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Investigating use of the outdoors across adult population groups in Scotland

Final report

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Executive Summary

Background

This report presents the results of research which investigated disparities in outdoor recreation participation rates across adult population groups in Scotland and considers the implications of these findings for understanding inequalities in outdoor access.

In 2016 just under half of Scottish adults made at least one recreational visit a week to the outdoors. In this report the 'outdoors' refers to open spaces in the countryside as well as in towns and cities, such as woodland, parks, farmland, paths, beaches etc. Spending time outdoors in natural environments is associated with a range of physical and mental health and wellbeing benefits. It is therefore important to understand how equitably these benefits of outdoor access might be distributed in the population.

Research questions

The aim of the study was to investigate population-scale differences in engagement with the outdoors across different subgroups in the Scottish adult population, with a focus on groups defined by protected characteristics (as defined by the Equality Act 2010), and in relation to area deprivation and urban-rural classification. Three research questions were addressed:

1. Are there statistically significant differences between population subgroups in terms of the proportion of people using the outdoors at least once a week?
2. Can any differences between subgroups be explained by geographic/area-level factors (i.e. area deprivation and urban-rural classification)?
3. To what extent do other individual characteristics (e.g. education, employment status, household type, perceptions of the local area) explain frequency of visits to the outdoors?

Approach

The study investigated people's use of the outdoors on at least a weekly basis, a focus which is in line with the Scottish National Indicator 'Increase people's use of Scotland's outdoors'. This involved statistical modelling to examine the relationships between use of the outdoors and a number of personal characteristics (e.g. age, sex, ethnicity) and area-level factors (area deprivation and urban-rural classification). The statistical approach allowed us to examine the effects of the different factors. We produced a 'main' model to address the first two research questions and an 'exploratory' model to examine the third question. The analysis used data from the Scottish Household Survey 2014 and 2016.

Key findings

The main models show that use of the outdoors at least once a week was significantly associated with disability status, religion, ethnicity, age, area deprivation, marital status, and urban-rural classification in both 2014 and 2016.

Overall, the population groups least likely to report using the outdoors on a weekly basis (across both years) were:

- People with a disability
- Muslims
- Residents in Scotland's most deprived areas
- Black and other non-white minority ethnic groups
- People aged 76 and over

The models also showed a lower likelihood of weekly use by those who have never been married and by separated/divorced/widowed individuals. There were mixed findings between the 2014 and 2016 data for some age groups, gender and those of Christian faith. Use of the outdoors was not related to sexual orientation. There was also some evidence to suggest that living *outside* Scotland's urban areas (particularly in remote rural areas and remote small towns) was positively associated with use of the outdoors at least once a week. Area deprivation and urban-rural classification did not explain associations between membership of protected groups and use of the outdoors.

The exploratory models (Appendix C) highlighted a number of other characteristics which were positively associated with recreational use of the outdoors on at least a weekly basis between the 2014 and 2016 study years. These were part-time working, being educated to degree-level, having greenspace within a 5 minute walk from home, rating one's neighbourhood as a very good place to live, high neighbourhood social capital scores, having lived at current address for less than three years, and walking for travel.

Despite a number of the factors emerging as significant predictors of outdoor participation, the explanatory power of the models was low. This emphasises that there are likely to be numerous other variables which influence use of the outdoors to a greater degree than those we have been able to include in this study.

Conclusions and recommendations

The study provides evidence of differences in use of the outdoors between population subgroups, many of which were consistent across two non-consecutive years. Based on these findings we offer the following policy recommendations:

1. **Programmes promoting use of the outdoors should encourage the inclusion of key target groups.**
   The findings identify a number of groups who are using the outdoors less frequently, pointing toward potential priority target groups for programmes promoting outdoor recreation. The reasons for lower participation by certain particular groups tend to be multiple and complex.

Promoting participation in such groups must therefore go further than targeted marketing; the particular experiences and needs of target groups must be taken into account.

2. **The Scottish Government should continue to support population-scale research on outdoor recreation participation, its determinants and potential outcomes.**
   The relatively low explanatory power of the models suggests that we need to look at other factors beyond those for which we have Scottish Household Survey data in order to better understand outdoor engagement at the population scale. Topic-based social surveys such as Scotland's People and Nature Survey (SPANS) offer significant opportunities in this respect. The research also highlights the value of repeated surveys providing a time series of data.

Contents

1. Introduction

1.1 Purpose of this report

This report investigates differences in outdoor recreation participation rates across adult population groups in Scotland and considers the implications of these findings for understanding inequalities in outdoor access.

1.2 Why focus on use of the outdoors across population groups?

In 2016, 48.5% of Scottish adults made at least one recreational visit to the outdoors a week[1]. The 'outdoors' refers to open spaces in the countryside as well as in towns and cities, such as woodland, parks, farmland, paths, beaches etc.

There is a wealth of evidence on the health and wellbeing benefits people derive from engaging in outdoor physical activity, relaxing and enjoying contact with nature, and from positive social interactions in the outdoors (Keniger et al., 2013; Ward Thompson, 2011). Interacting with natural environments may also facilitate connections to local landscape and motivations to care for the environment (Halpenny, 2010). Understanding differences in use of the outdoors by different population groups is important as it has implications for how such benefits of nature might be distributed across the population.

1.3 Policy context

Promoting use of the outdoors is relevant to a number of national policies, particularly across the environment, health, planning and tourism domains (Figure 1). The **proportion of adults making one or more visits to the outdoors a week** is used as a progress indicator in the National Performance Framework's National Indicator 'Increase people's use of Scotland's outdoors', and in the monitoring of outcomes of the Land Use Strategy.

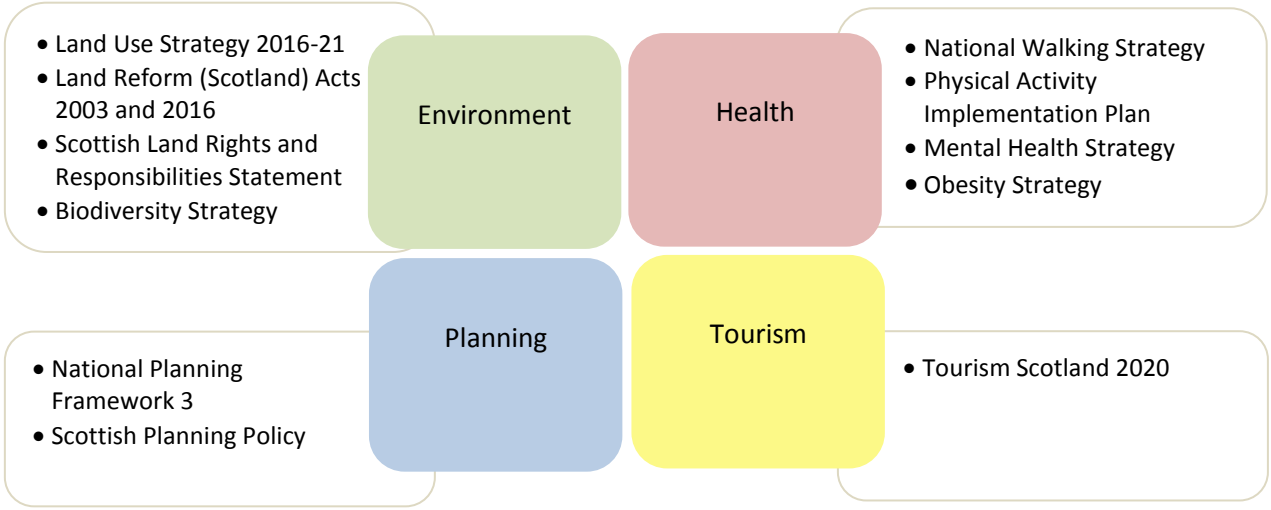

Figure 1: Key national policies associated with promoting use of the outdoors in Scotland.

