of physical inactivity in Poland was reduced by just 5%, an estimated 200 cases of colorectal cancer could have been averted – a number which rises to 700 if inactivity were 20% lower.
- Around 0.8% of Poland’s healthcare expenditure is directed towards colorectal cancer treatment, equivalent to €194 million in 2012. The portion of these costs which are attributable to physical inactivity is estimated at €16 million, with reductions in physical inactivity yielding cost savings as follows:

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in colorectal cancer cases (5 year prevalence)	200	400	700
Potential direct healthcare cost savings (millions)	€ 0.8	€ 1.6	€ 3.2

Estimated population attributable fraction (PAFs) of physical inactivity in major diseases in Poland and Europe, 2008



Source: Lee et al., 2012, Cebr analysis

# The total direct costs of inactivity reached €219 million in 2012

## Type II diabetes

- Physical inactivity is estimated to be responsible for 5.7% of all type II diabetes cases in Poland. This is equivalent to 160,000 cases, all of which could potentially be prevented if all Polish people met their recommended guidelines for physical activity.
- The direct costs of physical inactivity-related diabetes are estimated at €141 million in 2012. Even a 10% decline in physical inactivity could potentially result in direct healthcare costs savings of €14 million, as shown below:

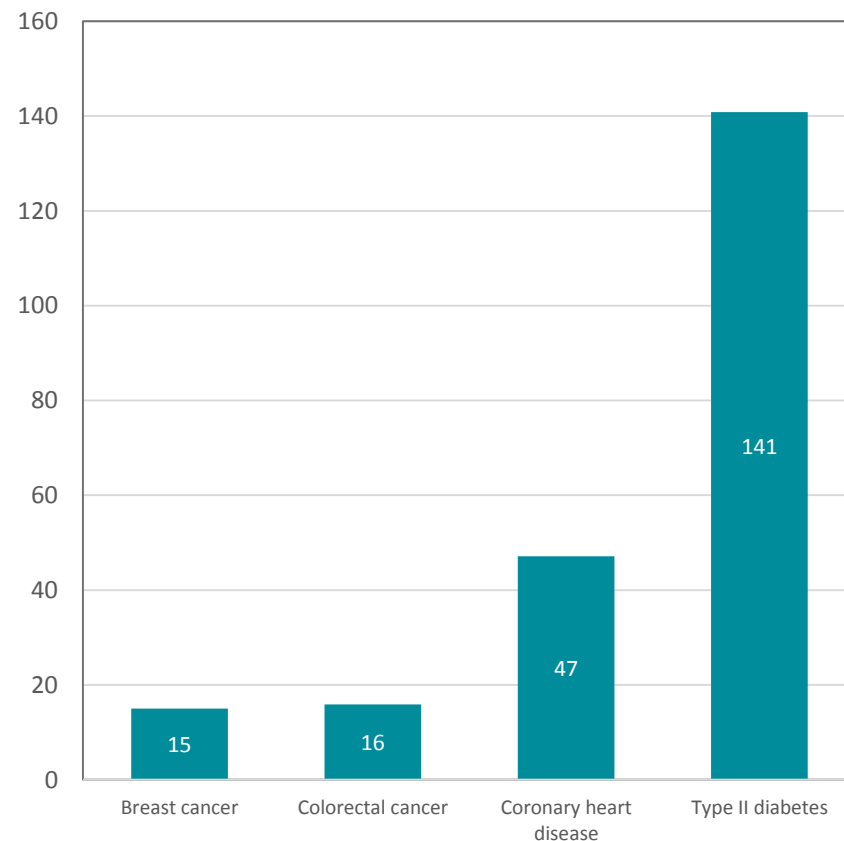
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in type II diabetes cases	8,000	16,000	32,000
Potential direct healthcare cost savings (millions)	€ 7	€ 14	€ 28

## Coronary heart disease

- The cost of CHD in Poland amounted to €1.02 billion in 2012, equivalent to around 4% of total healthcare expenditure. In that year, the fraction of CHD which is attributable to physical inactivity is estimated to have cost the country €47 million.
- In 2012, over 272,00 people were reported to have CHD in Poland. If all Polish persons had met the relevant guidelines for physical activity, around 12,500 cases could have been averted in 2012 – even a modest 5% decline in physical inactivity could reduce CHD cases by almost 1,300 and save €2.4 million in direct costs.

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in CHD cases	600	1,300	2,500
Potential direct healthcare cost savings (millions)	€ 2.4	€ 4.7	€ 9.4

Direct healthcare costs attributable to physical inactivity through physical disorders, Poland, 2012 (million €)



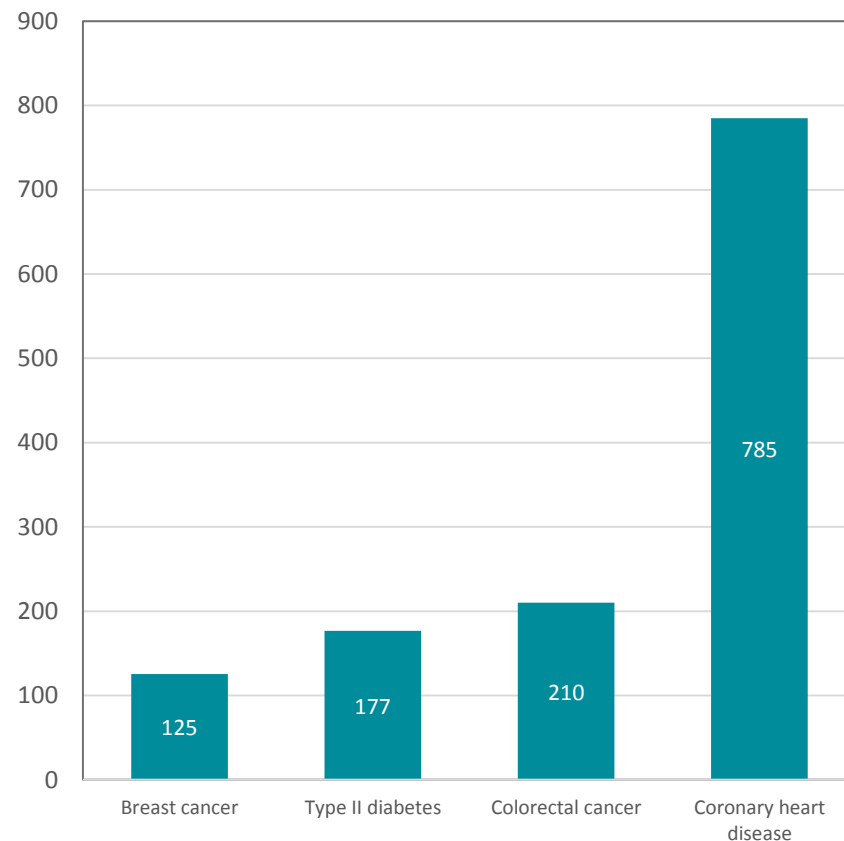
Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

# Indirect cost of inactivity through physical disorders amounted to €1.3 billion in 2012

- Coronary heart disease contributes by far the largest indirect costs of inactivity resulting from the considered physical disorders. In Poland, this sum reached €785 million in 2012, reflecting the 77,000 DALYs lost to this NCD as a result of inactivity in that year.
- Inactivity-related colorectal cancer imposed indirect costs of €210 million, more than the €177 million which arises as a result of inactivity-attributable type II diabetes. Despite the lower prevalence of colorectal cancer relative to diabetes in Poland, the severity of the disorder means that their cost burdens resulting from inactivity – in the form of ill health and premature mortality – are broadly comparable.
- The indirect costs of breast cancer amounted to €125 million in 2012, driven by nearly 21,000 DALYs lost to inactivity-attributable breast cancer in Poland during that year.
- The table below sets out the reductions in indirect costs which could have been achieved, if given proportions of inactive Polish adults had succeeded in establishing active lifestyles, which met the recommended guidelines for regular physical activity.
- Reducing the level of inactive Polish adults by one-fifth could avert indirect costs of €259 million annually. Even a much more achievable reduction of 5% could reduce the indirect costs to the Polish economy by around €65 million per year.

