Office for National Statistics

Statistical bulletin

Health benefits from recreation, natural capital, UK: 2022

Further development of the UK recreation natural capital ecosystem service accounts, including specific methods used to estimate the health benefits gained from nature-based recreational activities.

Contact:
Harry Davies and Nirav Nayee
natural.capital.team@ons.gov.uk
+44 1633 580051

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1 . Main points

- The value of health benefits associated with outdoor recreation within the UK was estimated to be between £6.2 billion and £8.4 billion in 2020.
- Between 2009 and 2020, recreational visits in built-up areas and gardens accounted for over 50% of the total health benefits associated with recreation.
- The percentage of those aged 16 to 24 years and those aged 65 and over who gained health benefits associated with recreation was slightly lower than other ages between 2009 and 2020.
- Scotland consistently had the highest value associated with recreational health benefits per person of the four UK nations, while Wales consistently had the lowest value.

2 . Understanding goods and services from ecosystems

Ecosystems provide three main types of goods and services.

Provisioning

These services provide things like food and water from nature.

Regulating

These services result from the capacity of ecosystems to regulate the climate, such as the removal of air pollution or greenhouse gas emissions.

Cultural

Cultural services are intellectual and symbolic benefits people get from ecosystems through recreation, knowledge development, relaxation and reflection.

For these cultural services, we are usually only able to quantify more direct and transactional aspects such as recreation and peoples' engagement with the outdoors. The natural environment provides a space for recreational activities, which in turn, creates additional satisfaction, pleasure and enjoyment.

The Office for National Statistics (ONS) has so far estimated the value of recreation through the combination of two methodologies.

The "travel cost" approach estimates the amount spent on items that enable visits to the natural environment, such as transport, car parking and admission costs. In the absence of a ticket to access a public beach, buying a bus ticket represents the cost of the trip.

The second approach estimates the additional value of house prices because of their proximity to green spaces such as parks and blue spaces such as lakes. The valuation reflects the additional price the occupant has paid to have better access to green and blue spaces.

There are other benefits of spending time in nature than those we have captured so far though. Scientific literature shows that trips in natural environments have a positive effect on health and well-being as outlined in Public Health England's Improve access to greenspace review (PDF, 229KB). Nature provides open spaces for exercise and regular exercise in outdoor natural environments can improve physical health. Studies have also shown that spending time outdoors can reduce stress and anxiety, improving mental well-being.

We have therefore explored estimating the value of health benefits from outdoor recreation through two different approaches. Both approaches are based on statistical work which looks for “positive correlations”; links between an increase in activity and an improvement in self-reported health.

The literature examining health and exposure to nature is still growing and currently supports the theory of a causal link. This suggests that time outside leads to better health, rather than the relationship being coincidental or even that those with better health are more likely to spend time outdoors. Evaluating causal links between nature and health requires detailed information about individuals and therefore, is difficult to infer at a national scale. To mitigate this, we can aim to continually develop research on both smaller and larger scales to provide our best estimates of what is happening.

We remain cautious in inferring causation and present parallel methods with the intention of measuring the same value – a causal link. Despite acknowledging an academic need for caution, for the rest of this bulletin we discuss “health benefits gained”, using clear language to describe the purpose of this experimental statistical work.

3 . Estimating health benefits: outdoor exercise approach

The methodology used to estimate the health benefits gained from outdoor exercise has been adapted from a report by Economics for the Environment Consultancy (EFTEC). Their method estimates the physical health benefits gained from outdoor recreation in an urban environment by building on the work of White and others (2016). However, we have expanded the methodology to encompass a wider range of natural habitats.

We used recreational surveys to estimate the number of "active visitors". These were people responding to surveys who did 30 minutes of moderate to intense physical activity, five times a week. The health benefits they gained from outdoor recreation depends on the number of those five sessions that took place in nature.

Data from the Health Survey for England were used to estimate the value of benefits gained from regular physical activity, if undertaken 52 weeks a year. While this evaluation focused on the physical health benefits from exercise, it is also likely to capture some of the mental well-being benefits.

The results discussed in this section feature estimates of both the number of active visitors and the monetary value of the health benefits they gained from outdoor exercise within the UK. We apply the model, based on English data, to activity data from Scotland and Wales to extrapolate benefits in Great Britain. To estimate values for the UK we extrapolate from Great Britain on a per person basis for Northern Ireland. A detailed explanation of the methodology used to generate these figures can be found within our methodology report.

The number of active visitors should be read as the "number of 'active visitors' per year equivalent". This is because the same individuals are not surveyed every week throughout the year. As a result, we aggregate the weekly samples to arrive at a total figure.

Figure 1 shows the total number of people (equivalent), that gained health benefits from outdoor exercise within the UK was estimated to be 11.5 million in 2020. This was equivalent to 21% of the UK population. The number of people gaining health benefits has increased 58% from 7.3 million in 2009, the start of the time series, which was only 14.4% of the population.

The split of "habitats" used in the Monitor of Engagement with the Natural Environment (MENE) is almost equivalent to the eight broad habitats used in Natural Capital Accounts though naming conventions are different. "Built-up areas and gardens" is broadly equivalent to the "Urban" habitat. Usually, we would map across to the standard natural capital habitat names. In this bulletin we have kept the naming conventions of the underlying dataset to maintain transparency for users looking to repeat this analysis.

The increase in the number of people who gained health benefits between 2009 and 2018 was driven by an increase in outdoor exercise within built-up areas and gardens. At its peak, in 2018, the benefits gained from built-up areas and gardens as a proportion of the total reached 61%.

The effect of the coronavirus (COVID-19) pandemic and subsequent national government responses changed the way people interacted with nature throughout 2020. In April 2021 we published an article on How has lockdown changed our relationship with nature? People within built-up areas and gardens areas may have visited more diverse areas of nature, as opposed to a green space within their local urban area.

Between 2018 and 2020, the survey used to create recreational estimates for England was replaced. Changes to questionnaire wording may have also affected the types of habitats respondents said they visited.

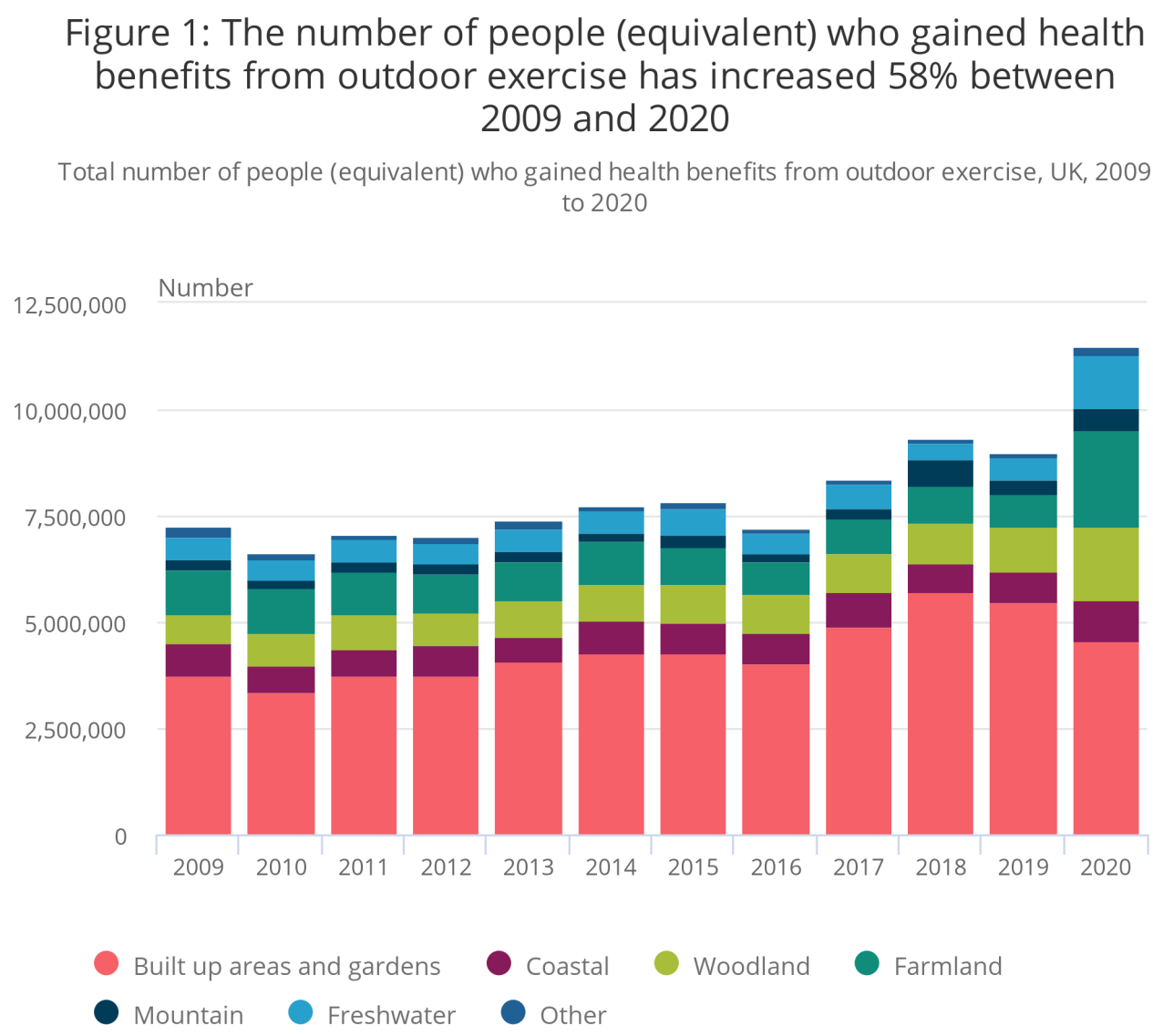
Between 2019 and 2020, built-up areas and gardens saw a large decline in value, though remained the most popular habitat to visit. In 2020, 4.5 million people (equivalent) gained health benefits from outdoor exercise in built-up areas and gardens, down 20% from 5.5 million the previous year. In 2020 40% of the total number of health benefits gained were from built-up areas and gardens.