[1] Scottish Household Survey 2016

The UK Equalities Act 2010 gives legal protection against discrimination on the basis of 9 particular characteristics set out in the Act. These '**protected characteristics**' are:

- Age
- Disability
- Sex
- Race
- Religion or belief
- Pregnancy and maternity
- Marriage and civil partnership
- Sexual orientation
- Gender reassignment

The Act also sets out certain Public Sector Equalities Duties. These state that public bodies must have 'due regard' to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. The Scottish Government also aims to promote equality between more and less deprived areas and across urban and rural areas. For this reason, the research considers not only groups defined by protected characteristics but also by:

- Area deprivation (using the Scottish Index of Multiple Deprivation [SIMD])
- Urban-rural classification (using the 6-fold Urban-rural classification 2013/14)

Evidence on inequalities in engagement with the outdoors between groups may help to inform Equality Impact Assessments (EqIAs) undertaken in accordance with Public Sector Equalities Duties. It can also help to identify priority groups for targeting resources to facilitate outdoor use.

1.4 Headline statistics on outdoor engagement amongst population groups

The key source of data on use of the outdoors in Scotland is the Scottish Household Survey (SHS). The SHS collects individual-level data on several protected characteristics, in addition to use of the outdoors, and links the data to area-level information on area deprivation (SIMD) and urban-rural classification. Appendix A reports the overall percentage of adults (16 years and over) using the outdoors at least once a week by population group for 2014 and 2016 separately. Both years of data were used in the present study (see Section 2 Methods). Descriptive analysis of outdoor use and other environmental factors by equalities characteristics is also available via the Scottish Government's Equality Evidence Finder.

1.5 Gaps in the evidence

Descriptive analysis (such as that shown in Appendix A) gives a useful overview of population scale patterns. What it does not do, however, is allow us to provide insights on the effects of **different factors**. For example, the effects of individual (protected) characteristics on use of the outdoors may be difficult to disentangle from each other as well as from geographic/area-level factors such as area deprivation and urban-rural classification. This raises further questions around the extent to which, for example, age effects are attributable to differences in the prevalence of disabilities, or whether observed differences in use of the outdoors between ethnic groups are actually a result of more of Scotland's black and minority ethnic (BME) population living in urban areas (Scottish Government, 2017a). Questions like these have important implications for how inequalities in participation are understood, prioritised and addressed.

1.6 Aim and research questions

The aim of the study was to investigate population-scale differences in engagement with the outdoors across different subgroups in the Scottish adult population. Three research questions (RQs) were addressed:

1. Are there statistically significant differences between population subgroups in terms of the proportion of people using the outdoors at least once a week?
2. Can any differences between subgroups be explained by area-level factors (i.e. area deprivation and urban-rural classification)?
3. To what extent do other individual characteristics (e.g. education, employment status, household type, perceptions of the local area) explain frequency of visits to the outdoors?

2. Methods

2.1 Data sources

Our analyses used data from the Scottish Household Survey (SHS) in 2014 and 2016. The SHS is an annual survey designed to be representative of the Scottish population[2]. Data were drawn from the random adult portion of the survey which gathers individual-level data from randomly selected adults (aged 16 years and over) within the surveyed households. This resulted in a sample size of N=9,799 in 2014 and N=9,642 in 2016. Data for the two years were subject to separate analyses (rather than being combined) to allow us to examine whether patterns in use of the outdoors across groups were consistent over time.

2.2 Modelling approach

Binary logistic regression models were used to predict **use of the outdoors on at least a weekly basis[3]** (in line with the 'Increase visits to the outdoors' National Indicator) based on individuals' membership of given groups, e.g. age groups, sex, ethnic group. This technique allowed us to test for statistically significant associations between each factor and use of the outdoors, *whilst controlling for the effects of other individual and area-level factors*. The results therefore allow us to isolate effects of particular characteristics, all else being equal.

The variables used to predict use of the outdoors (one or more visits to the outdoors per week) are summarised in Table 1. Appendix B provides more detailed description of the variables.

[2] Further information about the Scottish Household Survey and its methodology can be found here: http://www.gov.scot/Topics/Statistics/16002

[3] The outcome variable 'use of the outdoors' was derived from the SHS question: 'How often, on average, have you taken visits to the outdoors for leisure and recreation in Scotland in the last 12 months?' The question also provided the definition of 'outdoors' given above in Section 1.2, and advised that visits could include leisure trips taken from home or away from home on holiday in Scotland and might include everyday activities like dog walking as well as activities like mountain biking or kayaking.

For each year there are two statistical models presented:

- **Main model** - Hierarchical model in which the variables are entered in two steps. In step 1 the individual-level variables relating to protected characteristics are entered. In step 2 area-level variables are added. The main models address RQs 1 and 2. The main model is shown in Table 2.
- **Exploratory model** - This model extends the main model to consider the extent to which a range of other factors contribute to explaining individuals' likelihood of using the outdoors at least once a week. The exploratory models address RQ 3. The exploratory model is shown in Appendix C.

Table 1: Summary of independent variables used in the models

Type of variable	Variables	Relevant model(s)
Protected characteristics	age, disability, sex, race/ethnicity[4], religion, sexual orientation, marriage/civil partnership status.	Main and exploratory
Area-level characteristics	urban-rural classification (6-fold), area deprivation (SIMD quintile).	Main and exploratory
Additional exploratory factors	employment status, education, driving licence possession, caring responsibilities, walking distance to greenspace, satisfaction with greenspace, neighbourhood satisfaction, community belonging, feelings of safety in neighbourhood, neighbourhood social capital, time lived at current address, walking for travel, presence of children in the household, whether lives in single adult household.	Exploratory only

The additional variables investigated in the exploratory model were those SHS variables identified as having a theoretically plausible influence on outdoor recreation behaviour. These were selected for inclusion based on knowledge of the literature on use of the outdoors and feedback from stakeholders (Scottish Government and Scottish Natural Heritage) on the study's interim report.

The analyses were weighted to correct for sampling bias, using standard procedure and weighting values supplied as part of the SHS dataset.

3. Results and discussion

3.1 Overarching findings

The findings on the relationships between use of the outdoors and the variables in Table 1 (above) are discussed in detail in Sections 3.2 (addressing RQs 1 and 2) and 3.3 (addressing RQ 3). Before considering these relationships, it is important to highlight two overarching key findings from the analysis. Firstly, despite including a large number of variables which could plausibly affect outdoor recreation participation, the models only explained a small proportion of the variability in the dependent variable (use of the outdoors at least once a week), as indicated by the R^2 values[5] for the models. The main models (Table 2) explained somewhere between 4.5 and 6.0% of the variability in

[4] SHS collects detailed data on ethnic group membership. Our analysis aggregates white ethnic groups and compares against particular non-white ethnic groups (see Appendix B).

[5] An R^2 value of 1.0 (or 100%) would indicate a model that perfectly explains the outcome in question. In the behavioural sciences, R^2 values are often low due to complexity of human attitudes and behaviours.

use of the outdoors in Step 1, which rose to between 5.8 and 7.8% after adding the area-level variables in Step 2. Adding in the additional exploratory variables (Appendix C) did not improve the explanatory power of the model, despite some of these additional factors being significantly related to use of the outdoors.

The low explanatory power of the models suggests that much of the variability in use of the outdoors results from factors we were not able to include in our analyses. Such factors might relate to aspects of an individual's identity (e.g. seeing oneself as an outdoorsy person), emotions (e.g. emotional connectedness to nature in general and to specific greenspaces), interests (e.g. in nature, particular hobbies or sports), personal history (e.g. early childhood experiences of outdoor recreation) and current circumstances (relating for instance to dog ownership, social networks). These issues are being investigated further in other parts of the Landscapes and Wellbeing research in the RAFE Strategic Research Programme 2016-21 (Colley et al., 2017; Irvine et al., 2018).

