

**An Analysis of Regional
Variations in Sports
Participation in Scotland**

Research Report no. 105

**Professor Fred Coalter
University of Stirling**

**Steve Dowers
University of Edinburgh**

August 2006

Published by:

sportscotland
Caledonia House
South Gyle
Edinburgh EH12 9DQ
tel: 0131 317 7200
www.sportscotland.org.uk

Further information:

Professor Fred Coalter
Chair of Sports Policy
University of Stirling
j.a.coalter@stir.ac.uk

Jon P Best
Senior Research Manager
sportscotland
jon.best@sportscotland.org.uk

ISBN: 978 1 85060 496 9

Foreword

sportscotland has been gathering sports participation data on a continuing basis since 1987 – the longest consistent survey of a population's participation in sport at least in the UK – which has resulted in valuable information at national level. For the first time in 2003/04 additional funding from the Scottish Executive allowed us to commission a boosted sample large enough to explore patterns at local authority level. A minimum sample of 640 adults was surveyed in each of the 32 local authority areas, including significantly larger samples in major population centres such as Glasgow.

This report brings together experts from the universities of Stirling (Professor Fred Coalter) and Edinburgh (Steve Dowers) to analyse and explore the policy implications of these data from the boosted Scottish Opinion Survey run by Tom Costley and colleagues from TNS (formerly System Three Scotland).

The previous lack of such area participation data has meant that targets for Sport 21, the national strategy for sport, were necessarily for Scotland as a whole – any area-based targets could only be determined by guesswork and would therefore be unusable.

Only now has it been possible to explore the area-based mix that together forms the national picture. 'Areas' have been defined in this report as local authorities. Other geographical definitions of areas can be used for analysis, provided they are large enough to contain an acceptable sample and can be defined by postcodes: for example, health boards, parliamentary constituencies, urban/rural, remote/accessible, more/less deprived. Local authorities, however, are the key political subdivisions of the country; have a statutory duty to make leisure provision for their populations; develop the strategies for sport and other leisure at local level; and, notwithstanding the importance of the voluntary and commercial sectors, are key providers of opportunities for sports participation.

It does not come as a surprise that there are differences between levels of participation in different areas. Levels of participation in sport – as in other leisure activities – vary according to socio-economic factors: for sport, age is particularly important, and gender, social class, relative deprivation, educational level, disability, and accessibility of provision among others are all significant. As local authority areas vary in the socio-economic composition of their populations, we would not have been surprised if these variations in the composition of local populations had explained their differences in levels of sports participation.

The thorough analysis by the authors has shown that there is no such neat explanation. They find the following:

- There are surprisingly wide variations in levels of participation. For example, sports participation rates in Moray are nearly twice those of Glasgow.

- The socio-economic factors that they could measure are insufficient to explain these differences. Even when a wide range of factors was allowed for, there were still significant differences in levels of participation among the populations of local authority areas.
- These factors include access to facilities. The evidence is that there is such a level of sports facility provision across Scotland that differences in provision among local authority areas do not explain the different levels of participation.
- The lowest levels of participation were found in a tight¹ grouping of six local authorities in west central Scotland that contain a third of the country's population.

What are the explanations for these differences – in particular for the low-participating population in the west? Currently we do not know. It seems implausible that such a tendency is about sport alone. Are there other factors that hold particular sway in this area? If there were, they might well not provide an explanation, but they could provide a context to suggest the issue is a broader one than sport alone.

Further work is needed to help describe any broader context, but whatever emerged is unlikely to change the overall thrust of the policy implications drawn by the authors. The implications for Scottish sport of these wide differences in levels of sports participation across the country can be summarised as:

- tailoring both national and local policies for facilitating and promoting sports participation to reflect the differences at local authority and (in the case of the group of lowest-participating populations) wider area levels;
- addressing the particularly low levels of women's participation levels within the lowest-participating areas; and
- seeking to identify what works in the higher-participation areas to determine any practices that may be transferable.

Jon P Best
 Senior Research Manager
sportscotland
 July 2006

¹ The map in Figure 1 shows this grouping. It is possible that the grouping is geographically tighter than shown, as the islands plus the more rural parts to the south of the highlighted area may have higher levels of participation that are more comparable with their adjacent rural local authority areas. However, sample sizes are insufficient to explore this hypothesis.

1 Introduction

When the four-year targets for Sport 21 – Scotland’s national strategy for sport – were set by the Sport 21 Forum there was debate as to the relative utility of national or area-based targets. It was not possible to reconcile this debate because of the lack of robust data. As a consequence the Scottish Executive provided funding for a large-scale survey of participation in 2003/04 to permit the exploration of this issue. This involved an expansion of the Scottish Opinion Survey to 25,711 adult (16+) respondents living in Scotland, with structured sample sizes to provide a minimum of 640 adults from each of the 32 local authority areas. The sample was also designed to increase information on participation by those living in area-based Social Inclusion Partnership (SIP) and Scottish Index of Multiple Deprivation (SIMD)² areas.