Percentage decline in physical inactivity	5%	10%	20%
Breast cancer indirect cost savings (millions)	€ 6	€ 13	€ 25
Colorectal cancer indirect cost savings (millions)	€ 10	€ 21	€ 42
Type II diabetes indirect cost savings (millions)	€ 9	€ 18	€ 35
Coronary heart disease indirect cost savings (millions)	€ 39	€ 79	€ 157

Indirect costs attributable to physical inactivity through physical disorders, Poland, 2012 (million €)



Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

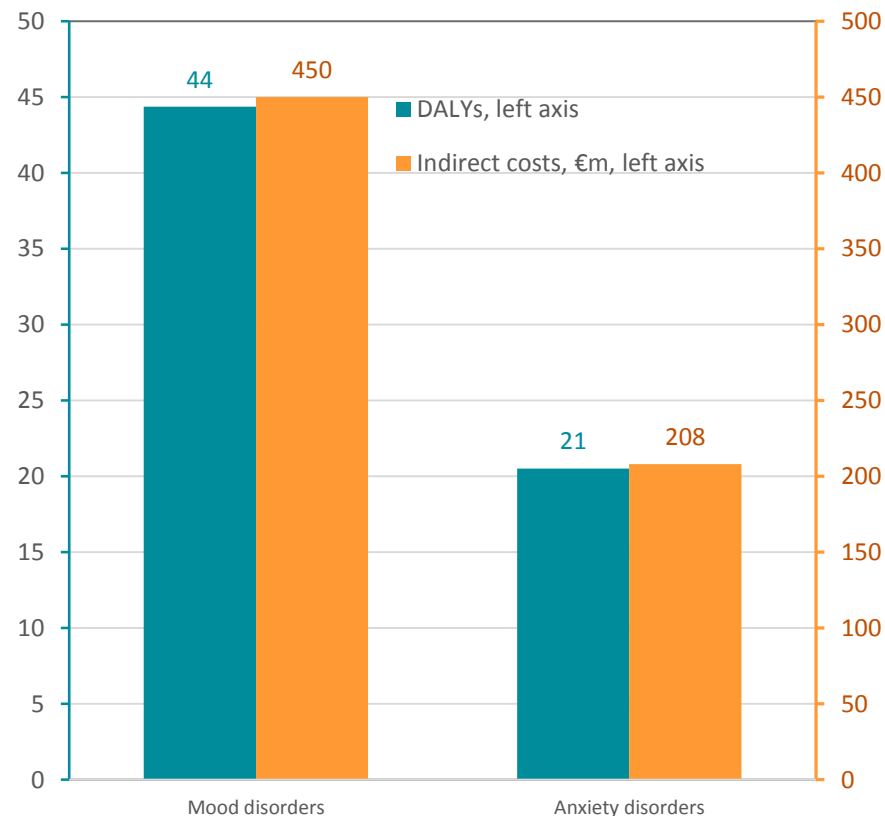
# Inactivity linked to 65,000 DALYs lost to mental disorders in Poland

## Mental health and wellbeing

- Mental ill health in Poland cost the country 1.4 million DALYs in 2012, which was equivalent to 11% of total DALYs lost as a result of all illnesses. The cost of unipolar depressive and anxiety disorders accounted for roughly 640,000 of these.
- Physical activity is associated with reductions in depressive and anxiety disorders. Meng and D’Arcy (2013) estimate that physical inactivity accounted for around 9.0% of the prevalence of mood and anxiety disorders in Canada. Applying these fractions to Poland suggests that almost 65,000 DALYs lost to these disorders could be attributable to physical inactivity in 2012.
- If a 20% reduction in levels of physical inactivity was achieved in Poland in that year, it could have reduced the number of disorders mood disorder cases by 510.
- Estimating the economic value of these DALYs results in **indirect costs of €658 million**. On this basis, a reduction in the prevalence of inactivity to the tune of 20% could yield cost savings of €132 million.

Percentage decline in physical inactivity	5%	10%	20%
Potential indirect cost savings (millions) from mood and anxiety disorders	€ 33	€ 66	€ 132

Estimated number of DALYs lost due to inactivity-related mood and anxiety disorders in Poland, thousands; and indirect costs, €m, 2012



Source: Meng & D’Arcy (2013), WHO, Eurostat, Cebr analysis



# *Implications of physical inactivity by country*

France

Germany

Italy

Poland

**Spain**

United Kingdom





# The extent and costs of physical inactivity in Spain

- The proportion of Spanish adults who fail to engage in the recommended levels of physical activity is estimated to be **over a quarter** (30%). For children and adolescents, the proportion is much higher – reaching **83% for 15-year-olds**. However, young people in Spain appear to be becoming more active, with the proportions of insufficiently-active young people falling between 2006 and 2010.
- Inactivity is estimated as being responsible for 7.4% of all deaths in Spain – equivalent to around **54,000 people in 2012**. These are lives which could have been saved if these individuals had adopted lifestyles involving the requisite levels of physical activity.
- Through its contribution to four major physical disorders, inactivity in Spain imposes **annual direct healthcare costs of over €990 million**. These physical disorders also have an impact on the economy through an additional **€4.1 billion in indirect costs** (referring to the estimated economic value of healthy lives lost to disease and premature mortality).
- Inactive lifestyles are also strongly linked to mental health disorders. We estimate that inactivity-related depressive and anxiety disorders result in the loss of around **68,000 disability-adjusted life years (DALYs)** per year in Spain, consistent with an economic cost of **€1.5 billion**.
- Combining these monetary estimates results in **total annual economic costs of over €6.6 billion**, equivalent to 6.9% of Spanish health spending, more than three times Spain's entire foreign aid budget, or nearly four times as much as the estimated direct public healthcare costs on smoking-related diseases in Spain. This burden to Spanish society could be averted entirely if all inactive persons adopted simple lifestyle changes to incorporate more exercise in their daily or weekly routines. Even interventions to bring just one-fifth of currently inactive Spaniards up to the recommended levels of activity could yield benefits worth **€1.3 billion per year**.
- These sums nonetheless represent substantial under-estimates of the potential benefits of increasing physical activity. The gains from activity are numerous and interrelated – including alleviating stress levels and supporting wellbeing, enhancing productivity, and reducing the likelihood of future health complications. These positive outcomes are interconnected, yielding compounding individual, economic and social benefits which extend **far beyond the monetary sums** discussed above.

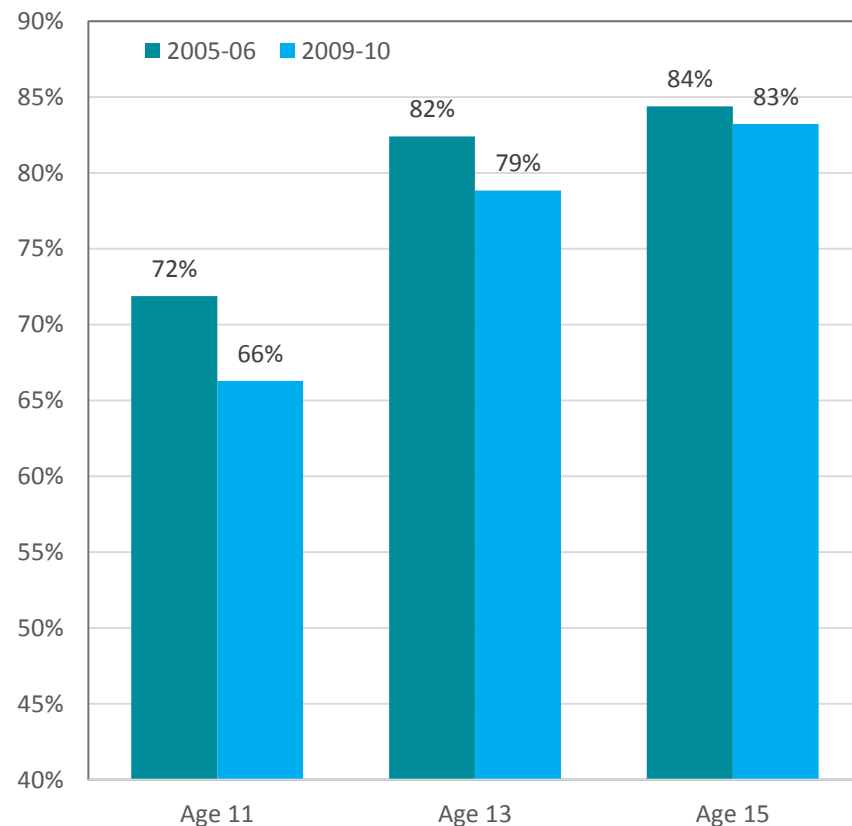
# Over three-quarters of Spanish children are insufficiently active

- The WHO estimates that in 2010, 30.5% of those aged 18+ in Spain were insufficiently inactive. Spanish women are less likely to meet the recommended levels of physical activity than men – 33.7% women and 27.2% of men did not meet the recommended levels of physical activity.
- Furthermore, on average, 77% of children aged between 11 and 15 did not meet the physical activity recommendations in 2009-10. However, the prevalence of physical inactivity fell across all age groups in the four years between 2005-06 and 2009-10. The largest decrease has been seen in the youngest cohort, where the proportion of insufficiently-active 11-year-olds decreased by 6 percentage points.

## The costs of inactivity in Spain

- Physical inactivity is a key risk factor to a number of serious illnesses, i.e., coronary heart disease, type II diabetes and some cancers; as well as all-cause mortality. In the following slides, we consider the extent to which physical inactivity impacts upon the prevalence of these diseases in Spain.
- Across all diseases examined, physical inactivity is accountable for a substantially larger proportion of cases reported in Spain than in Europe. In particular, physical inactivity is accountable for 14.9% of all breast cancer cases in Spain – 3.6 percentage points higher than the EU average.
- Relative to the other diseases examined in the chart overleaf, physical inactivity makes a smaller contribution to Spain's CHD cases, with 8.3% of CHD prevalence attributable to inactivity.