The second overarching finding to note is that, although some variables were consistently associated with use of the outdoors across both the study years, there were also a number of inconsistencies. This suggests that there is not one single set of factors which influence outdoor recreation participation at the population scale from year to year. It is possible that some of these inconsistencies may be related to annual variations in weather and climate, or possibly to important cultural and sporting events, however more research is needed to understand the role of such factors in relation to outdoor recreation participation at the population scale. This finding also highlights the value of examining multiple waves of social survey data, where available, since single cross-sectional snapshots may lead us to assuming that some patterns or inequalities (e.g. between men and women) are more entrenched than they actually are.

3.2 Between-group disparities in use of the outdoors

The main models (Table 2) showed statistically significant relationships between use of the outdoors and age, disability, sex, ethnicity, religion, marital/civil partnership status, urban-rural classification and SIMD.

Age

The statistical approach used involves comparing the reference age category (age 46-55) against each of the other age bands[6]. Across both the 2014 and 2016 main models, **those in the 76+ age group were significantly less likely to visit the outdoors at least once a week** than the reference group. The results were less clear in relation to other age categories. In 2014, those in the 56-65 and 66-75 groups were also less likely to report weekly participation but no such differences were found for 2016. In 2016, those aged 16-25, 26-35 and 36-45 were all significantly more likely than the 46-55 age group to report weekly outdoor use.

[6] Age 46-55 was selected as the reference category because it was the largest of the age groups studied. This is standard procedure in the specification of such statistical models.

Table 2: Main logistic models predicting likelihood of visiting the outdoors at least once a week. Data source: Scottish Household Survey 2014 and 2016.

	2014		2016	
	Step 1: Individual-level factors	**Step 2: Area-level factors**	**Step 1: Individual-level factors**	**Step 2: Area-level factors**
	Odds ratio	*Odds ratio*	*Odds ratio*	*Odds ratio*
Age				
Age 16-25	n/s[2]	n/s	1.467**	1.467**
Age 26-35	n/s	1.188*	1.241**	1.301**
Age 36-45	n/s	n/s	1.342**	1.376**
Age 46-55 (ref[1])	-	-	-	-
Age 56-65	.858*	.833*	n/s	n/s
Age 66-75	.749**	.738**	n/s	n/s
Age 76+	.614**	.588**	.692**	.661**
Disability				
Disability	.350**	.371**	.372**	.402**
Sex				
Male (ref)	-	-	-	-
Female	.830**	.827**	n/s	n/s
Race/Ethnicity				
White (ref)	-	-	-	-
BME	.638**	.683*	.563**	.562**
Religion				
No religion (ref)	-	-	-	-
Christian	n/s	n/s	.839**	.841**
Muslim	.489**	.546*	.517**	.545**
Other	n/s	n/s	n/s	n/s
Sexual orientation				
Heterosexual/straight (ref)	-	-	-	-
LGBO	n/s	n/s	n/s	n/s
Marriage and civil partnership status				
Married (ref)	-	-	-	-
Never married	.777**	.849*	.728**	.795**
Separated/divorced/widowed	.764**	.815**	.791**	.860*
Urban-rural classification				
Large urban areas (ref)	-	-	-	-
Other urban areas	-	n/s	-	n/s
Accessible small towns	-	1.262**	-	n/s
Remote small towns	-	1.685**	-	1.536**
Accessible rural areas	-	1.332**	-	n/s
Remote rural areas	-	1.888**	-	1.486**
Area deprivation (SIMD quintile)				
SIMD 1	-	.588**	-	.567**
SIMD 2	-	.654**	-	.690**
SIMD 3	-	.647**	-	.746**
SIMD 4	-	.726**	-	.856*
SIMD 5 (ref – least deprived)	-	-	-	-
N	9679	9679	9567	9567
Pseudo R^2	.045-.060	.059-.078	.045-.059	.058-.077

NOTE: BME = Black and other non-white minority ethnic groups; SIMD = Scottish Index of Multiple Deprivation. **Statistically significant at 1% level; * Statistically significant at 5% level.

[1] Ref = Reference category (not entered into the model). Odds ratios represent the comparison with the reference category which has a value of 1. Odds ratios >1 indicate a greater likelihood of using the outdoors at least once a week compared to the reference group, with odds ratios <1 indicating a lower likelihood.

[2] n/s = Not significant

However, in 2014 only those aged 26-35 were significantly more likely to report weekly outdoor use than the reference group, and only when controlling for urban-rural classification and area deprivation (model step 2; see Table 2). Further analysis indicated that the reason for the different patterns in 2014 and 2016 was that, within several of the age groups, participation rates had changed over this period. For example, there was a significant drop in weekly use of the outdoors amongst the 46-55 reference group and a significant increase in the 16-25, 36-45, and 66-75 groups.

These findings are broadly in line with the existing international literature on age differences in outdoor recreation participation and greenspace use. Studies have found inconsistent effects of age, which suggests that the relationship between age and outdoor recreation/greenspace use is complex (Lee & Maheswaran, 2010). Where age effects have been found, these have tended to highlight lower participation rates amongst older adult and young adult/teenager groups (Lee & Maheswaran, 2010; Schipperijn et al., 2010a). Although several studies indicate a drop off in older age it is difficult to identify when this tends to occur on average, due to differences between studies in the age bandings applied and reference categories used in models. Previous data for Scotland from Scotland's People and Nature Survey 2013/14 (TNS, 2014) indicated a drop off from around the age of 55. This is consistent with our 2014 model but not the 2016 model – there is evidence from across the two survey years of a clear decline in the likelihood of visiting the outdoors at least once a weeks for >75s but no consistent drop off below that age group. This suggests that it may be useful to distinguish between the younger old and older old when considering the promotion of outdoor recreation amongst older people and highlights the importance of recognising diversity within population subgroups.

Previous qualitative research for the Scottish Government on access to outdoor recreation by older people (65 years and over) in Scotland (Colley et al., 2016) highlighted barriers to access that may help to explain why the 76+ age group were less likely to report frequent use of the outdoors. The findings highlighted that barriers for older people are multiple and interconnected, and extend far beyond simply those to do with reduced health and mobility associated with aging. Other barriers faced by older people tended to relate to a lack of or reduced social connections, feelings of fragility and vulnerability, lack of motivation and negative attitudes towards outdoor recreation, a lack of time/other commitments, safety and weather/season. The report concluded that interventions to promote use of the outdoors amongst older people should take into consideration the highly interconnected nature of the barriers that older people experience, should aim to address social barriers to outdoor engagement and may benefit from positioning themselves more in terms of offering social benefits than encouraging outdoor physical activity (Colley et al., 2016). Analysis of the data from this qualitative study also identified key moments of change in older age that marked points at which individuals' use of the outdoors declined. These included the onset of particular health problems (both those experienced by the individual and health issues of spouses and/or friends who were outdoor activity companions); spouses and/or friends passing away; dogs passing away; and moving to a new area in retirement (Colley et al., 2017).

Our models showed no evidence of a lower likelihood of at least weekly use of the outdoors by younger people (e.g. age 16-25), contrary to some of the existing international literature (Curry et al., 2001; Lee & Maheswaran, 2010; Schipperijn et al., 2010a). We should, however, note that our analysis does not take into consideration the types of outdoor environment young people use (or not). Younger people have traditionally been underrepresented amongst rural outdoor

recreationists (Curry et al., 2001). The reasons for this may relate to perceptions of the countryside or rural recreation as being something more for older people (Breakell, 2002; Kloek et al., 2017) and to differing activity preferences between groups e.g. young people preferring more adventurous and organised activities (O'Brien & Morris, 2014), as well as to financial and transport related barriers to countryside access (Ghimire et al., 2014).