These data have illustrated substantial differences in the rates of participation between local authority areas. This report illustrates these differences and seeks to analyse potential explanations and their policy implications.

2 General Patterns of Participation

As would be expected, there is a broad continuum of area-based differences in levels of sports participation, although the difference between the highest and lowest local authority areas is substantial. For example, the highest participation rate for *All Sports*³ at least once a week⁴ (65%) is nearly twice that of the lowest (34%). Further, the highest rate of participation already exceeds the overarching key challenge in Sport 21 that, by 2020, 60 per cent of adult Scots will take part in sport at least once a week. A further nine local authority areas have effectively reached the target (assuming a positive interpretation of the 2% margin of error). However, ten authorities have participation rates of less than 50 per cent. Six of these, with 32 per cent of the Scottish population, have participation rates of 40 per cent or less.

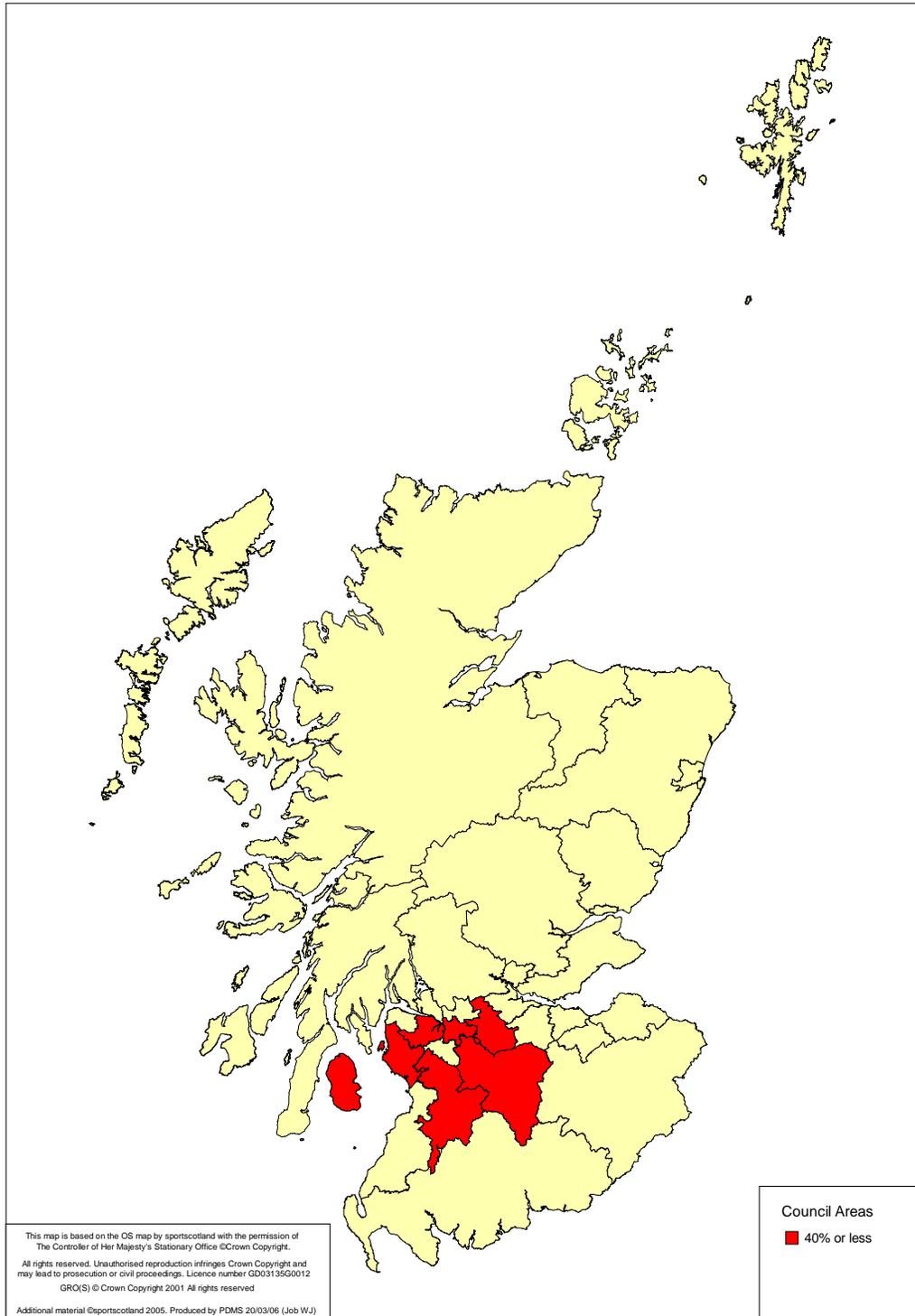
However, these differences are not evenly distributed throughout Scotland. The lowest participation areas are concentrated in the west of Scotland (Fig 1) – areas that have experienced the greatest decline in traditional manufacturing industry (ship-building, steel manufacture, coal mining, textiles and car production). Such concentrations raise important issues about policy and investment and also question the utility of national participation targets.