Proportion of children that are insufficiently active in Spain, 2005-06 and 2009-10



Source: Currie et al., 2008 and 2012, Cebr analysis

# Cutting Spanish inactivity by a fifth could avert 10,800 deaths

## Socio-economic segments and physical health

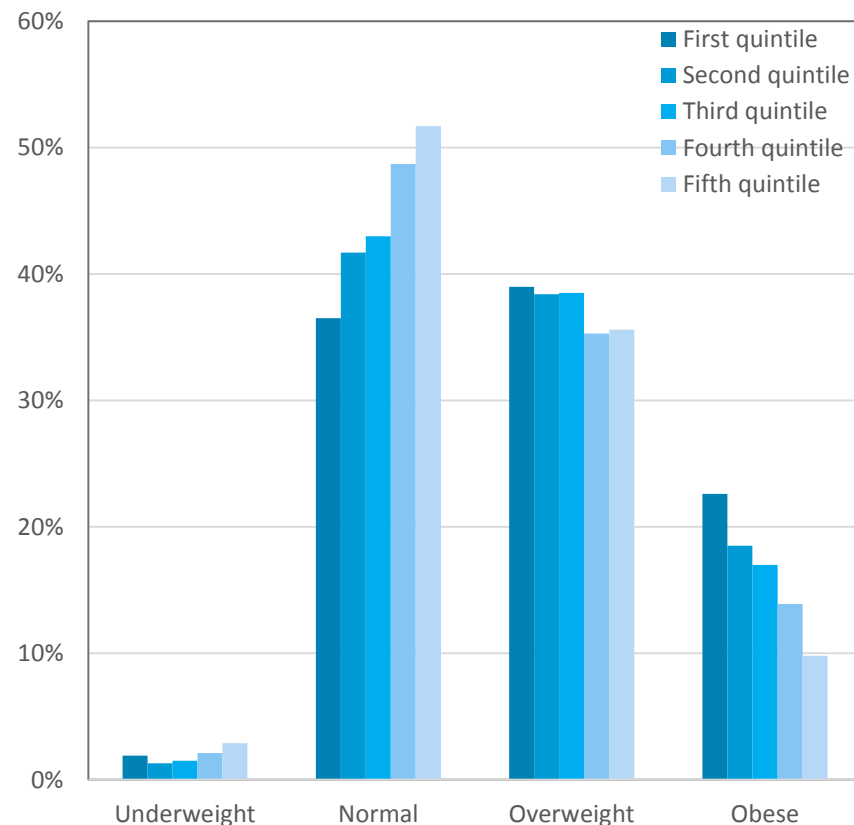
- BMI data for Spanish adults reveal that higher-earning individuals are much more likely to be of normal healthy weight. In 2008, 9.8% of adults in the top income quintile were classified as obese, compared with 22.6% of those in the lowest income quintile. Over half (51.7%) of adults in the highest income quintile were of 'normal' weight, a proportion which falls to just over a third (36.5%) for those in the bottom income quintile.
- While BMI doubtless has limitations as a measure of physical health, this hints at some of the socio-economic features of public health problems, including that of physical inactivity. As those from less affluent income groups tend to be less physically active, the resultant burden of poor physical and mental health can weigh disproportionately upon more disadvantaged segments of society.
- This trend can also be observed among young people in Spain: Spanish children those from less-affluent families are 47% more likely to not achieve recommended activity levels than their counterparts from highly-affluent families (Borraccino et al., 2010).

## All-cause mortality and life expectancy gains

- Physical inactivity is responsible for 13.4% of all deaths in Spain. This implies that if all Spaniards met the recommended guideline levels of physical activity, 54,000 deaths could potentially have been averted in 2012.
- Increasing activity levels in this manner would be consistent with an increase in nationwide life expectancy of 0.78 years. The increase for inactive people who become active is higher, amounting to 1.54 years. As physical inactivity is unlikely to be completely eliminated, the table below contains estimates for the deaths that could have potentially been averted in 2012, if the prevalence of physical inactivity were 5%, 10% and 20% lower:

Percentage decline in physical inactivity	5%	10%	20%
Estimated potential deaths averted	2,700	5,400	10,800

% of Spanish adults with body mass index (BMI) which fall within given ranges, by income quintile, 2008



Source: Eurostat, Cebr analysis

Note: 'Underweight' refers to a BMI of less than 18.5; 'Normal' describes BMI between 18.5 and 25; 'Overweight' refers to a BMI of more than 25 and less than 30; while 'Obese' refers to BMIs of greater than 30.

# Direct cost of inactivity-related cancers €139 million in 2012

## Breast cancer

- The direct costs of treating breast cancer in Spain are estimated at €518 million in 2012. With physical inactivity accountable for around 14.9% of breast cancer prevalence, the proportion of these healthcare costs which are attributable to inactivity amounts to around to €77 million.
- Over 104,000 people in Spain were estimated to have breast cancer in 2012. If all Spaniards were sufficiently active and inactivity was therefore not contributing to breast cancer prevalence, there could have been around 15,500 fewer breast cancer cases in that year.

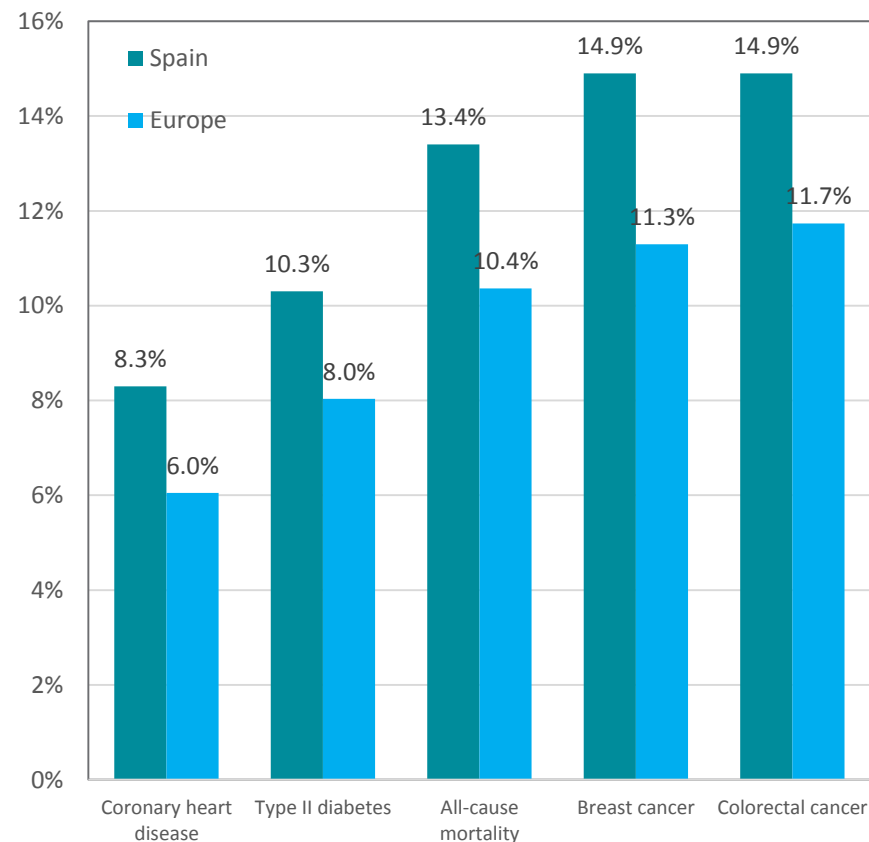
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in breast cancer cases (5-year prevalence)	800	1,600	3,100
Potential direct healthcare cost savings (millions)	€ 3.9	€ 7.7	€ 15.4

## Colorectal cancer

- Almost 89,700 people are estimated to have colorectal cancer in Spain, with around €414 million of national healthcare expenditure being directed towards its treatment in 2012. Based on the proportion of this disease which is attributable to physical inactivity, we estimate that inactivity-related colorectal cancer expenditure amounted to €62 million in that year.
- If the prevalence of physical inactivity in Spain was just 5% lower, an estimated 700 cases of colorectal cancer could be averted.