Disability

Those who reported having a disability[7] were significantly less likely than those without a disability to use the outdoors at least once a week, both in 2014 and 2016. The magnitude of this disparity was greater than any other between-group differences tested in the model. There was no evidence of this effect being explained by the geographic factors of SIMD and urban-rural classification (see step 2 in Table 2 models).

These findings are in line with studies investigating effects of disabilities on use of the outdoors (Boyd et al., 2018) andgreenspace (Lee & Maheswaran, 2010), frequency of forest visits (Burns & Graefe, 2007) and on overall participation in sports and physical activity (Darcy et al., 2017; Sotiriadou & Wicker, 2014). Participation is influenced both by the type of disability a person has and the extent to which they are restricted by their condition and have specific support needs (Darcy et al., 2017; Sotiriadou & Wicker, 2014). Disabilities also impact differently on different outdoor activities. For example, Burns and Graefe (2007) report evidence from the USA that although those with disabilities were less likely to participate in outdoor recreation than their counterparts without disabilities, they were more likely to report taking part in outdoor activities focusing on nature study. The barriers to outdoor recreation for disabled people are not confined to those relating to impairment and mobility issues – other commonly cited barriers include time, energy, concerns about safety and fear of the outdoors, lack of choice in access opportunities, lack of someone to visit with, and transport and financial costs (Burns & Graefe, 2007; Henderson et al., 1995). Those who are also a member of other marginalised groups may experience a 'magnification of constraints' or 'double whammy' of barriers to outdoor participation (Darcy et al., 2017; Henderson et al., 1995).

Studies have demonstrated that people with disabilities tend to be just as interested in outdoor recreation and prefer the same types of environments as others (Burns & Graefe, 2007). O'Brien and Morris' synthesis of evidence from Forestry Commission studies across the UK reports that whilst those with a disability may be less likely to identify physical wellbeing as a benefit of visiting woodlands, they may be more likely to report mental wellbeing benefits. Qualitative studies found that participants with a disability highly valued the sense of freedom and escape from everyday life and those with mental health issues in particular discussed how visiting woodlands helped them cope with stress (O'Brien & Morris, 2014).

The social model of disability positions disability not in terms of medical conditions but as a "social relationship shaped by the privileging of normalcy and processes of exclusion across social, political and cultural relationships" (Darcy et al., 2017). Whilst disability can be viewed as a personal attribute that constrains access to outdoor recreation, this social model shifts our attention from focusing on personal constraints to considering 'disabling environments' and how to support individuals' access

[7] Disability is defined here as a long-term physical or mental health condition or illness that substantially reduces ability to carry out day-to-day activities, in line with the Equalities Act 2010 definition.

requirements (Darcy et al., 2017). Studies in the UK suggest that people with disabilities value health walks and accessible paths, sensory experiences, and also targeted interventions for those with disabilities and long-term (physical and mental) health conditions that open up access to different types of outdoor activity including adventurous activities like mountain biking (O'Brien & Morris, 2014).

Sex

The main models found a **small but statistically significant difference between males and females[8] for 2014 (with women less likely to report using the outdoors at least once a week**. There was, however, **no significant difference in 2016**.

The academic literature on gender and outdoor recreation participation shows a similarly mixed picture. Whilst some studies report men using greenspace/natural environments (Boyd et al., 2018; Lee & Maheswaran, 2010) and countryside or wild land sites (Bowker et al., 2006) more often than women, many studies find no gender differences in participation (Ho et al., 2005; Schipperijn et al., 2010b; Sjögren et al., 2011). Furthermore, gender may interact with age in its associations with outdoor recreation e.g. young women are often underrepresented in terms of physical activity and sports participation (Allender et al., 2008).

The literature highlights particular barriers to outdoor recreation that apply disproportionately to women such as feelings of fear and vulnerability in natural environments and more isolated areas (Askins, 2009; Ghimire et al., 2014; Ho et al., 2005) and gender roles and societal norms around care-giving responsibilities which can result in women feeling a lack of entitlement to leisure time in general (Day, 2000; Henderson et al., 1995). In reference to countryside sites, Askins (2009) also mentions concerns of female participants regarding lack of facilities for feeding and changing small children. The extension of gender roles into outdoor engagement can also be seen in the activity profiles of men and women (Ho et al., 2005). Men are more likely to report taking part in vigorous physical activity whereas women report more walking (either strolling, or for active travel) and activities focusing around family/children or group activities (Ho et al., 2005; Lee & Maheswaran, 2010; Sjögren et al., 2011). While there has been much interest in how women's socialisation into care-giving roles constrains their leisure behaviour, it is also important to note that having young children can motivate use of the outdoors as well as constrain it (Colley et al., 2017). At the same time, recent literature on gender, family and leisure has also highlighted ways in which outdoor activities can serve as a vehicle for resistance and empowerment of women (e.g. through achievement in pursuits not typically viewed as feminine) (Henderson & Gibson, 2013) and as a mode of self-care (Day, 2000). There is also another strand of research which suggests that some associations between local greenspace access and health outcomes may be stronger for women than men (Sander et al., 2017; Lachowycz & Jones 2013, cf. Richardson & Mitchell, 2010). One interpretation for this is that on average women spend more time in the home environment, as they remain more likely to work part-time or to be a stay at home parent than men, and therefore benefit from *greater* opportunity to access local greenspace.

[8] The SHS questionnaire asks the highest income earner in the household to answer for each member of the household: "Is [name] male or female?".

Overall the literature presents a complex picture of differences between the sexes in outdoor recreation which interact with other factors such as age, parenthood, relationship/marital status and economic activity in the production of the societal roles and identities that influence individual's outdoor engagement behaviour. By controlling for these factors as far as possible in the models, we have been able to go some way to disentangling these complex effects in our analysis of the Scottish adult population. In the exploratory models (discussed further in section 3.3) we controlled not only for the main model variables (which include age and marital status) but also other variables of relevance to gender (namely economic activity and whether there were children present in the household). This time the model (Appendix C) showed a significant difference between the sexes in use of the outdoors (with women less likely to visit at least once a week) for both 2014 and 2016. It is possible that in the initial main model for 2016 there was no difference between the sexes because of opposing positive effects of part-time working and having children in the household.

Race and ethnicity

Both the 2014 and 2016 models found **respondents from black and other non-white minority ethnic (BME) groups were significantly less likely than white respondents to use the outdoors on at least a weekly basis.** This pattern is consistent with existing evidence from Scotland e.g. SPANS 2013/14 (TNS, 2014) and England (Boyd et al., 2018) as well as international studies of outdoor recreation participation (Floyd & Johnson, 2002; Lee & Maheswaran, 2010; Morris, 2003). Ethnicity is, however, strongly associated with socio-economic factors and the BME population is largely urban-centred (Scottish Government, 2017a); analyses have often failed to account these potential confounding effects on outdoor recreation. The models (step 2 models in Table 2) demonstrate that in Scotland the difference in use of the outdoors between BME and white residents is not explained by where people live as the difference remains just as strong when we control for urban-rural classification and area deprivation.