² Analyses are based on the 15% most deprived areas as defined in the Scottish Executive’s SIMD 2004 data. Further information: www.scotland.gov.uk/stats/simd2004/

³ ‘All Sports’ are defined as those sports and physical recreations recognised as sports for the purpose of investment and services by the national sports councils in the UK. They include most activities generally recognised as sports, excluding activities where humans are not the main active participant (eg, greyhound and pigeon racing). They include the popular physical recreations of walking (2+ miles), dancing and snooker/billiards/pool, but darts is not included here as it was not recognised until 2005.

⁴ The survey was undertaken each month throughout the year 2003/04 and asked about any sports participation during the four weeks prior to interview. “At least once a week” means that the respondents at taken part in sport four or more times over this period.

Figure 1: Local Authority Areas⁵ with 40% or Less Participation in *All sports at least once a week*



⁵ See the footnote (1) to **sportscotland's** Foreword that hypothesises that the actual geographical area of low participation may be more tightly defined. Note also that East Renfrewshire, an apparent 'island' of higher participation within the broader area of 40% rates or less, in fact has the next lowest rate of 45%.

However, in terms of policy and practice, we need to do more than simply illustrate such differences. Some exploration of the possible reasons for these differences is required (within the limitations imposed by the survey data). Further, taking into account local variations in key factors known to influence participation, we also need to investigate if various participation levels can be regarded as ‘under-’ or ‘over-performing’⁶. In other words, do the clear variations in rates of participation simply reflect local conditions?

In the next section we will provide a more detailed description of the inter-area differences in sports participation, before exploring possible explanations.

3 Sports Participation: the Extent of Variation Between Areas

3.1 Aggregate Participation by Area

Figure 2 illustrates the broad continuum of levels of sports participation, the substantial differences between the highest and the lowest levels and the geographic concentration of the lowest participation levels.