Despite a decline in value within built-up areas and gardens, the total number of people (equivalent) who gained health benefits from outdoor exercise within the UK increased from 9.0 million in 2019 to 11.5 million in 2020. During the same period, the number of people benefiting in woodland increased by 69%, farmland by 87% and freshwater by 122%.

The number of people (equivalent) who gained health benefits from outdoor exercise within a mountain, moorland and heath habitat was among the lowest of the habitats covered. At its peak in 2018, 0.6 million people (equivalent) gained benefits from this habitat. This could be because of limited access to mountain environments, compared with the other habitats listed, for most of the UK population.

Figure 1: The number of people (equivalent) who gained health benefits from outdoor exercise has increased 58% between 2009 and 2020

Total number of people (equivalent) who gained health benefits from outdoor exercise, UK, 2009 to 2020



Source: Monitor of Engagement with the Natural Environment for England, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

We can convert health benefits into an estimate of the avoided healthcare costs to provide a monetary value. In 2020, the annual value of benefits gained from outdoor exercise in the UK was estimated to be £8.4 billion. The trend of the values in Figure 2 shows a similar trend to those in Figure 1. This is because the monetary value of the benefits gained increases as a larger number of people exercise outdoors.

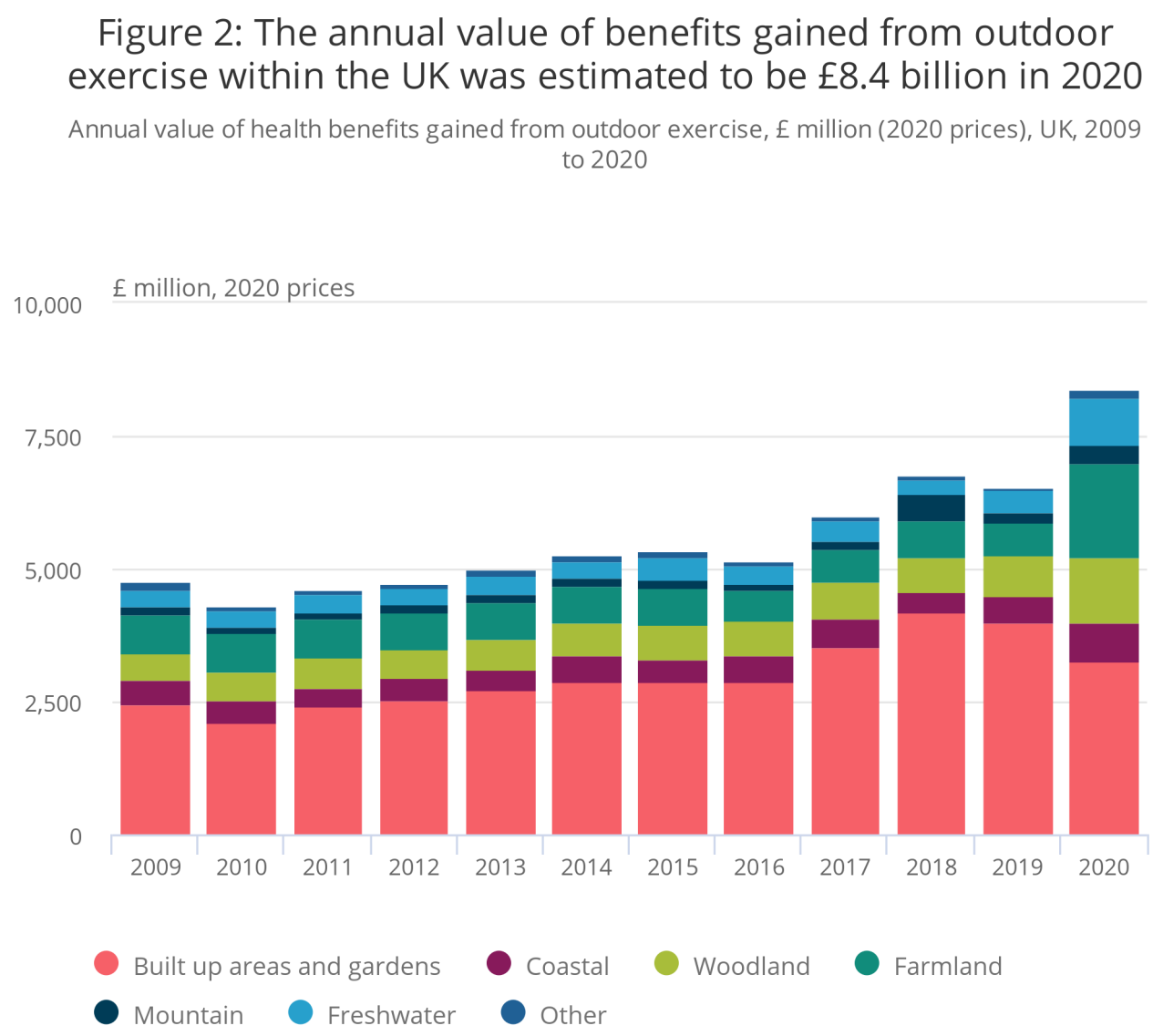
Between 2009 and 2020, estimates of annual value increased by 75%. This was more than the 58% increase in the number of people (equivalent). This was driven by a larger number of exercise sessions taking place in nature, increasing the average monetary value of health benefits gained per person.

For most of the period, the monetary value of the improved health per person receiving benefits was the largest for farmland areas. Between 2009 and 2020, individuals exercising in farmland gained an average benefit of £750 each annually. In comparison, individuals who exercised in coastal areas had the lowest average benefit of £650.

Therefore, in farmland habitats, of those who gain benefits, a larger number of their five exercise sessions are likely to take place outdoors. This might suggest that those who exercise regularly and have access to farmland areas, are more likely to exercise outdoors.

Figure 2: The annual value of benefits gained from outdoor exercise within the UK was estimated to be £8.4 billion in 2020

Annual value of health benefits gained from outdoor exercise, £ million (2020 prices), UK, 2009 to 2020



Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

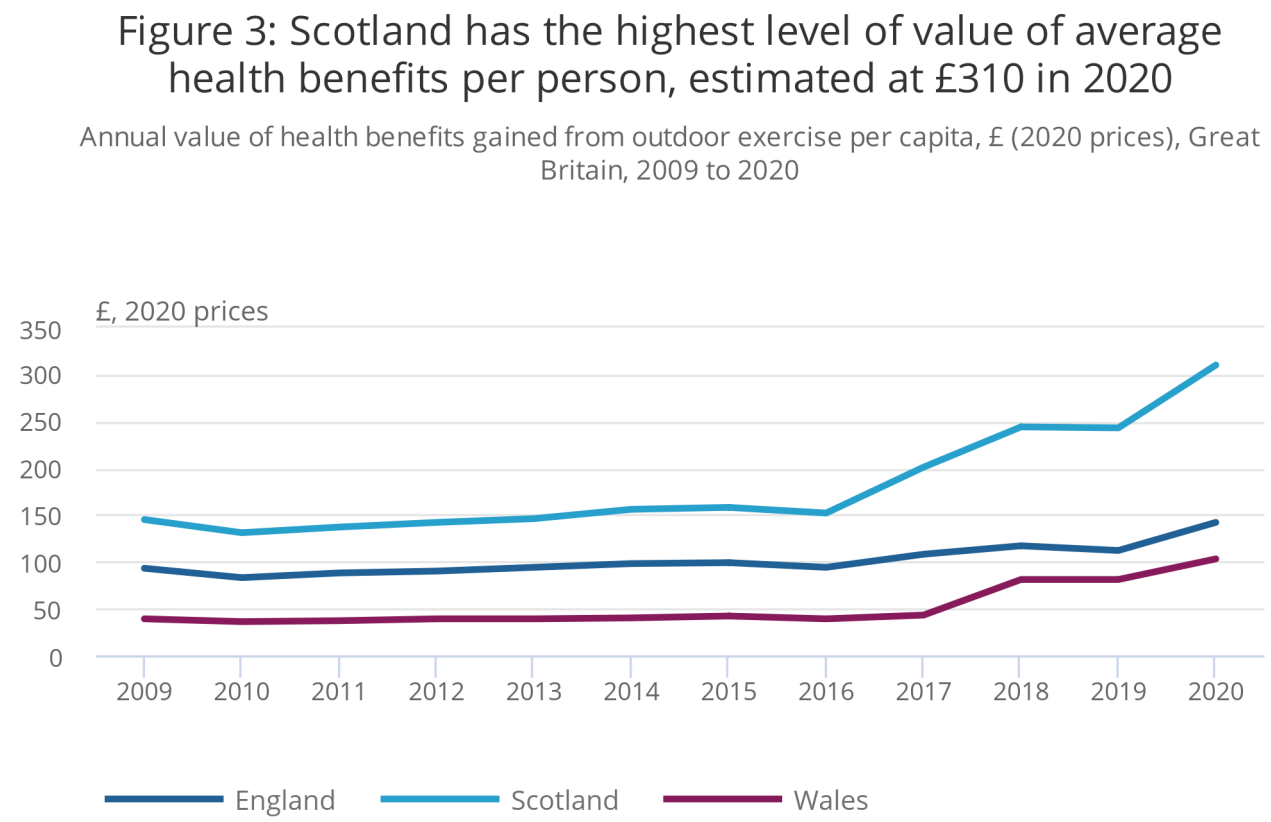
Figure 3 shows the annual value of average benefits gained from outdoor exercise, per person within each nation in Great Britain. Scotland consistently had the highest value of health benefits per person, across the period, estimated at £310 in 2020.