There are many possible reasons for this difference in use of the outdoors between white and BME populations in Scotland. Particular barriers faced more by those of ethnic minority groups can include economic factors (e.g. around lack of transport), fear (of attack, discrimination, of pests and dangerous plants and animals), unease or feeling unwelcome or out of place (particularly in relation to rural settings), and language barriers (Agyeman, 2003; Ghimire et al., 2014; Koppen et al., 2014; Rishbeth, 2001; Roberts, 2015). We must be wary, however, of making simplistic generalisations about the participation of ethnic minorities (Gentin, 2011) as to build an in-depth understanding of how ethnicity influences use of the outdoors in Scotland it is essential to consider the differences in people's experiences and preferences both between and within particular ethnic groups. Unfortunately, although more detailed data on ethnic group membership were available in the SHS, it was not appropriate to include particular non-white ethnic subgroups (e.g. Asian, Caribbean, African ethnic groups) separately in our final models due to the relatively small subsample sizes for these groups (see section 3.4).

Although in this study the focus has been on use of the outdoors in broad terms, it is also worth noting that cultural differences in preferences for different outdoor settings and activities may also influence individual's outdoor recreation behaviour. There is evidence from both European and American studies to suggest that some BME groups tend to see nature in more functional terms than the white population, preferring more developed greenspaces that offer facilities for eating,

socialising and sports over wilder naturalistic settings (Gentin, 2011; Ho et al., 2005). Those of ethnic minority groups are also reportedly more likely to take part in social activities in greenspace (for example picnics and barbecues with extended family), which some have linked to social norms in different cultures (Gentin, 2011; Kloek et al., 2017). Askins (2009), however, warns against conflating ethnicity with culture; we should not automatically assume differences between ethnic groups in preferences based on potential cultural differences. Furthermore, it is not yet clear the extent to which cultural values and practices relating to the outdoors are transmitted between first, second and subsequent generation immigrants or conversely the degree to which these become blended with those associated with the native population in later generations for different ethnic groups (Gentin, 2011; Kloek et al., 2017).

Religion

Muslim respondents were significantly less likely to report using the outdoors at least once a week than those who reported no religious affiliation. This pattern was consistent across both 2014 and 2016 main models and was independent of ethnicity, urban-rural classification and area-level deprivation. Many of the same considerations discussed above in relation to ethnicity may also apply in interpreting this finding, for instance around barriers relating to perceived safety and vulnerability, economic factors, language, and cultural differences in outdoor recreation practices. Factors specific to the practice and philosophy of Islam specifically may also influence individual's engagement with the outdoors. For example, Keshavarz (2013) describes aspects of urban parks which were seen by Muslim residents in UK and German case studies as a source of discomfort, including the mixing of genders and lack of segregated areas for women and children. Attitudes towards dogs in the Islam faith may also play a part – because dogs are traditionally seen as dirty or impure, dog ownership (a common motivation for outdoor recreation) is low, and people may feel uncomfortable in environments where they are likely to encounter a dog off the lead (Keshavarz, 2013).

In 2016, Christian respondents were also less likely to participate on a weekly basis than those reporting no religious affiliation although the magnitude of the effect was much smaller. This had not, however, been the case in 2014. The reasons for this pattern are unclear. One possible interpretation might be that religious affiliation itself (regardless of the religion) could impact on use of the outdoors if adherents experience less free time for outdoor recreation due to attending religious gatherings and related community activities.

Sexual orientation

The main models tested for differences in outdoor participation between those identifying as heterosexual and those identifying as lesbian/gay, bisexual or other (abbreviated here to LGBO). There was **no significant difference found in either 2014 or 2016**. This may suggest that sexual orientation has little bearing upon use of the outdoors. Little is known about the relevance of LGBO identities to people's use and experience of the outdoors. Literature on sexuality and space does, however, highlight ways in which public open spaces may both serve to enforce conformity and power relations which favour the heterosexual (associated more with manicured, formal designs and CCTV surveillance) and act as spaces which embrace and embody difference (particularly wilder, more marginal spaces)(Gandy, 2012).

Marriage and civil partnership

The likelihood of reporting use of the outdoors on at least a weekly basis varied significantly according to individuals' marital/civil partnership status**. Respondents who had never been married/in a civil partnership, and those who were separated, divorced or widowed, were significantly less likely to report at least weekly visits than respondents who were currently married or in a civil partnership**, both in 2014 and 2016.

The finding that those who have never been married are less likely to participate than married individuals is in line with recent analysis of outdoor recreation participation in England. This study by Boyd et al. (2018) found that married/cohabiting individuals were more likely to visit the outdoors than single/widowed/divorced respondents. A number of other international studies have, however, found no difference between married, cohabiting and single adults in terms of greenspace use (Schipperijn et al., 2010a) and outdoor recreational physical activity (Sjögren et al., 2011). It is notable that our findings contrast with some of the literature on physical activity in general that suggests an overall decline in physical activity with marriage (Allender et al., 2008), however such effects may also be confounded by parenthood (Bellows-Riecken & Rhodes, 2008). In an investigation of life history accounts of outdoor recreation behaviour by older adults in Scotland (Colley et al., 2017) it was found that (for this cohort at least) getting married and having children were inseparable life course transitions that affected outdoor recreation in a number of ways. These included giving up outdoor hobbies and sports of their youth in favour of adopting new (often less vigorous) activities undertaken as a couple or a family.

The finding that those who were divorced, separated or widowed were less likely to participate on at least a weekly basis is in line with other international studies (Allender et al., 2008; Schipperijn et al., 2010a). Being widowed was mentioned in the life history accounts of several participants in the study by Colley et al. (2017) as a moment of change where use of the outdoors declined.

It is notable that in our exploratory models (see Section 3.3), when we control for additional variables (including having children in the household, economic activity, and neighbourhood social capital) the effects of marital status disappear. This suggests that they are largely explained by one or more of the suite of additional exploratory factors though it is not possible to pinpoint which factors are responsible from the current analysis.

Urban-rural classification

The models showed **significant effects of urban-rural classification[9] on use of the outdoors, however there were some differences between the 2014 and 2016 models**. In 2014 those in small towns (both accessible and remote) and in rural areas (both accessible and remote) were more likely to report using the outdoors as least once a week, compared to residents of Scotland's large urban areas. There was no significant difference between large urban areas and other urban areas. In 2016, significant differences only emerged for those living in remote small towns and in remote rural areas, as compared to large urban areas.

We might assume that the **general picture of lower outdoor recreation participation in urban areas than in (some) more rural and small town settings** relates to spatial differences in access to outdoor

[9] For definitions of the categories in the 6-fold urban-rural classification 2013 please see Appendix B.

recreation opportunities and natural settings. It is not self-evident, however, that rural residents always benefit from greater opportunity (Lachowycz & Jones, 2013). Although living in a rural area may mean being surrounded by greenery and undeveloped land, agricultural land may not be particularly accessible and nearby resources may not be walkable, either due to distance or a lack of pavements or footpaths to access them. One possible alternative interpretation relates to the extent to which people have access to a variety of leisure activities other than those we consider in terms of outdoor recreation. Urban residents have more access to leisure environments like shopping areas and centres, cinemas, eateries, museums and galleries etc. It is possible that, for some people in non-urban areas, greater use of the outdoors might be related not just to greater access but also to a more limited range of alternative leisure activities. This interpretation might also help to explain some of the differences between remote and accessible areas observed in the models.

Nevertheless, the models point towards an urban-rural disparity which suggests that residents in urban areas, and to some extent accessible areas, may be less likely to use the outdoors on a regular basis than those in more remote rural and small town areas and therefore are less likely to be accessing the health benefits of natural environments. This is concerning as urban dwellers may be amongst those most in need of restorative nature experiences due to the environmental stressors and information overload associated with urban environments. There is also some evidence that relationships between greenspace access or proximity and health are stronger in more urban areas, although such studies tend to be limited by problems of defining greenspace across urban and rural areas (Lachowycz & Jones, 2013).

Area deprivation

The main models showed **clear effects of area-level deprivation on use of the outdoors**. Compared to residents living in the 20% least deprived datazones (SIMD quintile 5), those living in each of the other SIMD quintiles were significantly less likely to report use of the outdoors on at least a weekly basis. As would be expected, the greatest disparity was between those in the most deprived areas (SIMD 1) and residents in the least deprived areas (SIMD 5).