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in colorectal cancer cases (5 year prevalence)	700	1,300	2,700
Potential direct healthcare cost savings (millions)	€ 3.1	€ 6.2	€ 12.3

## Estimated population attributable fraction (PAFs) of physical inactivity in major diseases in Spain and Europe, 2008



Source: Lee et al., 2012, Cebr analysis

# Direct costs of inactivity-related physical disorders reach €992 million annually in Spain

## Type II diabetes

- In Spain, physical inactivity is estimated to be responsible for 10.3% of all type II diabetes cases. This is equivalent to 300,000 diabetes cases which could potentially be prevented if Spaniards were sufficiently active.
- The direct healthcare costs due to physical inactivity-related diabetes is estimated at around €769 million in 2012. Even a modest 10% decline in physical inactivity could have resulted in direct healthcare costs savings of €77 million in that year, through a reduction in diabetes cases of almost 30,000:

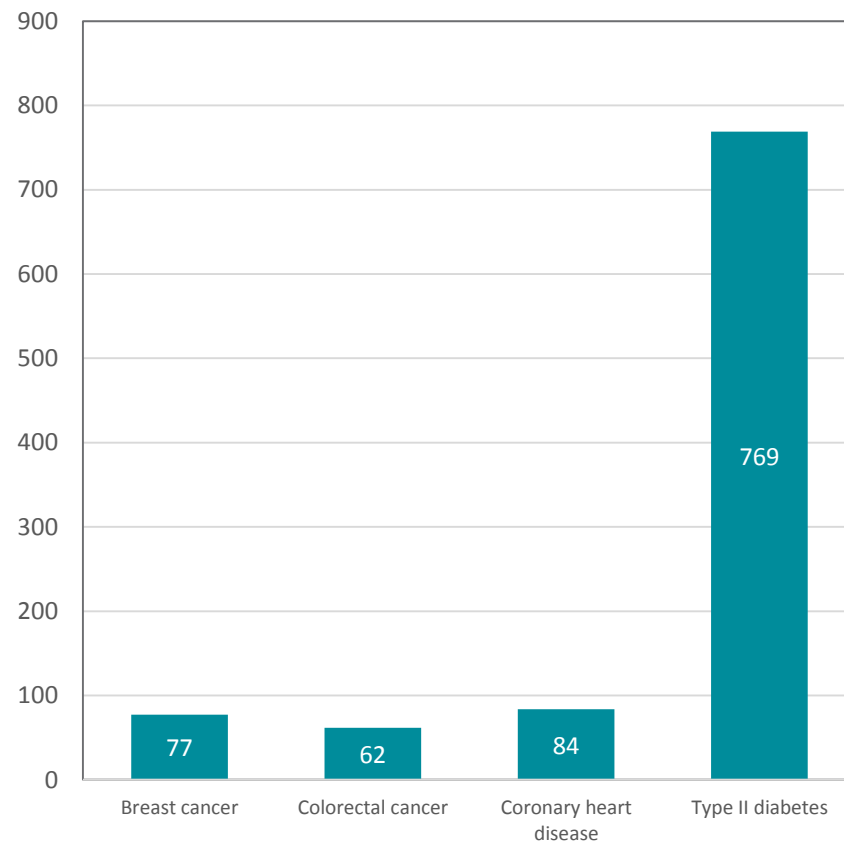
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in type II diabetes cases	15,000	30,000	60,000
Potential direct healthcare cost savings (millions)	€ 38	€ 77	€ 154

## Coronary heart disease

- Around 1% of total healthcare expenditure in Spain is expended upon treatments for CHD, which in 2012 amounted to €1.0 billion. With physical inactivity accountable for around 8.3% of the CHD burden in Spain, the proportion of this expenditure which is attributable to physical inactivity is estimated at €84 million.
- In 2012, almost 126,000 cases of CHD were reported in Spain. If all those who were inactive had met recommended guidelines for physical activity, 10,400 cases could potentially have been averted in that year. Even a 5% decline in physical inactivity prevalence would be enough to avert 500 Spanish CHD cases, as below:

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in CHD cases	500	1,000	2,100
Potential direct healthcare cost savings (millions)	€ 4.2	€ 8.4	€ 16.8

Direct healthcare costs attributable to physical inactivity through physical disorders, Spain, 2012 (million €)



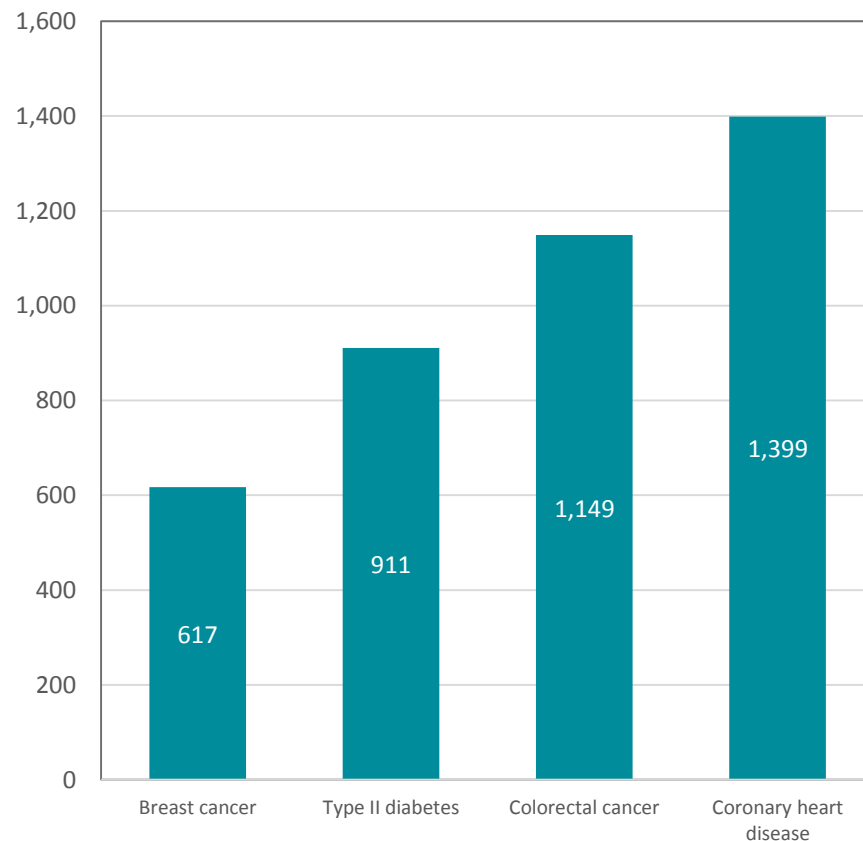
Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

# Indirect costs through inactivity-related physical disorders reach €4.1 billion per year

- In Spain, coronary heart disease (CHD) contributes the largest indirect costs of inactivity, through the major NCDs considered in this analysis. This sum amounted to €1.4 billion 2012, driven by the 62,000 DALYs lost to this NCD as a result of inactivity in that year. This highlights the severity of the condition in terms of the healthy life years which are lost as a result of it. The same is true of colorectal and breast cancer, which together imposed indirect costs of €1.8 billion, despite their relatively low prevalence compared with the other NCDs considered here.
- The indirect costs of inactivity-related type II diabetes, meanwhile, amounted to €911 million in 2012. Despite its much higher prevalence, around 40,000 DALYs were lost to this disorder as a result of physical inactivity during that year – this is consistent with the disorder imposing a lower relative burden (in terms of poor health and premature mortality) than the other considered NCDs.
- The table below sets out the reductions in indirect costs which could have been achieved, if given proportions of inactive Spanish adults had instead established active lifestyles, which met the recommended guidelines for regular physical activity.
- Reducing the level of inactive Spaniards by just one-fifth could avert indirect costs of €815 million annually. Even a much more achievable reductions of 5% could reduce the indirect costs to the Spanish economy to the tune of around €204 million per year.

Percentage decline in physical inactivity	5%	10%	20%
Breast cancer indirect cost savings (millions)	€ 31	€ 62	€ 123
Colorectal cancer indirect cost savings (millions)	€ 57	€ 115	€ 230
Type II diabetes indirect cost savings (millions)	€ 46	€ 91	€ 182
Coronary heart disease indirect cost savings (millions)	€ 70	€ 140	€ 280

Indirect costs attributable to physical inactivity through physical disorders, Spain, 2012 (million €)



Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis



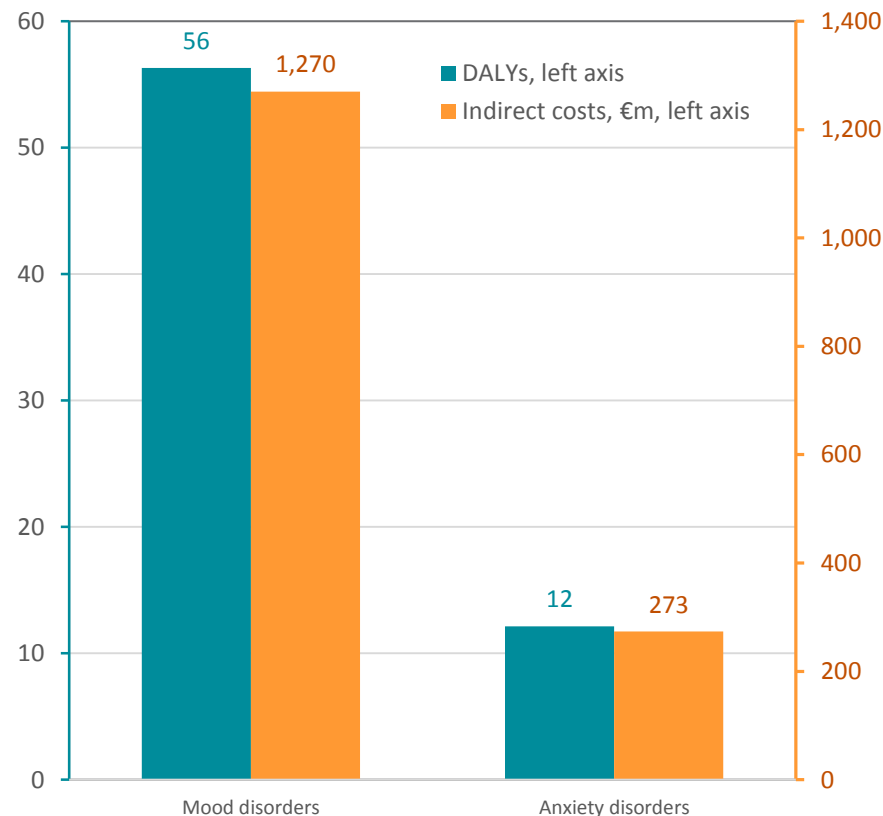
# Inactivity in Spain linked to 68,000 DALYs lost to mental health disorders in 2012