If we focus only on those who gained benefits from outdoor exercise rather than the entire population, the national comparisons differ slightly. In 2020 the estimated value of the benefits gained per person who exercised was £760 in Wales, £720 in England, and £790 in Scotland.

While a smaller proportion of the Welsh population gain health benefits from outdoor exercise compared with the English population those who do gain benefits in Wales are more likely to complete all five of their exercise sessions outdoors than those in England.

Figure 3: Scotland has the highest level of value of average health benefits per person, estimated at £310 in 2020

Annual value of health benefits gained from outdoor exercise per capita, £ (2020 prices), Great Britain, 2009 to 2020



Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

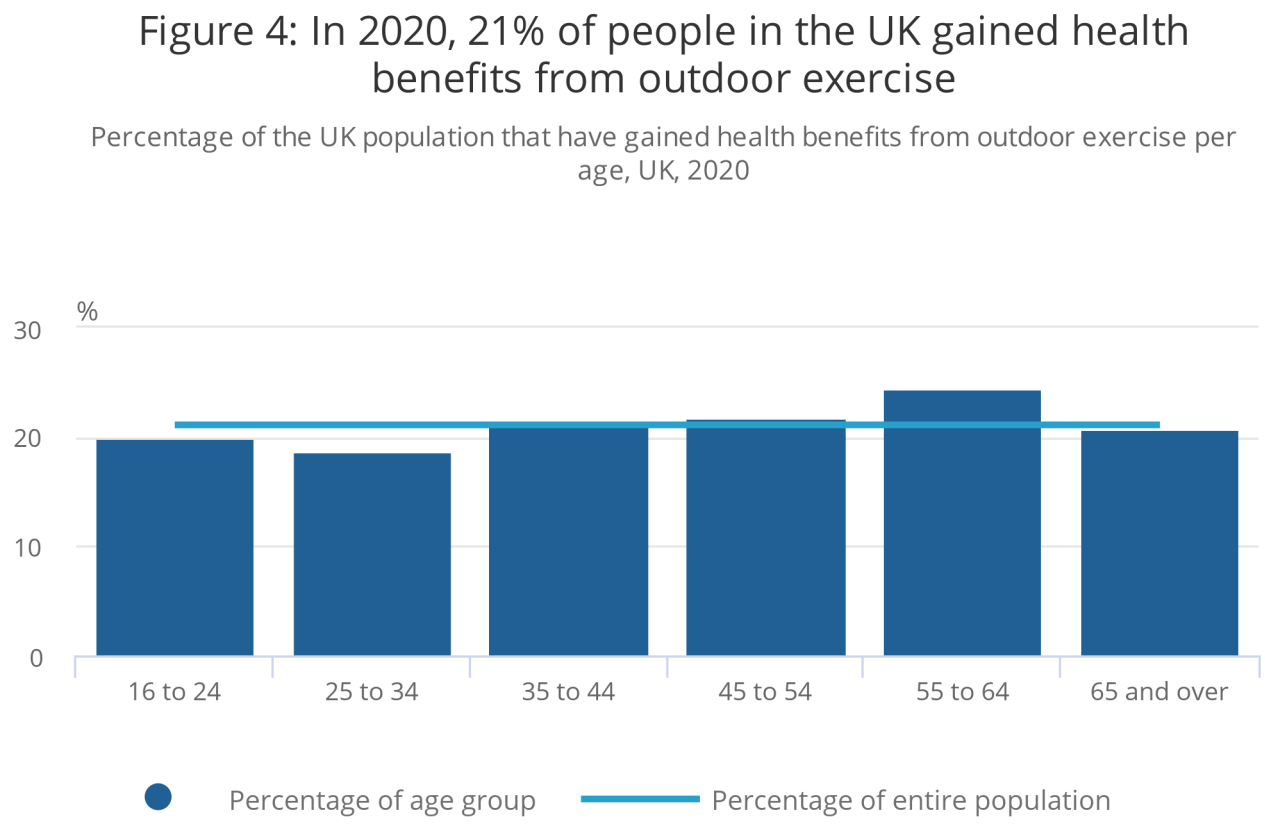
Figure 4 shows the proportion of the UK population that gained health benefits from outdoor exercise in 2020, estimated to be 21% overall. The age group with the lowest proportion, at 18%, was those aged 25 to 34 years and the highest, at 24%, was those aged 55 to 64 years.

Among those people who did outdoor exercise in 2020, those aged 65 years and over gained the largest benefit, £770 per person, while those aged from 25 to 34 years saw the lowest benefit at £670.

Although a smaller proportion of the UK population aged 65 years and over exercise outdoors, those who did were more likely to complete all five of their exercise sessions outdoors. Across the period 2009 to 2020 the likelihood of spending all exercise sessions outdoors tended to increase with age.

Figure 4: In 2020, 21% of people in the UK gained health benefits from outdoor exercise

Percentage of the UK population that have gained health benefits from outdoor exercise per age, UK, 2020



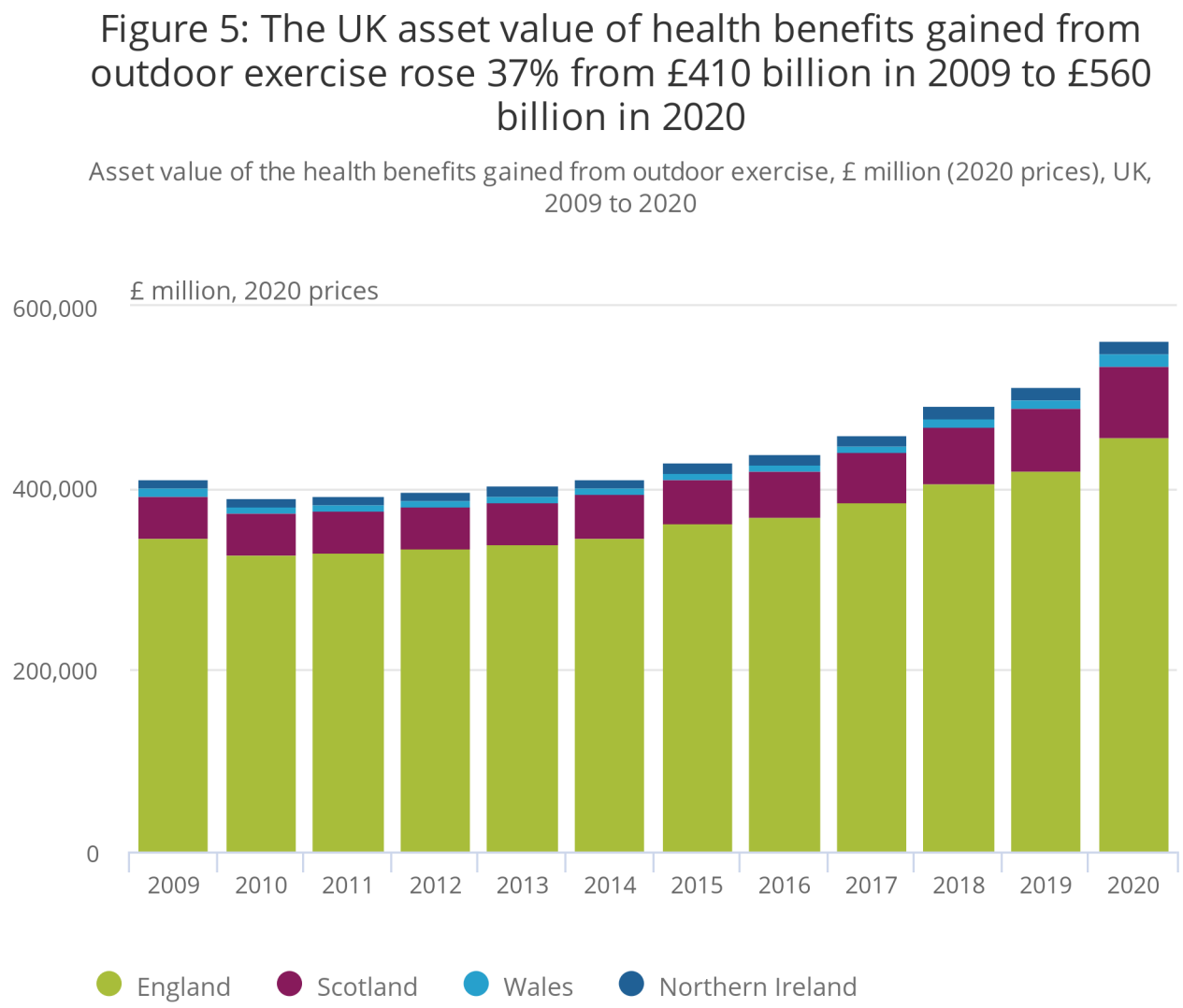
Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

Figure 5 shows estimated UK asset values of the health benefits gained through outdoor exercise. Over the period 2009 to 2020 this increased 37%, from £410 billion to £560 billion in 2020.