Socio-economic inequalities in greenspace use and outdoor recreation are well documented (Boyd et al., 2018; Curry et al., 2001; Lee & Maheswaran, 2010). There are many possible reasons behind these disparities but there are three key reasons which we consider here: 1) inequalities in greenspace/resource provision; 2) negative perceptions of the local environment in general and greenspace more specifically; 3) economic barriers (e.g. relating to car ownership). Those living in the 20% most deprived areas are less likely to live within a 5 minute walk of local greenspace, and are less satisfied with the quality of their local greenspace than those in less deprived areas (Scottish Government, 2017b). They are also less likely to rate their neighbourhood as a good place to live, which also relates to perceptions of safety when walking alone (Scottish Government, 2017b). Furthermore, those in lower income households are less likely to be in possession of a driving licence (Transport Scotland, 2017), which might limit opportunities to access outdoor recreation opportunities further from home. In the exploratory models (Appendix C) we were able to control for a number of these and related variables (see Appendix B for full descriptions) and found that while this reduced the observed differences to some extent (particularly in 2016), inequalities in use of the outdoors by SIMD still persisted. This indicates that we need to look further than these

exploratory variables to fully understand the complexity of relationships between deprivation and outdoor recreation participation.

Promoting outdoor access in the most deprived areas and among lower income groups is an important policy goal, both in terms of securing environmental justice and achieving public health outcomes of reducing socio-economic inequalities in health. There is evidence that greater access to greenspace can ameliorate health inequalities in mortality and cardiovascular disease (Mitchell & Popham, 2008), and access to natural environments has been implicated as a mechanism to explain why some very deprived areas exhibit better population health outcomes than others (Cairns-Nagi & Bambra, 2013). The evidence to date for Scotland shows a more mixed picture, however. Results from the Scottish Government commissioned Green Health project reported that although socio-economic health inequalities are not significantly reduced in the greenest urban areas, greater greenspace is associated with lower mortality for Scotland's poorest men, and also that using greenspaces for physical activity (as opposed to other types of physical activity environment such as streets or sports centres) is associated with lower risk of poor mental health (Mitchell, 2013).

3.3 Additional factors influencing use of the outdoors

The exploratory models (Appendix C) further explored the extent to which other individual-level characteristics explain use of the outdoors (addressing RQ 3). A number of additional explanatory variables (see Appendix B for details) were included in the model as predictors of use of the outdoors on at least a weekly basis, whilst also controlling for the main model variables. Several of the additional variables were significantly associated with use of the outdoors, for both 2014 and 2016. These were:

- **Economic activity** – Compared to those in full-time employment, part-time workers were significantly more likely to use the outdoors on at least a weekly basis.
- **Education** – Those educated to degree-level (or equivalent) were significantly more likely to use the outdoors on at least a weekly basis.
- **Distance to greenspace** – Those with a local greenspace within a 5 minute walk from home were significantly more likely to use the outdoors on at least a weekly basis.
- **Neighbourhood satisfaction rating** – Compared to those who rated their neighbourhood as a 'very good' place to live, those whose satisfaction rating was lower (i.e. 'fairly good' to 'very poor') were significantly less likely to use the outdoors on at least a weekly basis.
- **Neighbourhood social capital** – Those whose social capital index score was below the national average (mean score) were significantly less likely to use the outdoors on at least a weekly basis.
- **Time living at address** – Those who had lived at their current address for less than 3 years were significantly more likely than others to use the outdoors on at least a weekly basis[10].
- **Walking for active travel** – Those reporting that they had not walked for travel purposes at any point during the past 7 days were also significantly less likely to report use of the outdoors for recreation on at least a weekly basis.

[10] This 'newcomer' effect was also tested using a cut-off threshold of one year at current address, however the 3 year threshold was found to be a stronger predictor of use of the outdoors.

The magnitude of the above effects were all broadly comparable.

Some factors showed mixed results when comparing the 2014 and 2016 models. In terms of **economic activity** – self-employed individuals were significantly more likely than full time workers to report weekly outdoor use in 2014 but not in 2016. In 2016, retired people and those whose main activity was caring for the home or family were more likely than full-time employed people to report weekly outdoor use, however this was not the case in 2014. **Carers** (providing unpaid care to adult family members, friends etc.) were more likely than non-carers to use the outdoors on a weekly basis in 2014 but not in 2016. Surprisingly, there was a relatively strong significant effect of **driving licence** possession in 2016 (with licence holders more likely to report weekly outdoor recreation) but no significant effect in 2014. There was also mixed evidence of effects of household composition. Whilst it could be expected that having **children in the household** (under 16s) might be associated with frequent use of the outdoors, this was found to be the case for 2016 only. Living in a **single adult household** (as opposed to living with at least one other adult, with or without children), which was expected to be more relevant to recreational activities than the more restricted marital/civil partnership status variable, was not associated with weekly outdoor use in either of the study years. In terms of the other variables related to neighbourhood characteristics (**satisfaction with local greenspace, feelings of belonging to the neighbourhood, feelings of safety**), no significant associations were found.

3.4 Study limitations and questions for further study

As with all secondary analyses, the scope of the analysis was limited to some extent by the data available. Information on some protected characteristics – pregnancy and maternity, and gender reassignment – is not collected as part of the SHS. It is also important to note that this study focused only on adults. Future research will be needed to identify population-scale patterns in outdoor recreation participation amongst children and young people under the age of 16.

The SHS collects detailed data on ethnic group membership. However, the analysis of disparities in participation between ethnic groups was limited due to the relatively small sub-sample sizes for a number of ethnic groups. This meant that it was necessary to combine the non-white ethnic groups into one (BME) category for the analysis to avoid the risk that the statistical model would not pick up important differences purely because of the small size of the ethnic group sub-samples. Qualitative research approaches offer significant opportunities for developing a more meaningful understanding of differences in behaviour and attitudes around outdoor recreation between (and within) ethnic groups in Scotland.

As noted previously (Section 3.1) the models were limited in their explanatory power, suggesting that much of the variation in use of the outdoors results from unobserved variables. Other potential influencers of outdoor participation were discussed briefly in Section 3.2. There may be opportunities to investigate how such factors influence outdoor recreation, and the extent to which they might help to explain inequalities between population subgroups, through the inclusion of new questions in future commissioned large scale social surveys on outdoor recreation and connections to nature. These quantitative approaches to investigating use of the outdoors can be complemented by qualitative research focusing on in-depth exploration of the attitudes, behaviours and

experiences of different groups of people in Scottish society to answer the 'how' and 'why' questions arising around inequalities in outdoor recreation participation.

It should also be noted that there are limitations associated with statistical models which include multiple hierarchical steps and a large number of independent (predictor) variables. The more independent variables included in a model, the greater the chance of Type 1 error occurring. This means that in the exploratory models in particular, given the large number of variables, there is a greater risk that a model will indicate a significant relationship where none actually exists. We have addressed this limitation to some extent by applying the model to two separate samples (2014 and 2016) and concentrating the discussion on the factors which were associated with use of the outdoors in both years.