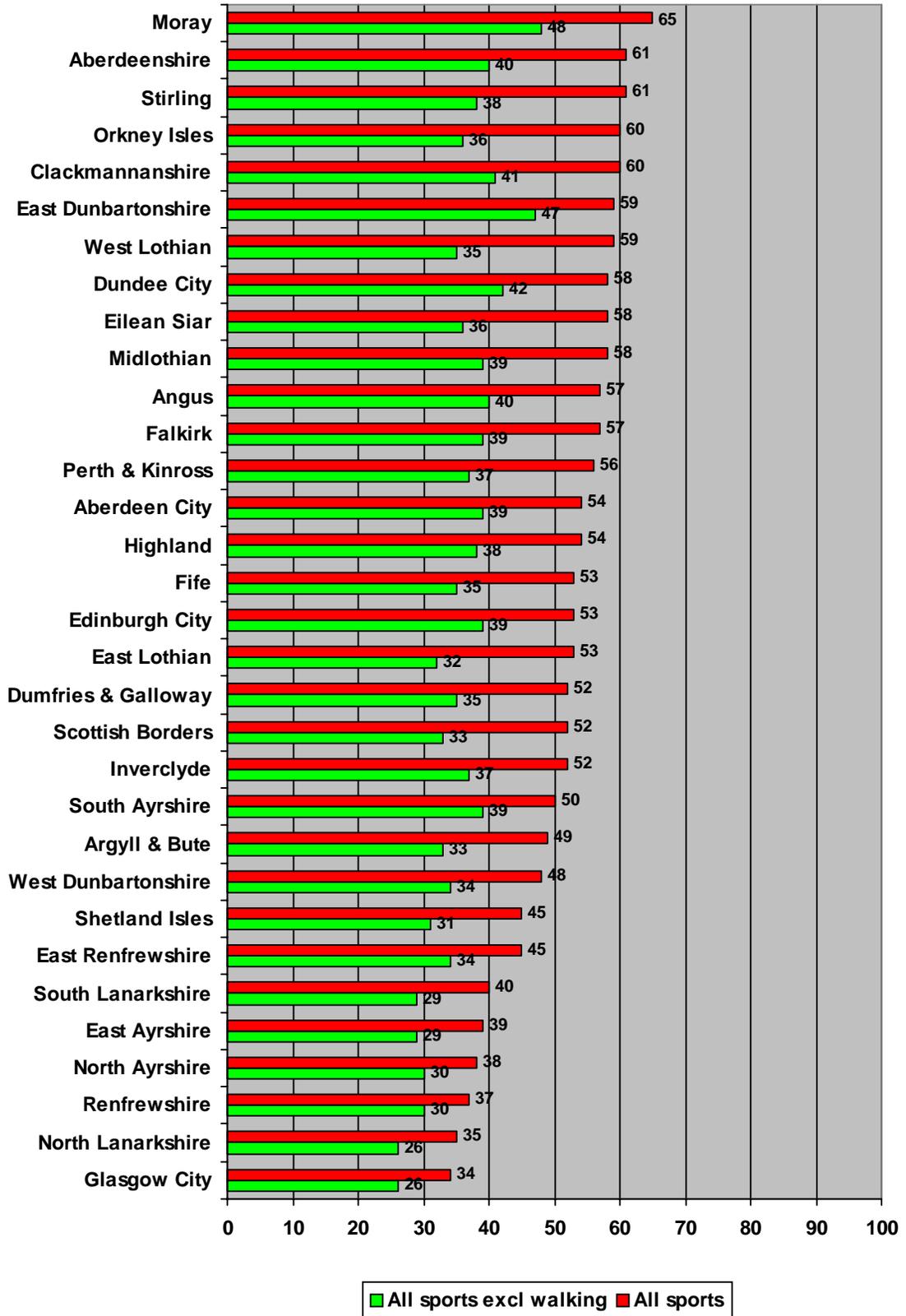
3.1.1 All Sports

Five local authority areas have already either met, or surpassed, the target of 60 per cent taking part in *All Sports at least once a week* by 2020 – Moray, Aberdeenshire, Stirling, Orkney Isles and Clackmannanshire. Allowing for a positive interpretation of the two per cent margin of error, another five could reasonably be included as having achieved the target (although in all cases they will need to at least maintain this level of participation to 2020). However, it is worth noting that two of this ‘top 10’ are not on mainland Scotland (Orkney Isles and Eilean Siar) and account for a small proportion of the total population of Scotland. Further, there is only one city in the top 10 – Dundee. In terms of cities, Aberdeen (54% of adults participating at least once a week) is in 14th place, with Edinburgh (53%) at 17th. Glasgow’s participation rate of 34 per cent is the lowest of all local authority areas and is only just over half of the area with the highest participation rates (Moray) and less than two-thirds of Dundee’s level.

However, although Glasgow has the lowest absolute participation rate (as we will see, this is consistently the case, irrespective of taking a range of socio-demographic factors into account), it is part of a group of six contiguous authorities with aggregate participation rates of 40 per cent or less (only about two-thirds of the target participation level): Glasgow, North and South Lanarkshire, Renfrewshire, North and East Ayrshire; while East Renfrewshire, geographically part of this grouping, only has a participation rate of 45%.

⁶ The terms ‘over-performing’ and ‘under-performing’ are descriptors, not qualitative judgements. They describe the situation where areas have higher or lower rates of participation than the national average even when a range of factors that influence participation have been taken into account for that area. This is discussed in Section 4.

**Figure 2: Participation at Least Once a Week:
(i) All Sports (ii) All Sports excluding Walking**



3.1.2 All Sports Excluding Walking⁷ (at least once a week)

Overall levels of participation in *All sports excluding walking* are inevitably consistently, and in some cases substantially, lower. Some areas do have **relatively** higher levels of participation on this measure – East Dunbartonshire, Dundee, South Ayrshire – although the differences are not significant. There are also areas where walking clearly accounts for a large proportion of overall participation – Orkney Isles, West Lothian, Stirling, Eilean Siar, East Lothian, Aberdeenshire and Clackmannanshire.

Nevertheless, the same broad continuum of differences is evident, with the same geographically contiguous areas in the west occupying the bottom positions – with an overall level of participation much lower than the rest of Scotland. For example, Glasgow and North Lanarkshire have the lowest level of participation in *All sports excluding walking* – at 26 per cent this is only just over half of the highest level of participation.

3.2 Male and Female Participation

3.2.1 All Sports

After age⁸, gender is the key factor influencing participation in sport and physical recreation and gender inequalities are a core concern of sports policy. In this regard, Figure 3 (which includes walking) indicates the limitations of an **aggregate** national participation target figure, which serves only to disguise a much more fundamental policy issue – women's participation levels are, in general, lower than men's.