In 2020, the estimated asset value of the health benefits gained through outdoor exercise per person in the UK was £10,400. Across the four countries, Scotland had highest asset value, £17,400 per person, in 2020 compared with £10,000 for England, £9,200 for Northern Ireland and £5,200 for Wales.

Figure 5: The UK asset value of health benefits gained from outdoor exercise rose 37% from £410 billion in 2009 to £560 billion in 2020

Asset value of the health benefits gained from outdoor exercise, £ million (2020 prices), UK, 2009 to 2020



Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

4 . Estimating health benefits: exposure to nature

The exercise approach was reliant on questions covering both physical activity outdoors and overall physical activity. The Monitor of Engagement with the Natural Environment (MENE) stopped asking respondents if they had exercised for 30 minutes or more five or more times a week in 2016 to 2018. The Office for National Statistics (ONS) therefore built a second methodology reliant on a smaller number of responses. In addition, we wanted to capture a broader set of health benefits from time spent outdoors, beyond physical activity.

Our methodology to generate health benefits gained from exposure to nature builds on the work of MP White, I Alcock, J Grellier and others on why Spending at least 120minutes a week in nature is associated with good health and wellbeing. This found that individuals who spent at least 120minutes a week in nature had consistently higher levels of both health and well-being than those who reported no exposure. It did not matter how this time was spent, whether over several short visits or a single long session.

This and many other scientific reports (discussed in the methodology report) have expressed the same links. Indirect or direct exposure to nature, having a view of nature and spending time outside in natural settings, are linked to improvements in physical, mental and social well-being. Furthermore, Maund and others (2019) reported that nature-based interventions were also effective in reducing anxiety and improving depressive moods.

We estimated the health benefits gained from exposure to nature by analysing 10 years of data from the MENE survey. Statistical analysis was used to estimate the impact that spending 120 minutes or more in nature had on respondents' self-reported general health. A range of other factors that could affect health were accounted for, details of which are in the methodology report.

The survey had 20,000 participants. Within these, the 6,000 respondents that spent 120 minutes or more in nature reported higher self-reported general health relative to similar respondents who did not. The average value of these benefits was then applied to all recreational survey respondents that met the criteria of spending 120 or more minutes in nature, each week. Improvements to respondents' general health are likely to partially include both mental health benefits, and physical health benefits gained through exercise.

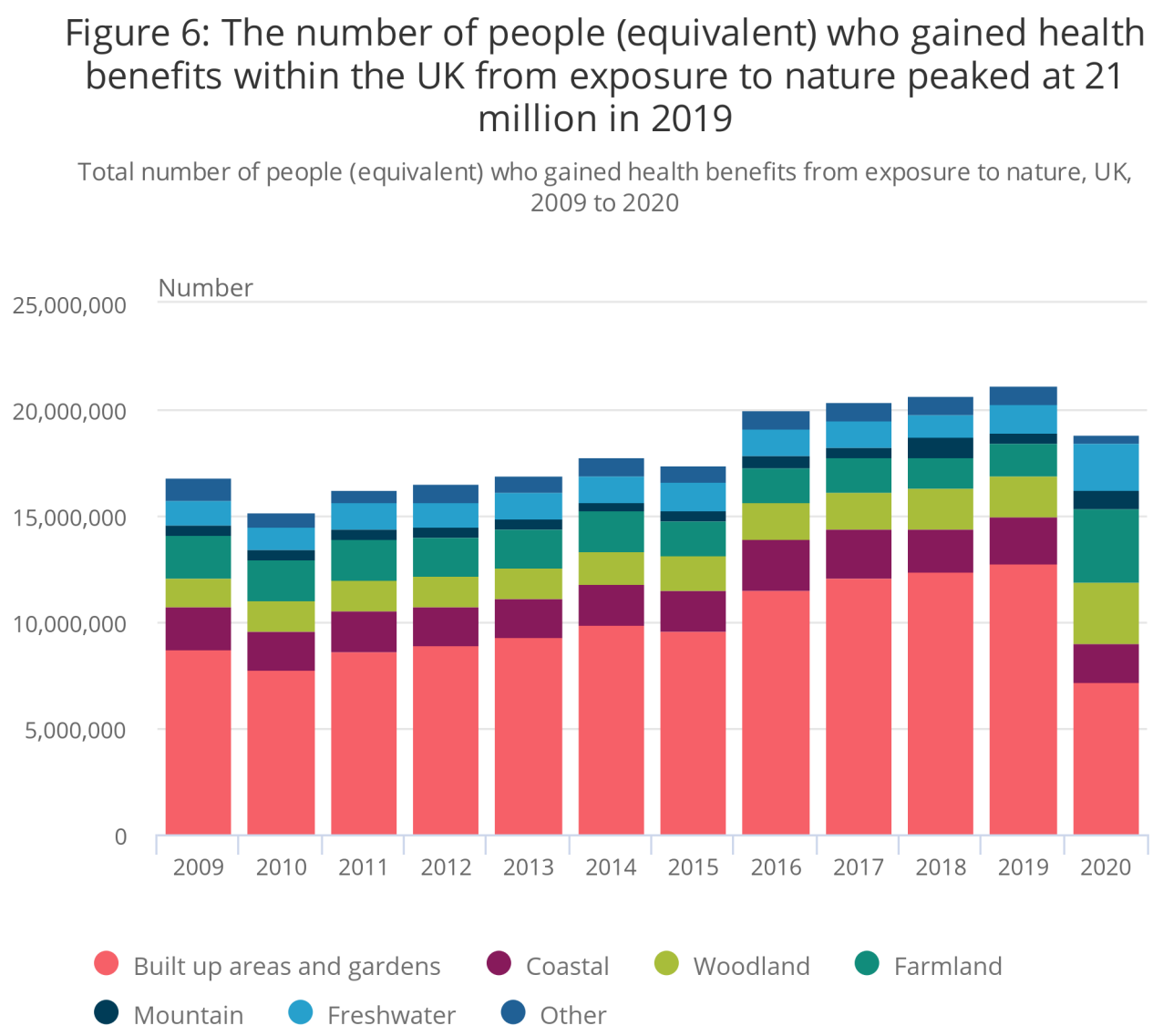
The results discussed in this section feature estimates of the number of visitors (equivalent) to the outdoors that spent 120 minutes or more in nature, 52 weeks a year. As well as estimates of the monetary value of the health benefits gained from exposure to nature within the UK. Figure 6 shows the number of people (equivalent) that gained health benefits from exposure to nature within the UK. This figure fell to 19 million in 2020, having peaked at 21 million in 2019. The fall was driven by a decline in the average duration of trips taken within nature.

Between 2009 and 2019, over 50% of those who gained benefits did so in built-up areas and gardens. This figure increased over the period, peaking at 61% in 2019, before falling to 38% in 2020. Between these two years, the number of people (equivalent) who gained health benefits in woodland increased by 49%, farmland by 135% and freshwater by 75%.

The natural environment of mountains continuously provided the lowest number of people with health benefits from exposure to nature, matching the picture for the outdoor exercise method from 2009 to 2019. This value fluctuated around 0.5 million (annual equivalent) during this period, compared with around 1.2 million for freshwater habitats.