## Mental health and wellbeing

- The total cost of mental illness in Spain reached 1.2 million DALYs in 2012, representing 10% of DALYS lost in that year from all illnesses.
- The cost of unipolar depressive and anxiety disorders amounted to over 670,000 DALYs – these categories include many types of mental disorder which could be ameliorated with increased levels of physical activity. Meng and D’Arcy (2013) estimate that physical inactivity accounted for around 9.0% of the prevalence of mood and anxiety disorders in Canada.
- Applying these fractions to Spain suggests that almost 68,000 DALYs lost to mood and anxiety disorders could be attributable to physical inactivity in 2012.
- Estimating the economic value of these DALYs results in **indirect costs of €1.5 billion**. On this basis, a reduction in the prevalence of inactivity to the tune of 20% could yield cost savings of €309 million.

Percentage decline in physical inactivity	5%	10%	20%
Potential indirect cost savings (millions) from mood and anxiety disorders	€ 77	€ 154	€ 309

Estimated number of DALYs lost due to inactivity-related mood and anxiety disorders in Spain, thousands; and indirect costs, €m, 2012



Source: Meng & D’Arcy (2013), WHO, Eurostat, Cebr analysis

# *Implications of physical inactivity by country*

France

Germany

Italy

Poland

Spain

**United Kingdom**



# The extent and costs of physical inactivity in the UK

- The proportion of British adults who fail to engage in the recommended levels of physical activity is estimated to be **over a third** (37%). For children and adolescents, the proportion is much higher – reaching **85% for 15-year-olds**. A wide disparity is seen between the genders – 32% of adult men fail to meet the recommended levels of activity, compared to 42% of adult women.
- As a result, inactivity is estimated as being responsible for 16.9% of all deaths in the UK – equivalent to around **92,000 people in 2012**. These are lives which could have been saved if these individuals had adopted lifestyles involving the requisite levels of physical activity.
- Through its contribution to four major physical disorders, inactivity in the UK imposes **annual direct healthcare costs of €1.9 billion**. These physical disorders also have an impact on the economy through an additional **€9.4 billion in indirect costs** (referring to the estimated economic value of healthy lives lost to disease and premature mortality).
- Inactive lifestyles are also strongly linked to mental health disorders. We estimate that inactivity-related depressive and anxiety disorders result in the loss of around **91,000 disability-adjusted life years** (DALYs) per year in the UK, consistent with an economic cost of **€2.9 billion**.
- Combining these monetary estimates results in **total annual economic costs of €14.2 billion**, equivalent to 8.3% of UK health spending, half of the UK's entire foreign aid budget or over three times as much as the estimated direct public healthcare expenditure on smoking-related diseases in the UK. This burden to UK society could be averted entirely if all inactive persons adopted simple lifestyle changes to incorporate more exercise in their daily or weekly routines. Even interventions to bring just one-fifth of currently inactive British up to the recommended levels of activity could yield benefits worth **€2.9 billion**.
- These sums nonetheless represent substantial under-estimates of the potential benefits of increasing physical activity. The gains from activity are numerous and interrelated – including alleviating stress levels and supporting wellbeing, enhancing productivity, and reducing the likelihood of future health complications. These positive outcomes are interconnected, yielding compounding individual, economic and social benefits which extend **far beyond the monetary sums** discussed above.

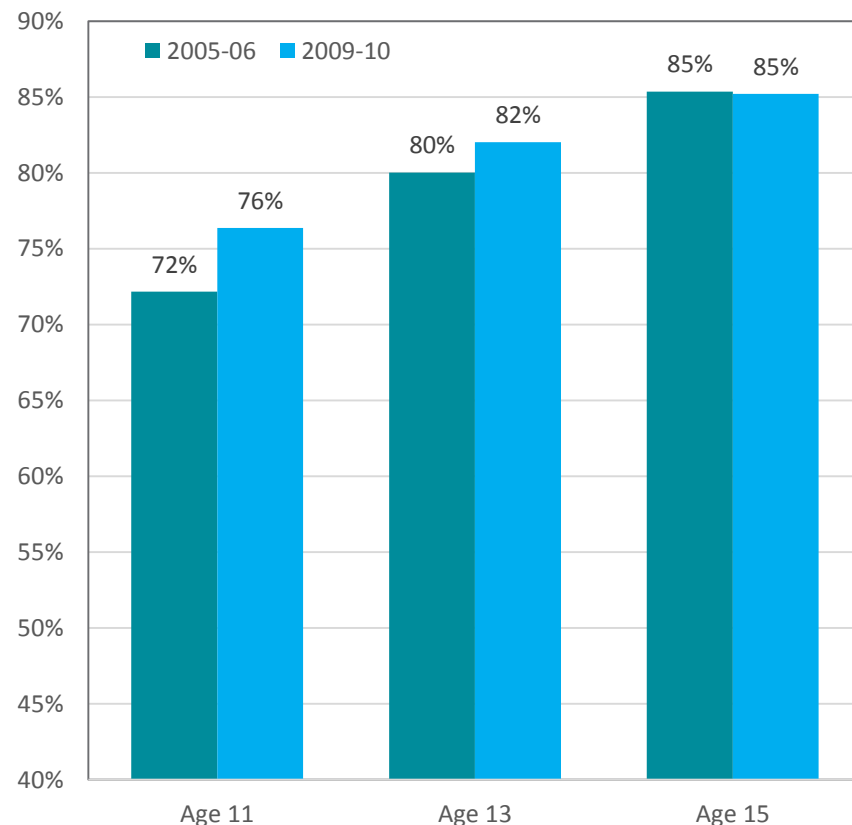
# Over a third of UK adults are insufficiently active

- The WHO estimates that 37.3% of those aged 18 years or older in the UK were insufficiently inactive in 2010. A larger proportion of women than men in the UK do not reach the recommended levels of physical activity – 42.4% of women and 32.3% of men fall within the insufficiently inactive bracket (WHO 2013).
- In the UK, 15-year-old children are less likely to meet the recommended guidelines for daily physical activity than the average 11-year-old: this trend, of inactivity rising with age is observed across all focus nations in this study, as well as many other European/OECD nations.
- While the proportion of 15-year-olds failing to meet recommended levels of activity did not change significantly between 2005-06 and 2009-10, there were substantial rises among younger age groups. The proportion of 11-year-olds who are insufficiently active rose by four percentage points, to 77%, over this timeframe.

## The costs of inactivity in the UK

- Physical inactivity is a key risk factor to a number of diseases i.e. coronary heart disease, type II diabetes, some cancers; as well as all-cause mortality. In the following slides, we consider the extent to which physical inactivity impacts upon the prevalence of these diseases in the UK.
- When considering the prevalence of our analysed diseases which is attributable to inactivity, the UK fares very poorly. For each of the four main disease categories – as well as all-cause mortality – inactivity's contribution is nearly double the average seen across Europe.