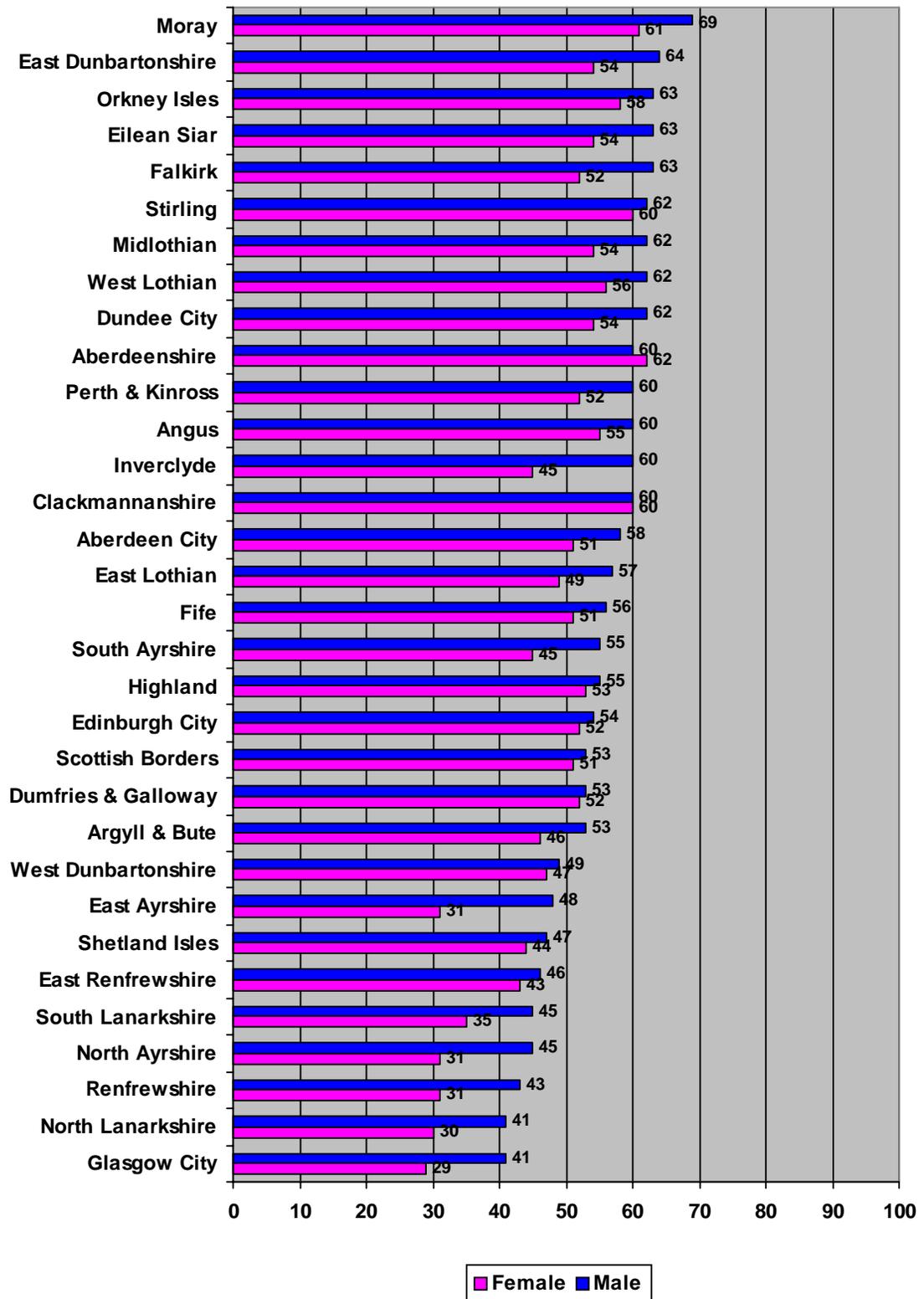
However, the picture is uneven. Taking into account the 2 per cent margin of error, female participation levels are broadly equivalent to males in Aberdeenshire, Clackmannanshire, Stirling, Highland, Edinburgh, Dumfries & Galloway and West Dunbartonshire. However, in other areas female participation is only about two-thirds that of males. Although the pattern is not wholly consistent, the greatest differences tend to be in the areas of generally low participation; ie, women are disadvantaged both absolutely and relatively.

In the four cities, Dundee (54%) has the highest absolute level of female participation, although Edinburgh has the highest rate of female participation relative to that of males – 96 per cent of that for males. Glasgow has both the lowest absolute female participation at 29% and the second lowest ratio of female/male participation at 70% (East Ayrshire has the lowest ratio at 63%).

⁷ Given the remit of **sportscotland** and the other UK sports councils for both sport and physical recreation, walking (2+ miles) is a component of the Sport 21 targets. However, this paper also provides a range of analyses excluding walking because particularly high levels of participation in this physical recreation may mask the broader picture of sports participation.

⁸ We did not analyse the impact of age as a separate category because the combination of 32 local authorities and six age categories would have meant some small sub-sample sizes, making meaningful interpretation difficult. However, age is one of the factors taken into account in the analysis provided in Section 4.

Figure 3: All Sports (at least once a week): Males and Females



3.2.2 All Sports excluding Walking (at least once a week)

However, when we turn to the more specifically sports category of *All sports excluding walking* (although this still includes the popular physical recreations of snooker/billiards/pool and dance), the picture changes substantially and gender differences are much clearer and more systematic.