Figure 6: The number of people (equivalent) who gained health benefits within the UK from exposure to nature peaked at 21 million in 2019

Total number of people (equivalent) who gained health benefits from exposure to nature, UK, 2009 to 2020



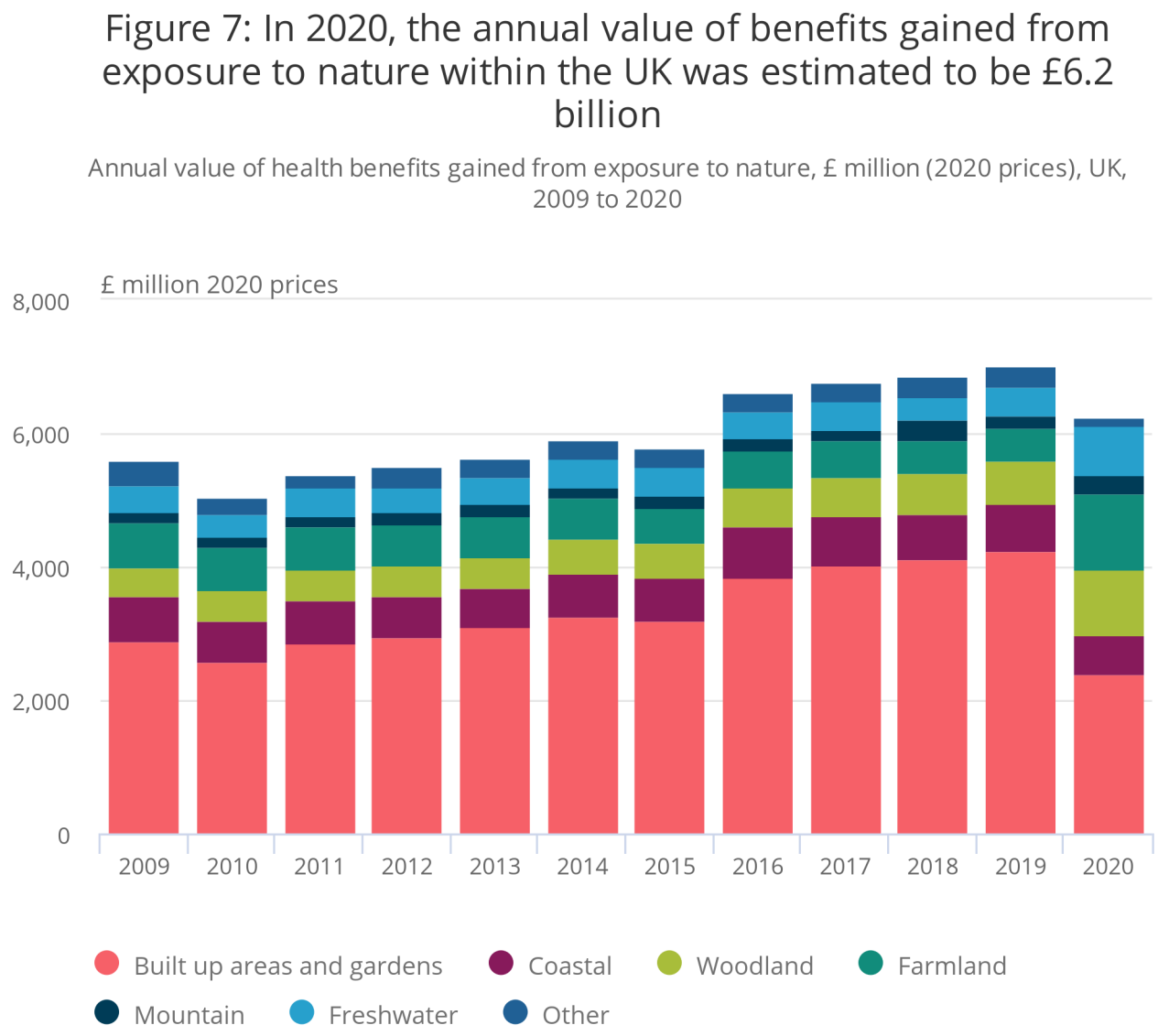
Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

We have produced estimates of the annual monetary value of health benefits gained from exposure to nature in the UK alongside the total number of people (equivalent) who gained those benefits. This was estimated at £6.2 billion in 2020.

Between 2009 and 2019, the annual monetary value increased by 25%, peaking in 2019 at £7 billion. Most of this growth was driven by increases in the benefits gained within built-up areas and gardens. During the same period, the annual value in built-up areas and gardens grew by £1.3 billion, 31%.

Figure 7: In 2020, the annual value of benefits gained from exposure to nature within the UK was estimated to be £6.2 billion

Annual value of health benefits gained from exposure to nature, £ million (2020 prices), UK, 2009 to 2020



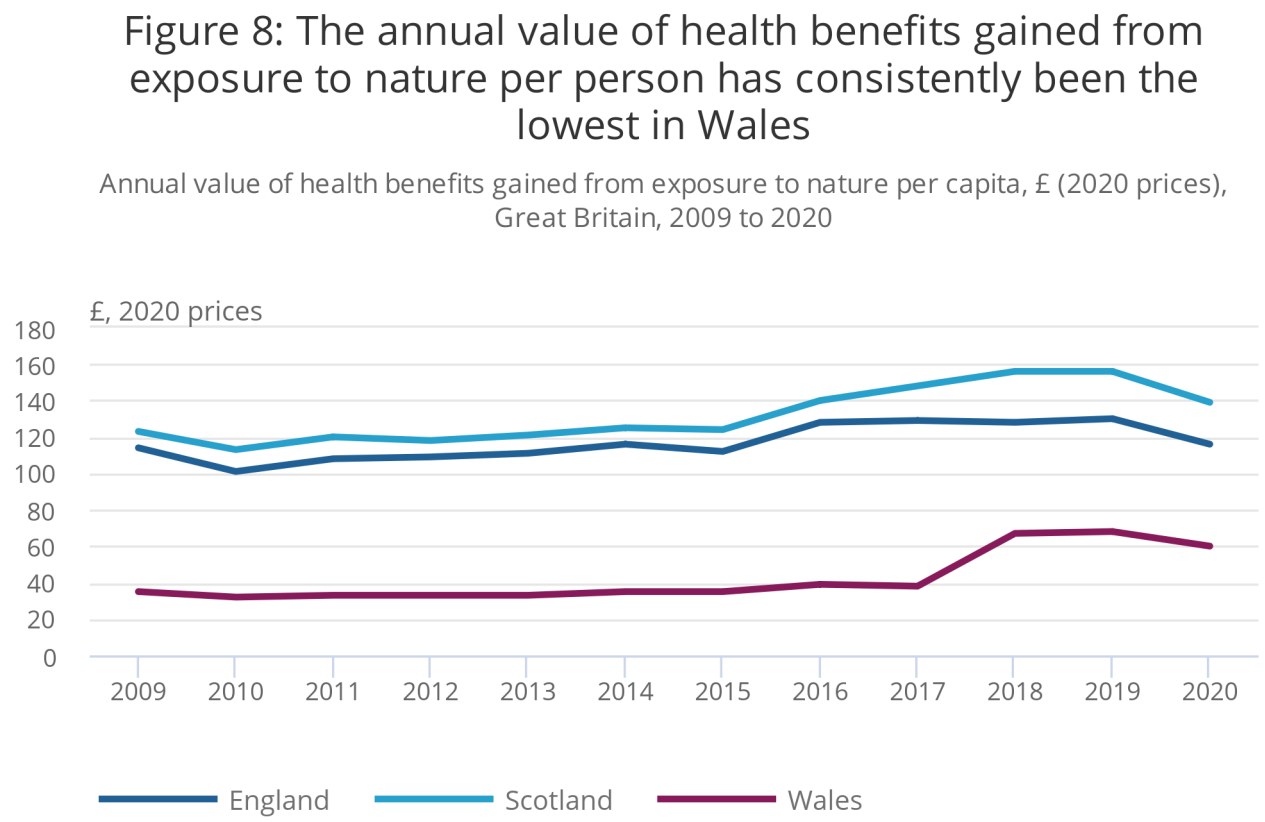
Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

Figure 8 shows the annual value of benefits gained from exposure to nature per person within each country in Great Britain. Wales consistently had the lowest value of benefits gained per person, estimated at £60 in 2020.

The sudden changes are likely to have arisen from imputation, as recreation data for Scotland and Wales are not available every year. However, the level of the data is driven directly by available survey data. This is transparent for Scotland in the years between 2017 and 2018, and for Wales 2016 and 2018. Data for these years were available in Scotland's People and Nature Survey (SPANS) and the National Survey for Wales (NSW) respectively, which set their trend lines to leap apart from the line of imputation.

Figure 8: The annual value of health benefits gained from exposure to nature per person has consistently been the lowest in Wales

Annual value of health benefits gained from exposure to nature per capita, £ (2020 prices), Great Britain, 2009 to 2020



Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

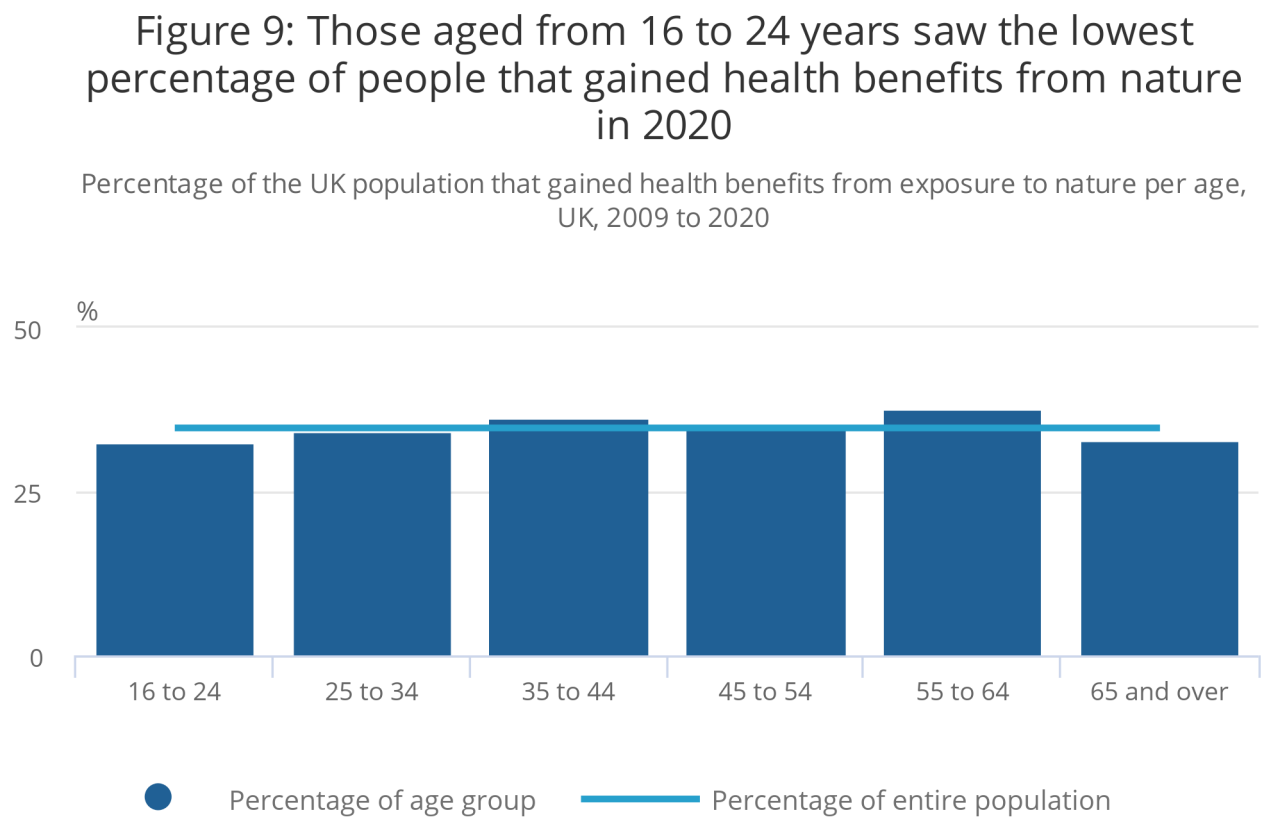
Figure 9 shows the percentage of the UK population that gained health benefits from exposure to nature in 2020, across various age ranges. This value was estimated to be 35% in 2020 for all ages.

Throughout the entire time series, and in 2020, a smaller percentage of people in the UK aged 16 to 24 years and 65 years and over gained health benefits from exposure to nature, compared with all ages. In 2020, 33% of those aged 16 to 24 years and 65 years and over gained health benefits from exposure to nature.

Between 2009 and 2020, the gap between the age groups with highest and lowest percentages who gained benefits reduced. In 2009, the difference between the highest percentage, 40% of those aged 35 to 44 years, and the smallest percentage, 25% of those aged 65 years and over, was 15 percentage points. By 2020, this value had fallen to five percentage points.

Figure 9: Those aged from 16 to 24 years saw the lowest percentage of people that gained health benefits from nature in 2020

Percentage of the UK population that gained health benefits from exposure to nature per age, UK, 2009 to 2020



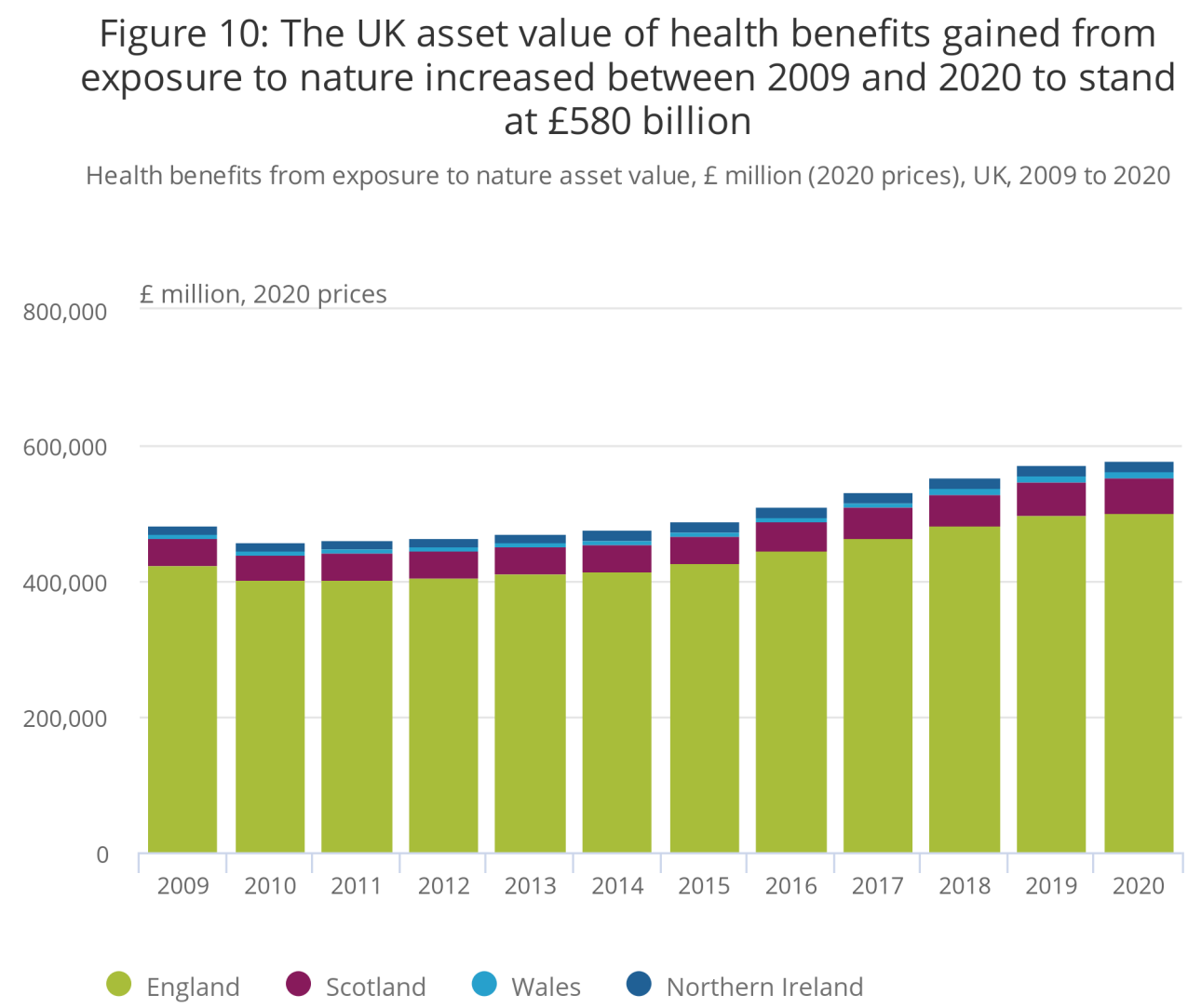
Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

Figure 10 shows the UK's estimated asset value of the health benefits gained through exposure to nature. This increased 21% between 2009 and 2020, from £480 billion in 2009 to £580 billion in 2020.

In 2020, the asset value of the health benefits gained through exposure to nature per person in the UK was estimated to be £10,700. Scotland has the highest estimated asset value per person in 2020, at £11,100. England and Northern Ireland were closer to the UK average at £11,000 and £10,100, respectively, while Wales had the lowest asset value per person, at £4,100.

Figure 10: The UK asset value of health benefits gained from exposure to nature increased between 2009 and 2020 to stand at £580 billion

Health benefits from exposure to nature asset value, £ million (2020 prices), UK, 2009 to 2020



Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

5 . Comparing results

Figure 11 shows the total number of people (equivalent) in the UK who gained health benefits from recreation. Between 2010 and 2019, both methodologies saw gradual increases to the number of benefits gained.

In 2019, the number of people (equivalent) who gained health benefits from outdoor exercise within the UK was estimated to be 9.0 million, compared with 21.1 million who gained benefits from exposure to nature. A larger number of people spent 120 minutes or more in nature each week, compared with exercising for 30 minutes, five times a week.