Proportion of children that are insufficiently active in UK, 2005-06 and 2009-10



Source: Currie et al., 2008 and 2012, Cebr analysis

# Cutting inactivity in UK by a fifth could avert 18,400 deaths

## Socio-economic aspects of physical activity participation

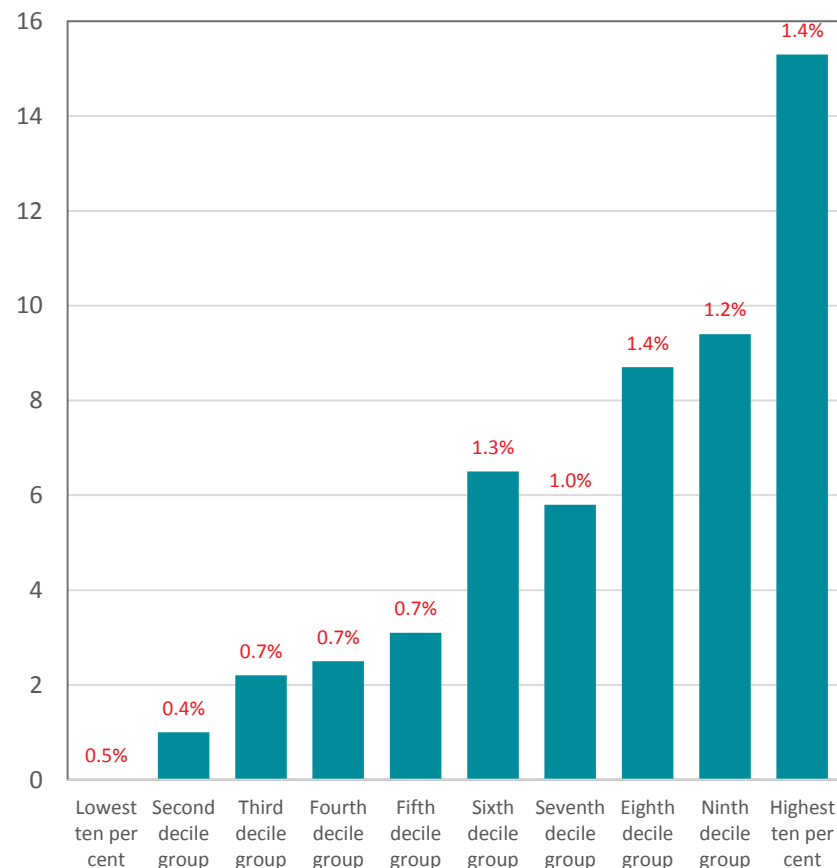
- Data from the ONS' Family Spending Survey reveals that households in lower income groups spent less on sports activities than more affluent groups – both in absolute terms, as well as relative to overall spending. This is consistent with recent evidence suggesting British children from less-affluent families are 28% more likely to not achieve recommended activity levels than their counterparts from highly-affluent families (Borraccino et al., 2010).
- While partaking in physical activity need not cost any money at all, this evidence suggests that lack of financial resources can act as a significant barrier to physical activity for more disadvantaged socio-economic groups. In the case of organised sports activities and clubs in particular, the costs of admissions, subscriptions and equipment can be prohibitive for poorer households. This underlines the importance of promoting forms of physical activity which are inclusive of and accessible to people from all backgrounds.

## All-cause mortality and life expectancy gains

- Physical inactivity has been estimated to be responsible for 16.9% of all deaths in the UK. This implies that if all persons across the UK had been active, 92,200 deaths could potentially have been averted in 2012. This is consistent with an increase in nationwide life expectancy of 1.07 years – the highest gain across the six focus countries in study. For those inactive persons who become active, average life expectancy gains could amount to 2.87 years.
- As physical inactivity is unlikely to be completely eliminated, the table below illustrates the estimated potential deaths that could have averted in 2012 through reducing the prevalence of inactivity by 5%, 10% and 20%.

Percentage decline in physical inactivity	5%	10%	20%
Estimated potential deaths averted	4,600	9,200	18,400

Average weekly household expenditure on sports activities, £ (green bar) and % of total spending (red text), by disposable income decile, 2013



Source: ONS, Cebr analysis

**Note:** 'Sports activities' encompasses sports admissions, subscriptions, leisure class fees and equipment hire.

# Inactivity's contribution to UK disease burden nearly doubles that of the European average

## Breast cancer

- The cost to the UK's health system of breast cancer treatments is estimated at €943 million in 2012. With physical inactivity being accountable for 17.9% of these cases, we estimate the resultant direct healthcare costs at around €169 million in that year.
- In the UK, over 200,000 people were estimated to have breast cancer in 2012. If all individuals in the UK met their recommended levels of physical activity, this figure could be expected to be 35,900 lower. Even comparatively modest reductions in physical inactivity could result in substantial cost savings:

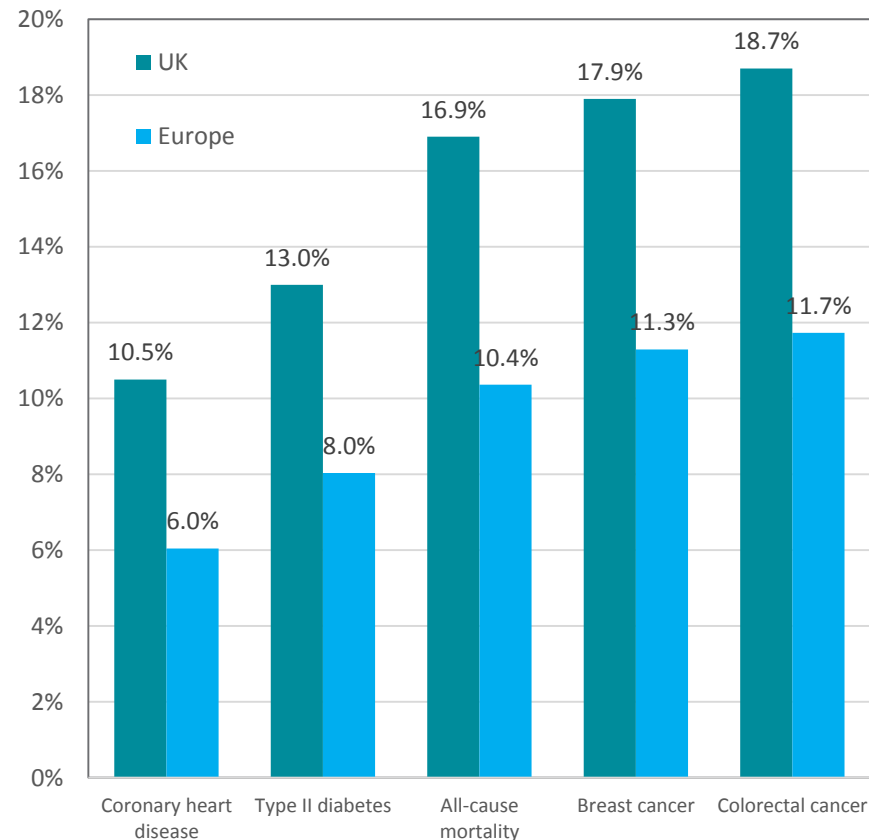
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in breast cancer cases (5y prevalence)	1,800	3,600	7,200
Potential direct healthcare cost savings (millions)	€ 8.4	€ 16.9	€ 33.8

## Colorectal cancer

- An estimated 104,000 people in the UK have colorectal cancer, with total expenditure upon treatments for this form of cancer estimated at €699 million in 2012 – equivalent to 0.4% of total health expenditure in that year.
- The proportion of colorectal cancer cases which arise due to physical inactivity is the highest in the UK across our focus countries. The UK's PAF is estimated at 18.7%, which is 8.9 percentage points greater than the European average. The table below illustrates the potential cases averted and cost savings which could result from modest reductions in physical inactivity:

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in colorectal cancer cases (5y prevalence)	1,000	1,900	3,900
Potential direct healthcare cost savings (millions)	€ 6.5	€ 13.1	€ 26.1

Estimated population attributable fraction (PAFs) of physical inactivity in major diseases in the UK and Europe, 2008



Source: Lee et al., 2012, Cebr analysis



# Annual direct cost of inactivity-related physical disorders reaches €1.9 billion in the UK

## Type II diabetes

- Inactivity is estimated to cause 13% of all type II diabetes cases in the UK – this is equivalent to 390,000 cases in 2012 which could potentially have been prevented, if all persons in the UK met their recommended guidelines for physical activity.
- The cost burden associated with inactivity-related diabetes is estimated at €1.3bn for the UK in 2012. A decline in levels of physical inactivity, of even 5% could have averted around 20,000 diabetes cases, reducing direct costs of the disease by almost €64 million.

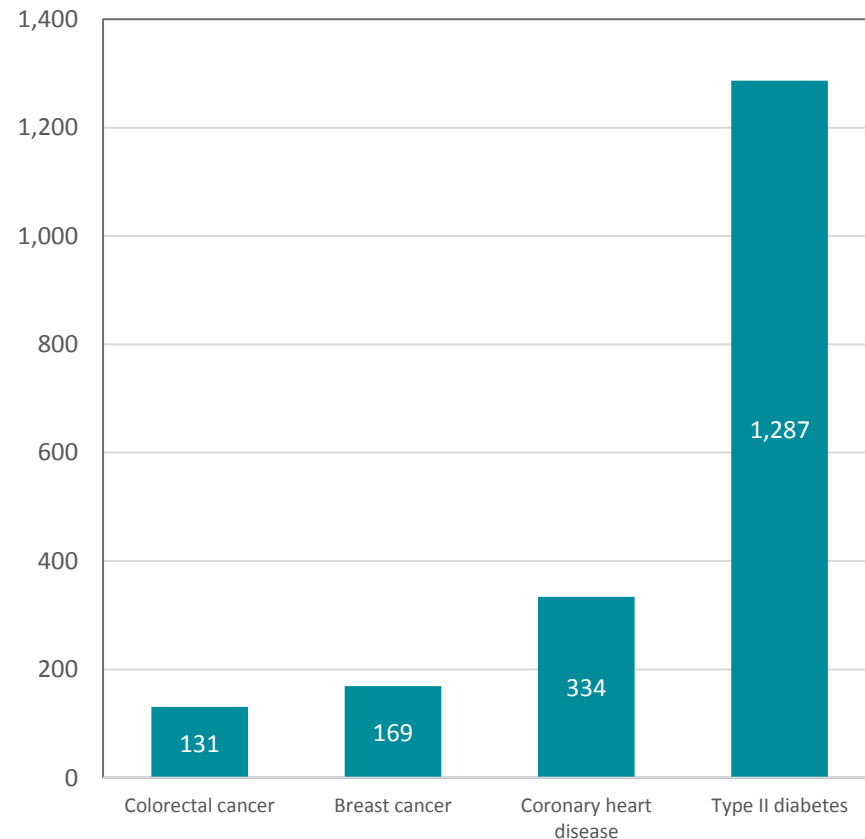
Percentage decline in physical inactivity	5%	10%	20%
Potential decline in type II diabetes cases	20,000	39,000	78,000
Potential direct healthcare cost savings (millions)	€ 64	€ 129	€ 257