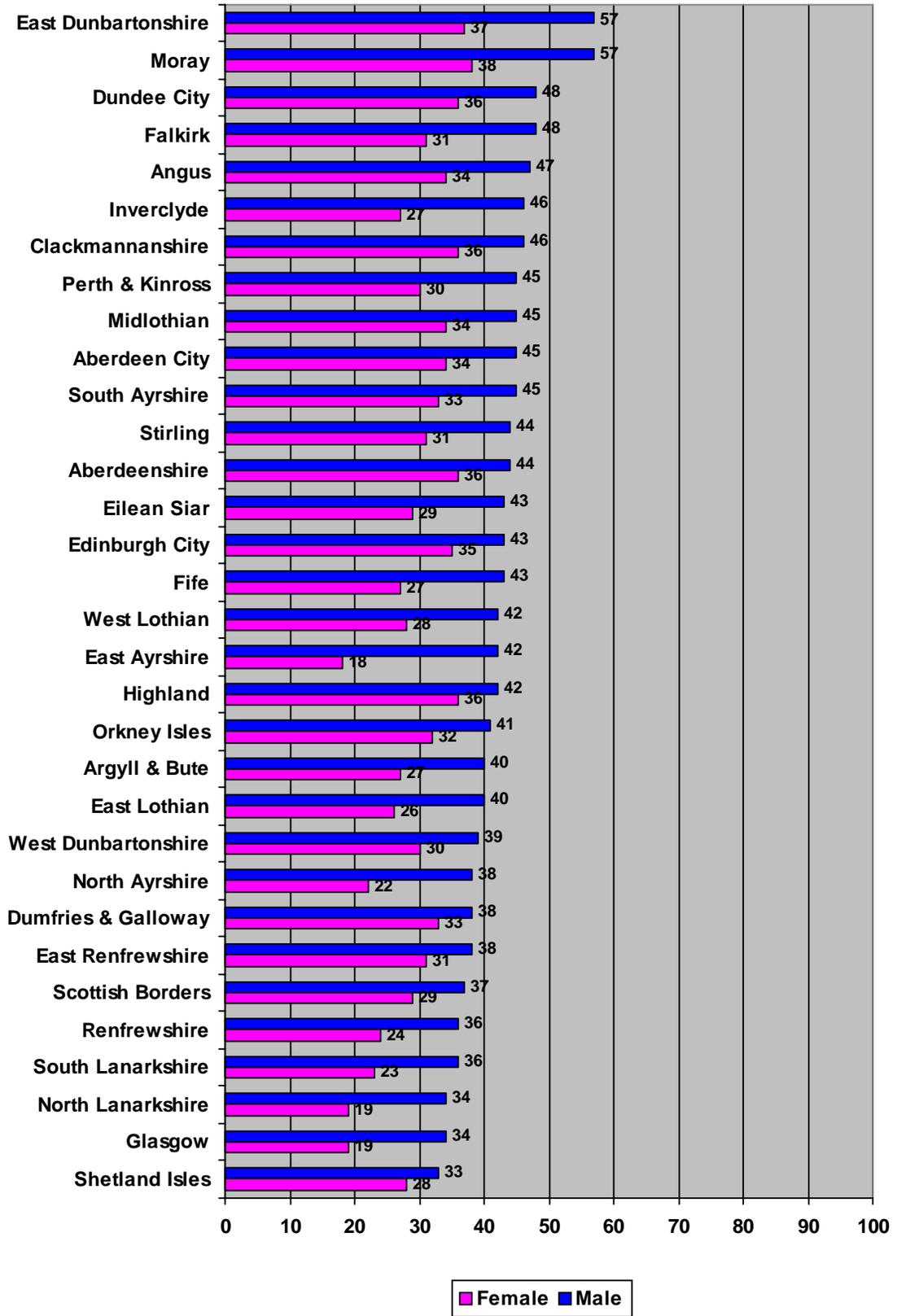
When walking is removed (Figure 4) not only is female participation substantially lower, but the disparities between men and women are substantially greater and evident in all areas. For example, in Aberdeenshire where female *All sports* participation is similar to that of males, female participation is now only 82 per cent of a much lower male level of participation. The areas with the highest level of female participation are Moray (38%), East Dunbartonshire (37%) and, at 36 per cent, Dundee, Clackmannanshire, Aberdeenshire and Highland.

The highest level of male participation is 57 per cent, in East Dunbartonshire and Moray – all other areas have participation rates of less than 50 per cent, with ten under 40 per cent. With the exception of the Shetland Isles and Scottish Borders, these lower participation areas are concentrated in the west.

Three of the cities have broadly similar female participation rates – Dundee (36%), Edinburgh (35%) and Aberdeen (34%). However, once again, Glasgow's female participation level of 19 per cent is substantially lower.

The lowest female participation rate is in East Ayrshire, with 18 per cent (only 43% of male participation). However, East Ayrshire is part of the contiguous group of west coast authorities with generally low levels of participation rates and much lower female levels – Glasgow, North and South Lanarkshire, North Ayrshire and Renfrewshire all record less than one quarter of their adult female population as participants. In Glasgow and North Lanarkshire the female level of participation is only just over half that of males.

Figure 4: All Sports excluding Walking: Participation at least once a week by Males and Females



3.3 Aggregate Levels of Participation: Interim Conclusions

The above data raise significant questions about the utility of national participation targets and national investment strategies. Firstly, the wide area-based differences in levels of participation, especially the clear geographic concentration of very low levels of participation, raise major questions about policy and investment – both the effectiveness of current investments and practice and the need for, and nature of, any additional or different types of policy and investment.