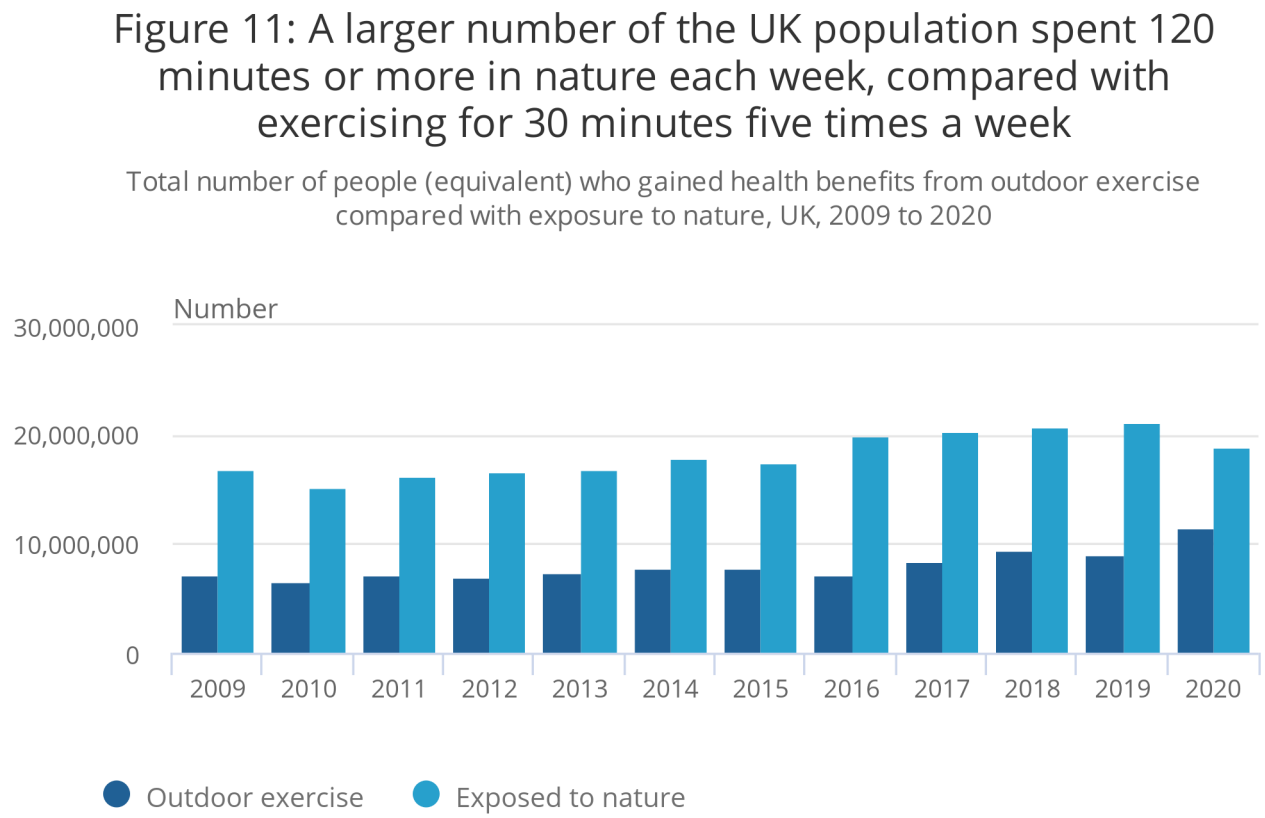
However, in 2020, the number of people (equivalent) who gained benefits from exposure to nature fell compared with 2019, to 18.9 million. This was because of the average duration of visits to nature decreasing, leading to fewer numbers of people spending 120 minutes or more in nature each week.

During the same period, benefits from outdoor excise increased to 11.5 million in 2020, because of a larger portion of the UK public completing five 30-minute sessions of exercise per week. This could be because of people spending more of their restricted time outdoors on exercising during the coronavirus (COVID-19) pandemic.

Furthermore, of those who did gain health benefits from outdoor exercise, the number of exercise sessions that took place outdoors increased, across the time series. In 2009, an average of 3.7 exercise sessions took place outdoors per person who gained benefits, compared with 4.1 in 2020.

Figure 11: A larger number of the UK population spent 120 minutes or more in nature each week, compared with exercising for 30 minutes five times a week

Total number of people (equivalent) who gained health benefits from outdoor exercise compared with exposure to nature, UK, 2009 to 2020



Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

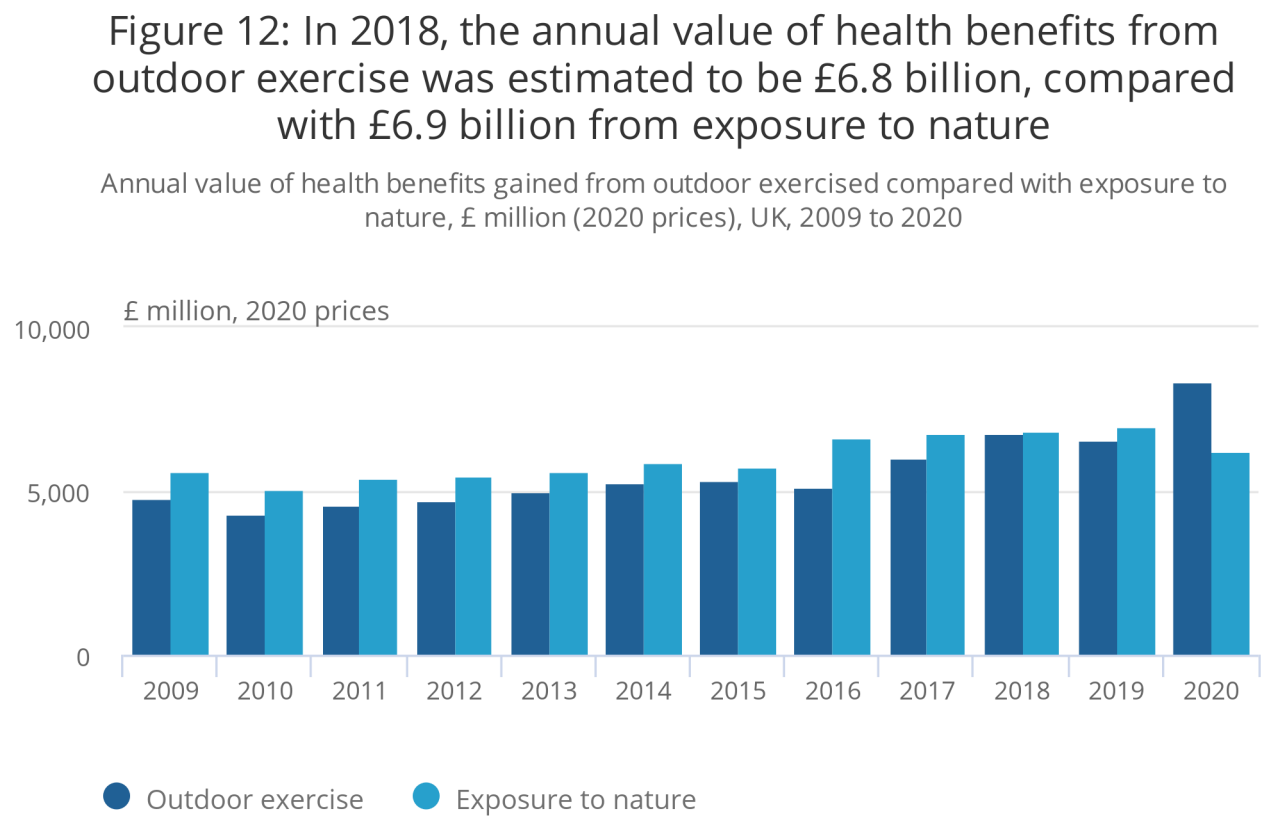
Despite using different methodologies to evaluate the impact of health benefits of recreation, both produced similar figures for annual values in most years. For example, in 2018 the annual value of health benefits from outdoor exercise was estimated to be £6.8 billion, compared with £6.9 billion from exposure to nature. This is because the average value of the benefits gained in the UK from outdoor exercise was £690 across the time series, over double the equivalent value from exposure to nature of £340.

The annual value of health benefits derived from outdoor exercise and exposure to nature both saw increases. Between 2009 and 2019, before coronavirus restrictions in 2020, the estimated annual value of health benefits gained from outdoor exercise increased 37%, a rise of £1.8 billion. Over the same period, benefits gained from exposure to nature rose by 25%, increasing by £1.4 billion.

Benefits gained from exposure to nature remained higher than outdoor exercise for all years other than 2020. While estimated health benefits of outdoor exercise in 2020 continued to increase, from £6.6 billion in 2019 to £8.4 billion in 2020, the estimated value for exposure to nature decreased from £7 billion in 2019 to £6 billion in 2020. Both trends were driven by sizeable changes in the number of people (equivalent) gaining benefits in each case.

Figure 12: In 2018, the annual value of health benefits from outdoor exercise was estimated to be £6.8 billion, compared with £6.9 billion from exposure to nature

Annual value of health benefits gained from outdoor exercised compared with exposure to nature, £ million (2020 prices), UK, 2009 to 2020



Source: Monitor of Engagement with the Natural Environment, Scotland's People and Nature Survey, National Survey for Wales, and People and Nature Survey

Figure 13 compares the proportion of the UK population that gained health benefits from either outdoor exercise or exposure to nature, across various age ranges. Within both models, generally a smaller percentage of people aged between 16 and 24 years and 65 years and over gained benefits compared with all ages across the period.

Figure 13: In both models, a smaller percentage of people aged from 16 to 24 years and 65 years and over gained benefits compared with all ages

Percentage of the UK population that gained health benefits from either outdoor exercise or exposure to nature, UK, 2009 to 2020

Download the data

.xlsx

As both methodologies draw on the same surveys, many people would qualify to gain health benefits from both outdoor exercise and exposure to nature. A person completing five 30-minute sessions of outdoor exercise per week would also spend more than 120 minutes a week in nature, so gain benefits under both approaches.