## Coronary heart disease

- Physical inactivity is accountable for 10.5% of CHD prevalence in the UK – nearly double the EU average (5.5%). In 2012, the direct healthcare costs of CHD amounted to €3.2 billion, with the proportion of this burden resulting from physical inactivity estimated at €334 million.
- In 2012, there were 246,000 people with CHD in the UK. If everyone in the UK to met the recommended levels of physical activity, around 26,000 CHD cases could have been averted. If physical inactivity levels were just 10% lower, then an estimated 2,600 cases of CHD could have been averted, saving €33.4 million in direct healthcare costs:

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in CHD cases	1,300	2,600	5,200
Potential direct healthcare cost savings (millions)	€ 16.7	€ 33.4	€ 66.8

Direct healthcare costs attributable to physical inactivity through physical disorders, UK, 2012 (million €)



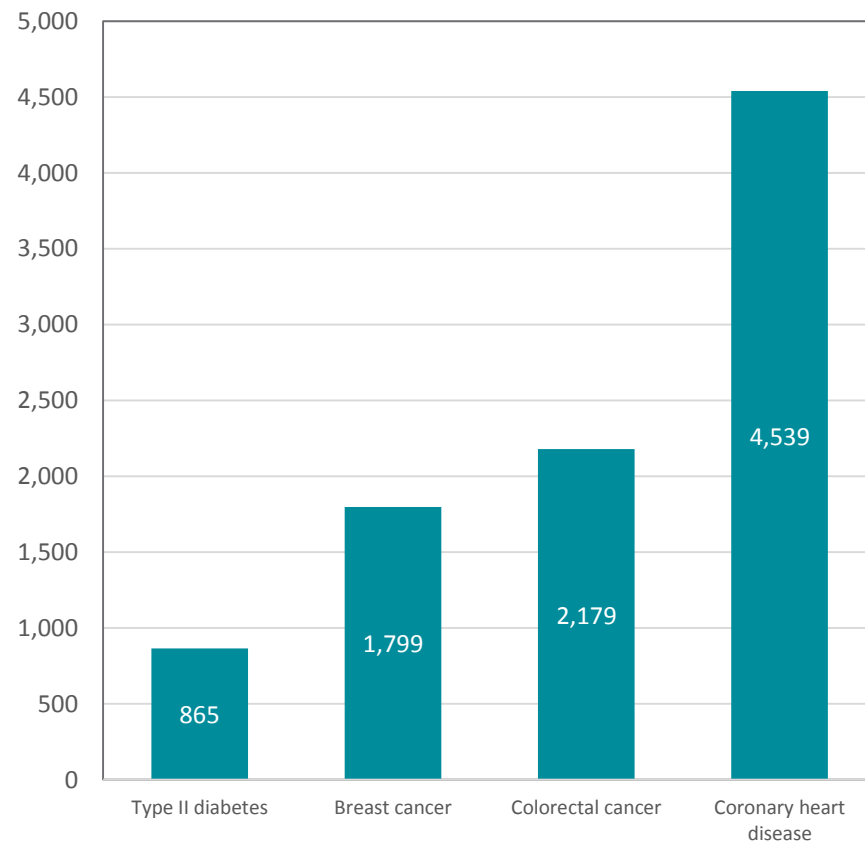
Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

# Indirect costs of inactivity through physical illnesses in the UK reach €9.4 billion per year

- In the UK, coronary heart disease (CHD) contributes the largest indirect cost of the major inactivity-related NCDs considered in this analysis. This cost amounted to €4.5 billion 2012, driven by over 140,000 DALYs lost to this NCD as a result of inactivity in that year. This volume of DALYs lost underlines the severity of the condition, in terms of the healthy life years which are lost as a result of it.
- The same is true of colorectal and breast cancer, which together imposed indirect costs of €4.0 billion, despite their relatively low prevalence compared with the other NCDs considered here.
- The indirect costs of inactivity-related type II diabetes, meanwhile, amounted to €865 billion in 2012. Despite its much higher prevalence, around 27,000 DALYs were lost to this disorder as a result of physical inactivity during that year – this is consistent with the disorder imposing a lower relative burden (in terms of ill-health and premature mortality) than the other considered NCDs.
- The table below sets out the reductions in indirect costs which could have been achieved, if given proportions of inactive British adults had instead established active lifestyles, which met the recommended guidelines for regular physical activity.
- Reducing the level of inactive Brits by just one-fifth could avert indirect costs through these physical disorders to the order of around €1.9 billion annually. Even a much more achievable reductions of 5% could reduce the indirect costs to the UK economy by around €470 million per year.

Percentage decline in physical inactivity	5%	10%	20%
Breast cancer indirect cost savings (millions)	€ 90	€ 180	€ 360
Colorectal cancer indirect cost savings (millions)	€ 109	€ 218	€ 436
Type II diabetes indirect cost savings (millions)	€ 43	€ 86	€ 173
Coronary heart disease indirect cost savings (millions)	€ 227	€ 454	€ 908

Indirect costs attributable to physical inactivity through physical disorders, UK, 2012 (million €)



Source: WHO, Eurostat, Nichols et al., (2012), EUCAN, IDA, Cebr analysis

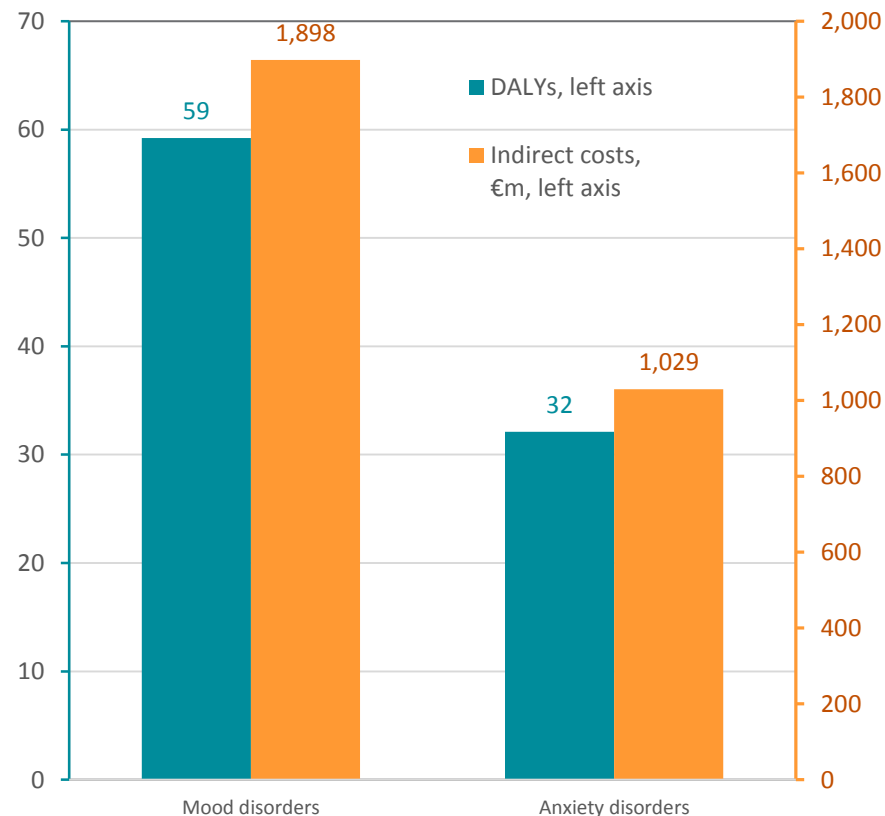
# Around 91,000 DALYs lost in UK to inactivity-linked mood and anxiety disorders

## Mental health and wellbeing

- In 2010-11, over 1.5 million adults utilised NHS services for severe or enduring mental health problems. Mental ill health costs the UK economy €87 billion – equivalent to 4.5% of GDP – through lost productivity, social and healthcare costs (OECD 2014).
- Between 8% and 12% of the British population experience depression in any year (Let's Get Physical 2013). This is not limited to adults: in 2004, almost 80,000 children and young people had serious depression, while 290,000 had an anxiety disorder (Young Minds). Physical activity can be an alternative to pharmaceutical and psychological therapies for treating depression, whether used by itself or in conjunction with these approaches (Let's Get Physical 2013).
- Evidence from Canada suggests that physical inactivity can account for around 9.0% of the prevalence of mood and anxiety disorders (Meng and D'Arcy, 2013). Applying these fractions to the UK results in estimates of around 91,000 DALYs lost to mood and anxiety disorders which are attributable to physical inactivity.
- Estimating the economic value of these DALYs results in **indirect costs of €2.9 billion**. On this basis, a reduction in the prevalence of inactivity to the tune of 20% could yield cost savings of €586 million.