Further, although in some areas female participation rates in the *All sports* category are close to those of males, there are clear general and local issues of equity. More pragmatically, the desired 60 per cent participation target might be easier to achieve if the much lower levels of female participation were addressed in a coherent and targeted manner. In terms of the narrower category of *All sports excluding walking*, the male/female disparities are much greater and raise significant questions about sports development policies. However, overarching these gender issues are clear patterns of low participation **areas**: although there are systematic gender differences, where female participation levels are low, so is male participation.

However, it is difficult to draw precise policy conclusions about these differences, as they might reflect deep-rooted socio-cultural and economic differences between areas – crudely put; areas with a better-educated population with higher incomes and access to good quality facilities are more likely to have higher levels of participation than those without these factors. In such circumstances these differences in levels of participation are understandable and probably very difficult to address. These issues are explored in the next section.

4 Random or Structured Differences?

4.1 Introduction

Research indicates that a number of factors influence participation⁹: the age/sex structure of areas (the combination of these has been estimated to explain 70 per cent of the variance between participant/non-participant); the social class composition (with higher socio-economic groups more likely to participate); the related factor of education (with those staying on after the minimum school leaving age being most likely to participate); levels of car ownership; the supply and accessibility of facilities; the incidence of limiting long-term illness or disability; and general levels of deprivation (see Appendix B for an illustration of many of these relationships).

⁹ Coalter, F, Dowers, S, and Baxter, M (1995) The impact of social class and education on sports participation: some evidence from the General Household Survey. In: Roberts, K (ed) *Leisure and Social Stratification*. Leisure Studies Association, 1995.

Clearly these factors go some way to explaining the substantial inter-area differences in participation. However, perhaps a more significant policy issue is the extent to which such conditions **determine** levels of participation. Are the current levels of participation what might be expected, given the different nature of each area? This question is important in that it may illustrate the difficulties faced by certain authorities in seeking to overcome traditional and deep-rooted factors leading to low levels of participation. On the other hand, such conditions may simply be used as a rationalisation for 'under-performance'.

4.2 Calculating Estimated Participation

To explore this issue of 'under/over-performance' we undertook a logistic regression of participation (once a week or more) for each sport by the following variables, described in Appendix D:

- Age
- Sex
- Social grade (AB, C1, C2, DE)
- Terminal age of education
- Limiting long-term illness or disability
- Whether resident in an area in the worst 15 per cent of areas of multiple deprivation (Scottish Index of Multiple Deprivation)
- Car ownership
- Index of provision for sport

The analysis provided a parameter for each distinct value for each variable which was used in an equation to estimate participation for a particular sub-population (see Appendix C).

The estimated participation rate was calculated for each respondent in the survey and summarised together with observed participation and mean frequency for sports groups at local authority area level and for Scotland. Formulae were added to calculate the variation of the observed participation from the expected values (see Appendix C).

4.2.1 Difference

The variations were calculated as a difference (observed value – expected value), which allows such statements as 'local authority area X is 2 per cent above the expected participation'. The difference measure is an absolute one, where 2 per cent difference is much more significant for golf (where the participation rate is about 4%) than it is for *All sports excluding walking*.

4.2.2 Percentage

The variation of observed from expected participation was also expressed as a percentage score (observed/expected – 1)*100. This allows statements such as 'local authority area X has a participation rate 30 per cent higher than (ie, 1.3 times) the expected value'. This score is a relative measure, where 10

per cent variation has roughly the same significance for golf as it does for *All sports excluding walking*.

We have based this analysis on *All sports excluding walking* because this is the category which contains the activities which are most dependent on built facilities and we wish to control for issues of provision and accessibility (however, we acknowledge that this category also contains some activities which are not facility-dependent – see Appendix A).

In all figures in this section the mid point (0%) indicates the local authority areas with participation rates that are **in line with expectations** based on the above factors. Those authorities to the left of the mid point can be regarded as ‘under-performing’ in relation to expectations, with those on the right ‘over-performing’. However, all such calculations have associated margins of error and these are indicated by the thin line through each of the bars. Consequently, those bars that are within the margin of error can only be regarded as indicative, whereas where they extend beyond this line the performance can be considered to be ‘real’ (at the 95% confidence level).