Finally, it is important to note that there are limitations associated with quantitative techniques that examine participation in relation to membership of specific groups. The strength of the modelling approach used is that it allowed us to statistically control the effects of potential confounding variables and therefore isolate associations between population subgroup membership and the outcome behaviour. However, there are criticisms of this approach which argue that segmenting society into analytical categories can lead to essentialist ways of thinking that treat groups as homogeneous and overlook diversity and complexity within groups (see e.g. Agyeman, 2003). We must therefore be careful in our interpretation of the data that we do not fall into this trap due to a desire for headline explanations that account for lower participation by some groups. Related to this, there is an increasing body of literature influenced by feminist theory which highlights the importance of taking *intersectionality* and the multi-faceted nature of individual identities into account when considering environmental justice issues around outdoor access (Henderson & Gibson, 2013). In simplistic terms, *intersectionality* refers to the fact that we fall into multiple population groups and that those at the intersection of particular marginalised groups may experience inequalities that go above and beyond those associated with either of the groups on their own (Crenshaw, 1991). For example, Muslim women might experience specific outdoor access constraints beyond those that might be commonly associated with being Muslim or being female when considering these groups separately. These kinds of complex interactions are not represented in our statistical models.

4. Conclusions and recommendations

This report has presented the results of statistical models developed to investigate patterns in use of the outdoors and equality of outdoor access across population groups in Scotland. These models found statistically significant differences in use of the outdoors between groups defined according to protected characteristics under the Scottish Government's Equality Act 2010. These differences were independent of area-level factors and many were consistent across two non-consecutive years of the Scottish Household Survey. The analyses also show some consistent disparities in use of the outdoors according to urban-rural classification and Scottish Index of Multiple Deprivation. These findings provide equality evidence on use of the outdoors which may be useful to those carrying out Equality Impact Assessment (EqIA) as well as adding to the evidence base informing the delivery of policies to facilitate increased use of Scotland's outdoors.

The findings raise important questions about environmental justice in access to outdoor recreation and, consequently, social inclusion in relation to the wellbeing benefits associated with access to Our Natural Health Service[11]. In the discussion of the literature explaining disparities in use of the outdoors, reasons for lower participation by certain groups tend to fall into two categories: (a) those relating to barriers to outdoor access which apply disproportionately to particular population groups; and (b) those relating to individuals' preferences, motivations and values (which may be culturally mediated). In the case of (a), there is a clear argument that social exclusion is occurring for some population sub-groups. It is perhaps a more complex issue in the case of (b); if use of the outdoors for recreation is influenced more by individual preference, or an absence of motivation, can we say individuals are being excluded? On the one hand, people may simply prefer other activities and settings, however at the same time, preferences and motivations are not necessarily independent of structural factors that relate to the exclusion of certain groups. This issue remains unresolved and highlights that it is difficult to ascertain exclusion on the basis of evidence of differences in demand for or participation in outdoor recreation (Slee, 2002). Regardless of whether we consider a group to be actively excluded or not, there are good reasons to promote engagement in the outdoors to maximise the benefits we gain from Scotland's outdoors and ensure that these benefits are distributed fairly across the population.

Based on our findings from the statistical modelling we make the following recommendations:

1) Programmes promoting use of the outdoors should promote the inclusion of key target groups.

The key population subgroups found to be less likely to participate on a weekly basis were[12]:

- People with a disability
- Muslims
- Residents in Scotland's most deprived areas
- Black and other non-white minority ethnic groups
- People aged 76 and over

These groups might therefore be considered priority target groups for programmes promoting outdoor recreation. Those who have never been married, or are separated, divorced or widowed, also had a lower likelihood of weekly participation, however these groups may be less of a priority for outdoor recreation promotion as marital status may act a proxy for other influential factors (e.g. having a partner or companion to visit with). Those living in Scotland's urban areas (and to some extent, those in accessible small towns and accessible rural areas) as well as individuals who had been separated/divorced/widowed were also less likely to report weekly use of the outdoors, however the patterns of differences were somewhat inconsistent across the 2014 and 2016 model.

The academic literature highlights that the underlying reasons for lower participation by particular groups are often numerous and complex. Furthermore, the limited explanatory power of our statistical models suggests that to gain an in-depth understanding of the factors that shape use of the outdoors we must look much further than the factors considered in our analysis. Social

[11] https://www.nature.scot/professional-advice/contributing-healthier-scotland/our-natural-health-service
[12] Listed in order of size of the disparity in 2016 (i.e. odds ratio for each group in relation to their reference group in 2016 core model step 2).

marketing approaches targeting specific population groups may therefore be insufficient to deliver increased engagement with the outdoors if they do not also tap in to the complexities underlying group differences and the behaviour of individuals.

The targeting of key groups could take the form of interventions focused on a particular key group as the beneficiary. Alternatively, more general initiatives can take specific steps to maximise their inclusiveness with respect to the key groups mentioned. The appropriateness of each of these approaches for increasing use of the outdoors in key population groups may well depend on the group in question.

***2) The Scottish Government should continue to support population-scale research on outdoor recreation participation, its determinants and potential outcomes*.**

This study demonstrates that the data available in the SHS can provide useful insights into inequalities surrounding outdoor participation for protected groups and according to area deprivation and urban-rural classification. It has allowed us to go some way in understanding how additional individual-level factors can help to explain individuals' engagement in outdoor recreation. However, the relatively low explanatory power of the models suggests that we need to look at other factors beyond those for which we have SHS data in order to better understand outdoor engagement at the population scale. Topic-based social surveys like Scotland's People and Nature Survey (SPANS) offer significant opportunities for gathering population-scale data on key factors likely to influence use of the outdoors. Whilst the focus in this respect is often on cataloguing the barriers and motivations to outdoor access, there is much to be gained from gathering evidence on more psychological factors, for example on individuals' emotional connection to nature and local landscapes, identities with respect to the outdoors, and past (including childhood) nature experience. Whilst stand-alone surveys can offer useful snapshots into the current situation, the differences in the results of our 2014 and 2016 models point to the value of repeated population-scale surveys. Using data from a series of survey waves could, in the future, allow us to identify which patterns are consistent and entrenched, which fluctuate year-on-year, and importantly, which patterns indicate genuine progress in promoting the use of the outdoors in the general adult population and amongst particular subgroups in the Scottish population.

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Appendix A: Percentage of Scottish population using the outdoors at least once a week, by population group.

Group	% using the outdoors at least once a week	
	2014	2016
General population	48.4	48.5
Age		
Age 16-25	51.2	53.7
Age 26-35	52.5	51.1
Age 36-45	51.0	53.7
Age 46-55	52.7	47.7
Age 56-65	46.8	48.8
Age 66-75	42.6	45.1
Age 76+	34.1	33.4
Disability		
No disability	51.7	51.6
Disability	24.9	26.0
Sex		
Male	51.2	49.8
Female	45.8	47.3
Race/Ethnicity		
White ethnic groups	48.8	49.0
BME groups	36.5	35.1
Religion		
No religion	49.8	52.1
Christian	47.6	45.3
Muslim	28.1*	27.8*
Other	48.5*	39.5*
Sexual orientation		
Heterosexual	48.5	48.4
Lesbian/gay/bisexual/other	47.0*	57.0*
Marriage and civil partnership status		
Married	51.2	50.8
Never married	48.9	49.0
Separated/divorced/widowed	39.6	40.7
Urban-rural classification		
Large urban areas	44.8	47.5
Other urban areas	47.1	45.6
Accessible small towns	51.3	46.4
Remote small towns	56.1	58.1
Accessible rural areas	53.2	54.3
Remote rural areas	59.3	57.9
Area deprivation (SIMD quintile)		
SIMD 1 (most deprived)	40.0	38.9
SIMD 2	45.5	45.2
SIMD 3	47.8	49.3
SIMD 4	51.4	53.1
SIMD 5 (least deprived)	57.3	55.8

Data source: Scottish Household Survey 2014 and 2016. Percentages reported are population estimates using SHS standard weighting.