Percentage decline in physical inactivity	5%	10%	20%
Potential indirect cost savings (millions) from mood and anxiety disorders	€ 146	€ 293	€ 586

Estimated number of DALYs lost due to inactivity-related mood and anxiety disorders in UK, and indirect costs, €m, 2012



Source: Meng & D'Arcy (2013), WHO, Eurostat, Cebr analysis

# Appendix



# Definitions

## **Insufficiently active**

Those who do not meet the following WHO physical activity guidelines for persons of their age; for children (aged 5-17) – at least 60 minutes of moderate- to vigorous-intensity physical activity daily; for adults (aged 18+) – at least 150 minutes of moderate-intensity activity per week, or 75 minutes of vigorous-intensity activity per week (or equivalent combination).

There are many methods for the measurement of activity levels, some utilising surveys, and others drawing on objective measurements from (e.g.) pedometers or accelerometers. Activity levels in this report are drawn from WHO's Global Health Observatory (GHO). These aggregate information drawn from many surveys of physical activity across all domains (work, leisure, transport, home life). Adjustments are made by WHO to align survey results to the WHO definition of insufficient physical activity, to control for bias in self-reported surveys, to account for rural/urban coverage, and the age structure of the survey population.

## **Direct (health care) costs**

The total nationwide health care expenditure, both private (i.e. individuals, families, businesses etc.) and public, on treatments for the specific illnesses (e.g. type II diabetes) which can be attributed to inactivity. These include primary care, outpatient care, A&E, inpatient care and pharmaceutical costs. Mental health disorders are not assessed in terms of direct costs, due to lack of detailed data on expenditure associated with mental health disorders of specific types.

## **Indirect costs**

Indirect costs are estimated based on the loss of healthy life which is imposed by the various inactivity-related disorders examined. The source of these data are the WHO Global Burden of Disease dataset. The economic value of these DALYs are estimated using per-capita GDP in each nation.

## **Population attribution fraction (PAFs)**

The contribution of a risk factor to a given outcome (i.e. disease or a death) is quantified using the population attributable fraction (PAF). PAF is the proportional reduction in population disease or mortality that would occur if exposure to a risk factor were reduced to an alternative ideal exposure scenario (e.g. elimination of physical inactivity). It is an estimate of the fraction of a disease burden which is attributable to a given risk factor – in this case, physical inactivity.

## **Disability adjusted life years (DALYs)**

The number of years lost to ill-health, disability or early death. One DALY can be thought of as one lost year of “healthy” life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability.

## **Exercise, sport & physical activity**

‘Exercise’ typically refers to structured and repetitive physical activity. ‘Sport’ tends to refer to physical activity that is conducted in the form of organised activities. ‘Physical activity’ is a more general term referring to any moderate or vigorous physical movement (also encompassing sport and exercise).



# Methodology

## Number of disorder cases/deaths attributable to physical inactivity

In estimating the number of cases/deaths of physical inactivity amongst the European population and the six study countries, we employ population attributable fractions (PAFs). These estimate the proportion of cases that would not occur if a particular risk factor was absent (in this study, physical inactivity). The fractions provide useful quantitative estimates of the potential effect of interventions to reduce (or eradicate) the relevant risk factor. Cebr have drawn upon existing PAFs calculated by Lee et al., (2012) to estimate the number of cases of each physical disorder that have arisen through physical inactivity across each country and region in study.

PAFs can also be used to quantify the impact of risk factors on the prevalence of mental disorders, at a population level. However, with little existing literature estimating the PAFs of physical inactivity on the prevalence of mental health disorders, Cebr have drawn upon a Canadian-focused study by Meng and D'Arcy (2013). This paper is the first to quantitatively estimate the degree of mental health disorder cases that are attributable to physical inactivity on a national population basis. Thus, in estimating the contribution of inactivity to mental health disorders across Europe, PAFs from this Canadian study were applied.

## Direct costs

The first step in estimating the direct costs to each region/country was to first identify the total cost burden to the health care system from each specific illness. Health expenditure was defined as the total spending by both private (i.e., households, businesses, charities) and public (i.e., government) bodies.

Having identified these costs we follow the method utilized by Scarborough et al., (2011) which adopts PAFs to identify the proportion of these costs attributable to inactivity. This calculation rests upon the implicit assumption that the average costs for treating inactivity-related disease cases are equal to the average costs for all cases of the disease.

## Indirect costs

Indirect costs assess the economic costs arising from pain and suffering and lives lost due to disorders. These are measured in DALY terms, and their economic value is estimated using GDP per capita in each nation. This is a relatively conservative approach to estimating indirect costs compared to other methods such as stated or revealed preference approaches to estimating the 'value of a statistical life' (VSL). Such VSL approaches attempt to calculate the value of life through analysing the compensation people require to voluntarily be exposed to increased risk of death or injury; or investigating how much people are willing to pay for a reduced likelihood of dying. Our approach, which measures only economic output typically associated with a year of healthy life, is adopted in recognition of the fact that the intrinsic value of life and health cannot be adequately reflected in monetary estimates.

## Life-expectancy gains

Life expectancy gains are estimated through the Lee et al., paper (2012). The authors calculated the average (nation-wide) increase in life expectancy which could be expected through the eradication of inactivity. We calculate the additional gross number of life-years implied by this increase; distributing them equally across the currently-inactive population.



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# About Cebr and ISCA



## ***About Centre for Economic and Business Research (Cebr)***

Cebr is the Centre for Economics and Business Research, one of the UK's leading economics consultancies. Cebr was founded in 1993 by Professor Douglas McWilliams, the former Chief Economic Adviser of the CBI and Chief Economist at IBM UK. Cebr delivers macroeconomic analysis and forecasts to a wide array of retained private and public sector clients, and provides bespoke economic impact analysis of different policies, at whole economy, sector and individual company levels. In our twenty year history we have worked with hundreds of private and public sector organisations, helping to influence company strategy, government policy and the public debate.

## ***About International Sport and Culture Association (ISCA)***

*ISCA is a global platform open to organisations working within the field of sport for all, recreational sports and physical activity. Founded in 1995, ISCA is today a global actor closely cooperating with its 180 member organisations worldwide (including 91 European organisations), international NGOs, and public and private sector stakeholders.*

*ISCA is dedicated to increasing the uptake of physical activity – that is because we believe that all citizens have the right to enjoy the physical, mental and social benefits of a physically active lifestyle. However, physical activity promotion relies on a multi-sector approach and on effective initiatives that can assist communities and individual citizens in engaging in a more active lifestyle.*

*In 2012, ISCA launched the NowWeMOVE campaign with the aim of bringing the sport for all sector and a variety of other sectors together to tackle the physical inactivity epidemic across Europe. NowWeMOVE is now Europe's biggest campaign promoting sport and physical activity. Its vision is to get "100 million more Europeans active in sport and physical activity by 2020". The campaign's overall objectives are to raise awareness of the benefits of sport and physical activity among European citizens; promote opportunities to be active in sport and physical activity; and enable sustainable and innovative capacity building for providers of physical activity initiatives through open-source solutions and advocacy.*

*'The Economic Cost of Physical Activity in Europe' research report is a natural step in ISCA's work towards informing people about the value of physical activity and equipping stakeholders in physical activity promotion with resources they can use to push the agenda forward. That is why in February 2015, ISCA commissioned the Centre for Economic and Business Research (Cebr) to examine the physical and mental health costs of inactivity for Europe (based on France, Germany, Italy, Poland, Spain, and the UK).*

*We strongly believe it is time to respond to and act on our knowledge of physical inactivity as a pressing social issue in Europe. It is high time to defuse the inactivity time bomb."*



# Contribution to ISCA's NowWeMOVE work

- Moving more is one of the most important things you can do for your health, but it also makes people happier. That is why Coca-Cola is supporting day-to-day physical activity through more than 90 active lifestyle programmes in local communities across every European country we operate in, involving 3.5 million people. This is a long-term commitment. Coca-Cola wants to continue to get people more active, more often and is investing in local community programmes to achieve this goal. Its European ambition is to involve 10 million people in physical activity programmes by 2020.
- To get Europeans to become sufficiently active requires a transformation that can only be achieved through innovative partnerships and cross-sector collaboration. This requires government, civil society and business to work together. Coca-Cola is actively seeking these partnerships throughout all of the programmes it supports.
- Its collaboration with ISCA in this research project fits in this approach and builds on its joint ambition to get more people active, which it shares as a member of the European Platform for Action on Diet, Physical Activity and Health.
- Among other initiatives, Coca-Cola is supporting ISCA's MOVE Activation programme (via The Coca-Cola Foundation) under the umbrella of the NowWeMOVE campaign. With this contribution ISCA will be able to develop and enhance initiatives for hard-to-reach populations and thereby bring physical activity into the lives of some of the least active groups in society.





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