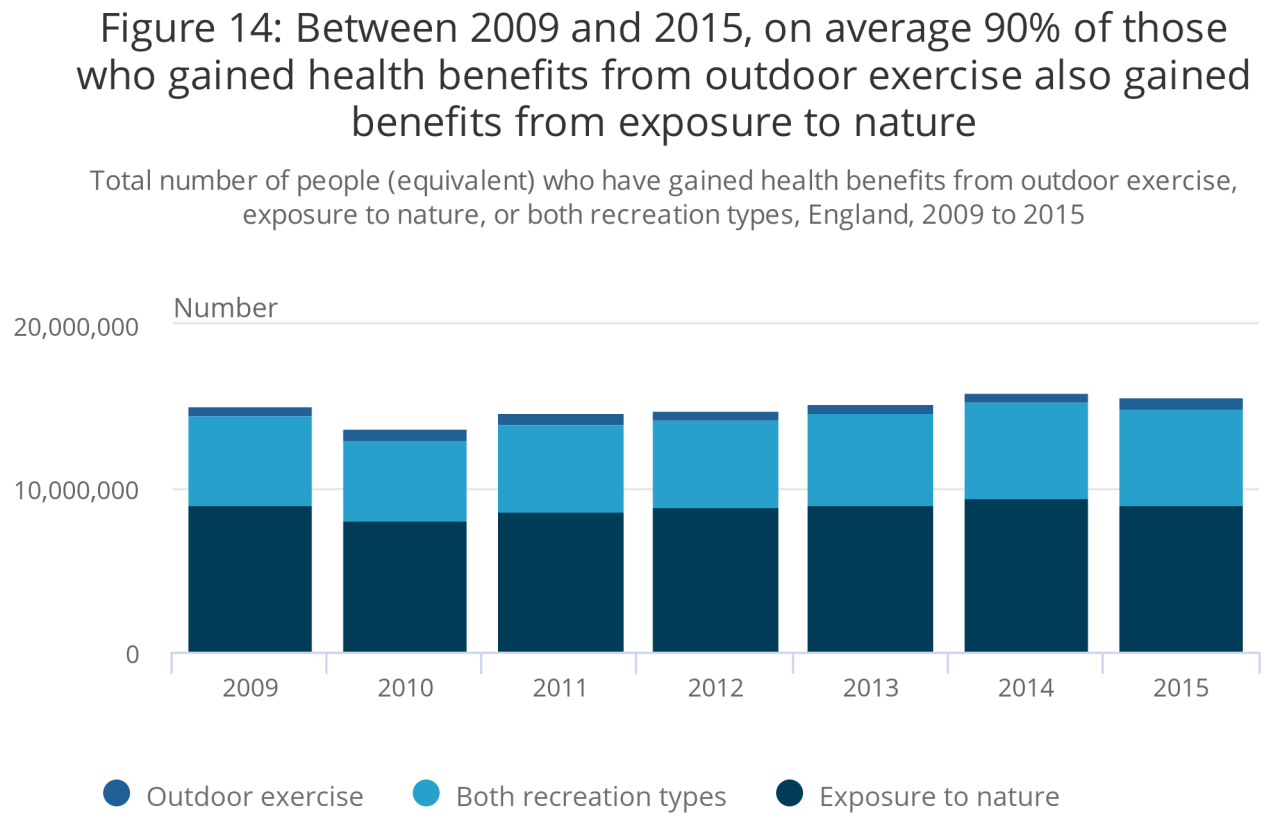
To illustrate the overlap, Figure 14 shows for England the number of people (equivalent) who gained benefits from both recreation types and for each approach exclusively. Because of complexities with the recreational surveys, the figure shows only data from the Monitor of Engagement with the Natural Environment (MENE) survey for a limited portion of the time series.

In 2015, 5.9 million people (equivalent) gained benefits from both methods, 9.0 million gained benefits only from exposure to nature, and 0.6 million gained health benefits only from outdoor exercise. On average, between 2009 and 2015, 90% of those who gained health benefits from outdoor exercise also gained benefits from exposure to nature. The monetary value of the health benefits gained from this group were responsible for 96% of the health benefits gained from outdoor exercise in total.

By comparison, 38% of those who gained health benefits from exposure to nature also qualified for benefits from outdoor exercise on average, between 2009 and 2015. A larger number of people gained benefits from the exposure to nature method, including the majority of those who gained benefits from the outdoor exercise.

Figure 14: Between 2009 and 2015, on average 90% of those who gained health benefits from outdoor exercise also gained benefits from exposure to nature

Total number of people (equivalent) who have gained health benefits from outdoor exercise, exposure to nature, or both recreation types, England, 2009 to 2015



Source: Monitor of Engagement with the Natural Environment

Neither model individually captures all of the health benefits gained from outdoor recreation. While we can determine the overlap between the two methods, it is difficult to determine the extent of overlap for each type of benefit gained. This makes it a challenge to unravel and add both methods together without double counting the benefits gained.

The monetary value of the benefits gained through the outdoor exercise approach are larger on average, compared with the exposure to nature approach. However, the number of people that can access these benefits are limited as not everyone can or will perform "moderate exercise". Furthermore, the health benefits being estimated originate from exercise in any location, rather than in nature directly. Any additional benefit gained from exercising specifically in nature, as opposed to indoors, is not captured by these approaches.

The divergence of the two methods during 2020 with coronavirus (COVID-19) pandemic-related restrictions was interesting. We will continue to use both approaches to monitor the effect of loosening of such measures. The disparities between the methods also highlights the value of access to free space to exercise.

Within our Access to gardens and public green space in Great Britain article, we noted that areas least likely to have homes with private gardens are also most likely to be close to a public park. As time spent within a private garden does not count as recreation in these approaches, people in dense urban areas are perhaps more likely to gain benefits because they make use of public green space.

Taking all of the issues together, we propose to use the exposure to nature approach to estimate the health benefits of recreation in the short term. This provides cautious estimates that directly assess the benefits of the outdoors, capture a wider range of these benefits, and represent a broader set of the public. In the future, we will look to bring the additional benefits of moderate and more vigorous exercise to our estimates.

6 . Health benefits from recreation, natural capital data

Health benefits from recreation, natural capital, UK – supplementary tables
Dataset | Released 27 May 2022
Physical (non-monetary) and monetary estimates of the health benefits gained from nature-based recreational activities.

7 . Glossary

Natural asset

A natural asset is a resource that can generate goods or services to humans into the future. Asset valuation estimates the stream of services that are expected to be produced by the natural resource over a reasonably predictable time horizon.

8 . Measuring the data

The data underpinning this bulletin come from a range of sources with different timeliness and coverage.

Data sources include:

- EFTEC (Economics for the Environment Consultancy)
- Monitor of Engagement with the Natural Environment (MENE)
- People and Nature Survey (PANS)
- National Survey for Wales (NSW)
- Scotland's People and Nature Survey (SPANS)

9 . Strengths and limitations

This publication uses data from a range of recreational surveys, including the Monitor of Engagement with the Natural Environment (MENE), People and Nature Surveys (PANS), Scotland's People and Nature Survey (SPANS) and the National Survey for Wales (NSW). Collectively, these surveys provide a large amount of detail about the state of recreation within England, Scotland and Wales.

Together, MENE and PANS provide a near-complete time series that estimates the health benefits of recreation in England between 2009 and 2020. However, SPANS and the NSW, which provide similar data for Scotland and Wales respectively, do not collect responses in every year.

Currently imputation is being used to generate a full time series. Often, the time series for England is used to interpolate missing data for Scotland and Wales. Furthermore, we do not currently use a recreational survey to estimate health benefits for Northern Ireland. Instead, this data are imputed from data for England, based on the ratio of population sizes between England and Northern Ireland.

It is unlikely that the benefits gained in England are a fully accurate representation of the benefits gained within Northern Ireland. The habits and access to nature of Northern Ireland residents are likely to be different to English residents. As a result, it is likely that our estimates of Northern Ireland are not accurate. We plan to undertake further work to improve estimates for Scotland and Wales, as well as to identify a suitable survey for Northern Ireland.

The methodology used to determine exercise-based health benefits from recreation requires insight into how active respondents are. From 2009 to 2015, the MENE survey asked respondents how many times a week they did 30 minutes of moderate to intense physical activity. The MENE survey in 2016 and 2018 did not ask this question, and neither does SPANS or NSW.

As a result of this, average proportions generated from MENE data between the years 2009 and 2015 are applied. However, it is likely that alternative data are available to understand physical activity levels in the devolved administrations of Scotland and Wales. We will also undertake further work on additional data sources as a proxy for physical activity.

We will do further work to integrate estimates of the health benefits of recreation into our existing recreation and tourism account. During this, care must be taken to avoid double counting with our current methodologies.

Additional information about this topic can be found within the methodology report. We welcome any feedback on the methods and data presented in this report.

10 . Related links

Health benefits from recreation methodology, natural capital, UK
Methodology | Released 27 May 2022
The methodology used to develop estimates of the health benefits gained from outdoor recreation in the UK.

UK natural capital accounts: 2021
Bulletin | Released 12 November 2021
Estimates of the financial and societal value of natural resources to people in the UK.

One in eight British households has no garden
Article | Released 14 May 2020
The percentage of homes without a garden is higher among ethnic minorities, with Black people in England nearly four times as likely as White people to have no outdoor space at home.

Tourism and outdoor leisure accounts, natural capital, UK: 2021
Bulletin | Released 28 April 2021
In this bulletin we put into practice new methods for estimating the value of tourism and outdoor leisure in the UK.