*Percentages indicated with an asterisk should be interpreted with caution due to small number of individuals in the sample for this group

Appendix B: Independent variables used in the analysis

Variable name	Description	% of 2014 sample[1]	% of 2016 sample[1]
Main model variables			
Age			
Age 16-25		15.8	15.3
Age 26-35		15.8	16.4
Age 36-45		15.9	14.7
Age 46-55		18.4	18.2
Age 56-65		15.0	15.3
Age 66-75		12.0	12.6
Age 76+		7.1	7.3
Disability			
Disability	Has a long-term physical or mental health condition or illness that substantially reduces ability to carry out day-to-day activities	12.2	12.1
Sex			
Male		48.0	48.1
Female		52.0	51.9
Race/Ethnicity			
White	White ethnic groups	96.8	96.1
BME	Black and other non-white minority ethnic groups	3.2	3.9
Religion			
No religion	No religion	47.3	51.3
Christian	Christian religion	50.0	45.5
Muslim	Muslim religion	1.4	1.4
Other	Other religions	1.3	1.6
Sexual orientation			
Heterosexual	Heterosexual/straight	99.0	98.4
LGBO	Lesbian/gay/bisexual/other	1.0	1.6
Marriage and civil partnership status			
Married	Currently married/registered in a same-sex civil partnership	46.8	47.3
Never married	Never been married/registered in a same-sex civil partnership	35.5	35.9
Separated/divorced/ widowed	Separated (but still legally married/in civil partnership), divorced or formerly in a civil partnership now legally dissolved, or widowed/surviving partner from a civil partnership	15.8	14.8
Urban-rural classification 2013-14 (6-fold)			
Large urban areas	Settlements of 125,000 people and over	39.4	35.2
Other urban areas	Settlements of 10,000 to 124,999 people	29.9	34.7
Accessible small towns	Settlements of 3,000 to 9,999 people, and within a 30 minute drive time of a settlement of 10,000 or more	8.8	9.4
Remote small towns	Settlements of 3,000 to 9,999 people, and with a drive time of over 30 minutes to a settlement of 10,000 or more	4.0	3.5
Accessible rural areas	Areas with a population of less than 3,000 people, and within a 30 minute drive time of a settlement of 10,000 or more	11.8	11.4
Remote rural areas	Areas with a population of less than 3,000 people, and with a drive time of over 30 minutes to a settlement of 10,000 or more	6.1	5.8
Area deprivation (SIMD quintile)			
SIMD 1	Lives in one of the 20% most deprived datazones in Scotland	20.1	19.3
SIMD 2		19.6	20.3
SIMD 3		20.1	20.9
SIMD 4		20.5	19.7
SIMD 5	Lives in one of the 20% least deprived datazones in Scotland	19.7	19.8

Additional exploratory variables (exploratory model)		% of 2014 sample[1]	% of 2016 sample[1]
Full time	Employed full time	38.0	37.5
Self employed	Self employed	5.5	6.3
Part time	Employed part time	10.9	10.0
Home/family care	Looking after the home or family	4.8	5.3
Retired	Permanently retired from work	23.8	24.8
Unemployed	Unemployed and looking for work	4.5	3.4
Education/training	At school, in further/higher education or in government work or training scheme	7.9	8.1
Sick/disabled	Permanently sick/disabled or unable to work due to short-term illness or injury	4.6	4.7
Green5min	Nearest public greenspace from home is 5 min walk or less[2]	69.5	66.1
Greendissat	Very/fairly dissatisfied with quality of nearest public greenspace	9.4	9.5
Neighsatlo	Rates neighbourhood as being less than a 'very good' place to live (i.e. 'fairly good'-'very poor')[3]	43.9	43.2
Commbello	Respondent reports feeling they belong to their neighbourhood 'not very' or 'not at all' strongly	22.1	22.0
Neighunsafe	Reports feeling 'a bit' or 'very' unsafe walking alone in their neighbourhood after dark	14.2	13.8
Soccaplo	Below average score on neighbourhood social capital index[4]	35.8	34.9
Degree	Holds first degree, higher degree, SVQ level 5 or equivalent	20.9	22.7
Licence	Holds a full driving licence	67.3	67.8
Carer	Provides regular (unpaid) help or support to family members, friends, neighbours or others because of either long-term physical/mental ill-health/disability or problems related to old age.	17.2	18.7
Children	Child/children under 16 present in the household	27.4	25.9
Oneadult	One adult household (with or without children present)	23.6	24.3
Newcomer3	Has lived at present address for less than 3 years	24.0	25.8
WalktravelN	Has not walked for travel purposes in past 7 days	27.5	26.0

[1] With weighting applied.

[2] Variable specified in line with National Indicator 'Improve access to local greenspace'.

[3] Variable specified in line with National Indicator 'Improve people's perceptions of their neighbourhood'.

[4] Social capital index score calculated as an average of ratings given on 3 questions asking about whether respondent feels they can rely on friends/relatives in the neighbourhood to help them when in need/ keep an eye on their home/give advice or support.

Appendix C: Exploratory models predicting likelihood of visiting the outdoors at least once a week

		2014 model	2016 model
		Odds ratio	*Odds ratio*
Main variables	*Age*		
	Age 16-25	n/s	1.492**
	Age 26-35	n/s	n/s
	Age 36-45	n/s	1.213*
	Age 46-55 (ref[1])	-	-
	Age 56-65	n/s	n/s
	Age 66-75	.675**	n/s
	Age 76+	.630**	.742*
	Disability		
	Disability	.579**	.636**
	Sex		
	Female	.831**	.902*
	Race/Ethnicity		
	White (ref)	-	-
	BME	n/s	.617**
	Religion		
	No religion (ref)	-	-
	Christian	n/s	.833**
	Muslim	.332**	.506**
	Other	n/s	.570**
	Sexual orientation		
	Heterosexual/straight (ref)	-	-
	LGBO	n/s	n/s
	Marriage and civil partnership status		
	Married (ref)	-	-
	Never married	n/s	n/s
	Separated/divorced/widowed	n/s	n/s
	Urban-rural classification		
	Large urban areas (ref)	-	-
	Other urban areas	n/s	n/s
	Accessible small towns	1.259*	n/s
	Remote small towns	1.826**	1.420**
	Accessible rural areas	n/s	n/s
	Remote rural areas	1.755**	1.385**
	Area deprivation (SIMD quintile)		
	SIMD 1	.703**	.848*
	SIMD 2	.830*	n/s
	SIMD 3	.678**	n/s
	SIMD 4	.787**	n/s
	SIMD 5 (ref – least deprived)	-	-
Additional exploratory variables	*Economic activity*		
	Full time (ref)	-	-
	Self employed	1.312*	n/s
	Part time	1.247*	1.209*
	Home/family care	n/s	1.353**
	Retired	n/s	1.282*
	Unemployed	n/s	n/s
	Education/training	n/s	n/s
	Sick/disabled	n/s	n/s
	Degree	1.201**	1.158*
	Licence	n/s	1.530**
	Carer	1.299**	n/s
	Children	n/s	1.161*

	Oneadult	n/s	n/s
	Green5min	1.191**	1.276**
	Greendissat	n/s	n/s
	Neighsatlo	.818**	.797**
	Commbello	n/s	n/s
	Neighunsafe	n/s	n/s
	Soccaplo	.826**	.871**
	Newcomer3	1.294**	1.146*
	WalktravelN	.760**	.697**
	N	6374	8005
	Pseudo R^2	.051-.068	.057-.077

NOTE: BME = Black and other non-white minority ethnic groups; SIMD = Scottish Index of Multiple Deprivation. **Statistically significant at 1% level; * Significant at 5% level.

[1] Ref = Reference category (not entered into the model). Odds ratios represent the comparison with the reference category which has a value of 1. Odds ratios >1 indicate a greater likelihood of using the outdoors at least once a week compared to the reference group, with odds ratios <1 indicating a lower likelihood.

[2] n/s = Not significant