4.3 Age and Sex: Variation from Predicted Levels of Participation

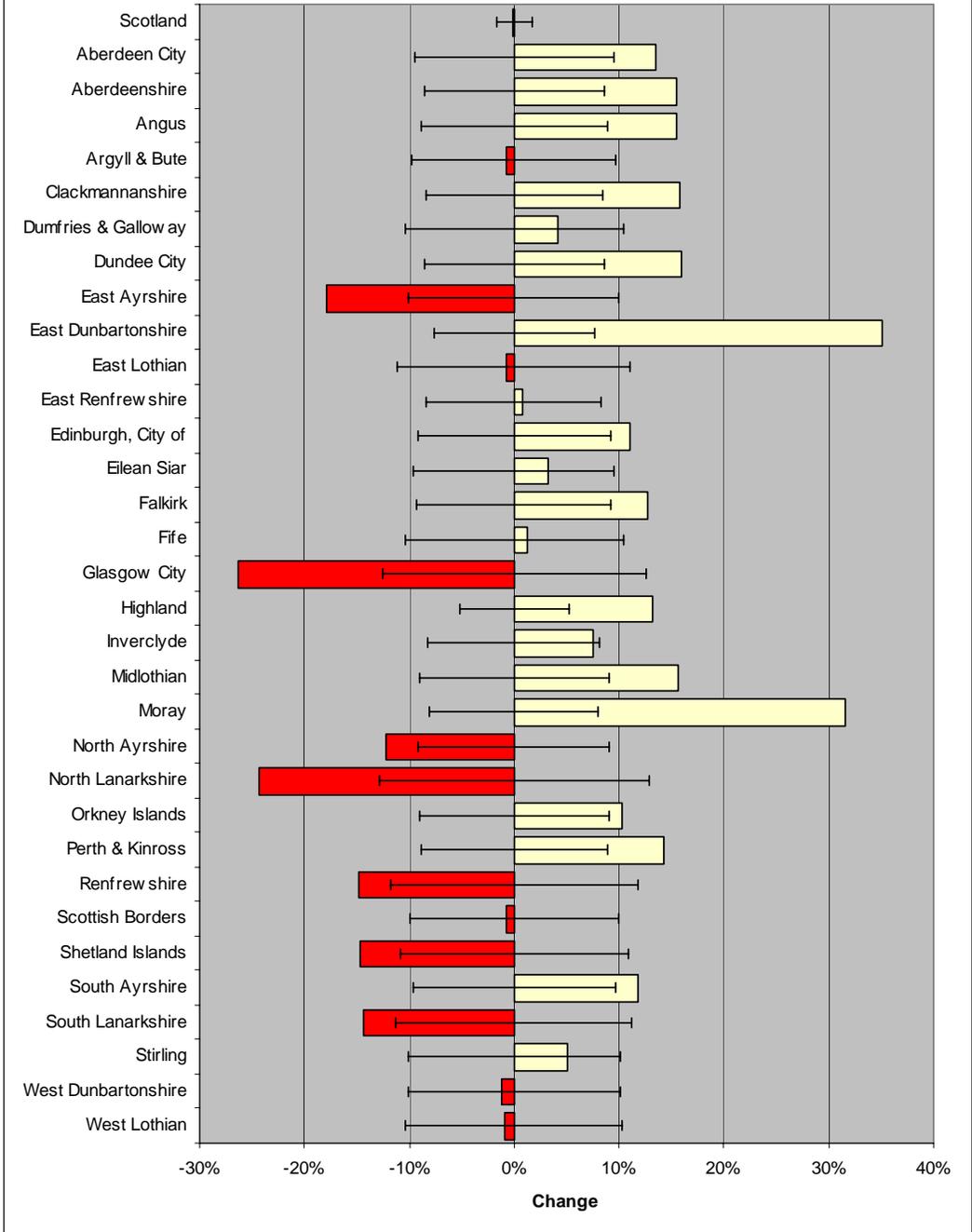
As already stated, the combination of age and sex provides the most robust single predictor of participation levels (accounting for up to 70% of the difference between participants and non-participants).

4.3.1 ‘Over-performing’ Areas

Figure 5 illustrates that, taking into account the relevant margins of error, 13 areas could be regarded as ‘over-performing’ in relation to the predicted outcome based on adult age/sex. The most clearly ‘over-performing’ areas are East Dunbartonshire and Moray – Moray has the highest overall participation, with East Dunbartonshire 2nd overall (see Figure 2). Moray’s participation rate is about 32 per cent more than would be predicted, with East Dunbartonshire about 35 per cent more.

It is interesting to note that of the populations of the ten councils who either meet or are within two per cent of the 60 per cent target figure, all but one could be regarded as ‘over-performing’.

Figure 5
Participation (1+ per week) in All less walking
variation from predicted by age and sex



4.3.2 'Under-performing' Areas

Interestingly, the local authority areas that can be regarded as 'under-performing' compared to predicted levels of participation are, except for the addition of the Shetland Isles, the same six west coast areas with the lowest overall levels of participation. These are South Lanarkshire, Renfrewshire and North Ayrshire; and East Ayrshire where the participation rate is 18 per cent less than would be predicted, North Lanarkshire (24 per cent less) and Glasgow (26 per cent less).

Of course, a range of factors other than age/sex influence participation and these are examined in the next section.

4.4 Controlling for Other Influences on Sports Participation

In addition to age and sex, Figure 6 presents data based on controlling for social class, terminal age of education, limiting long-term illness, if an area is in the worst 15 per cent of the Scottish Index of Multiple Deprivation, car ownership and sports facility provision – all factors likely to affect levels of participation.

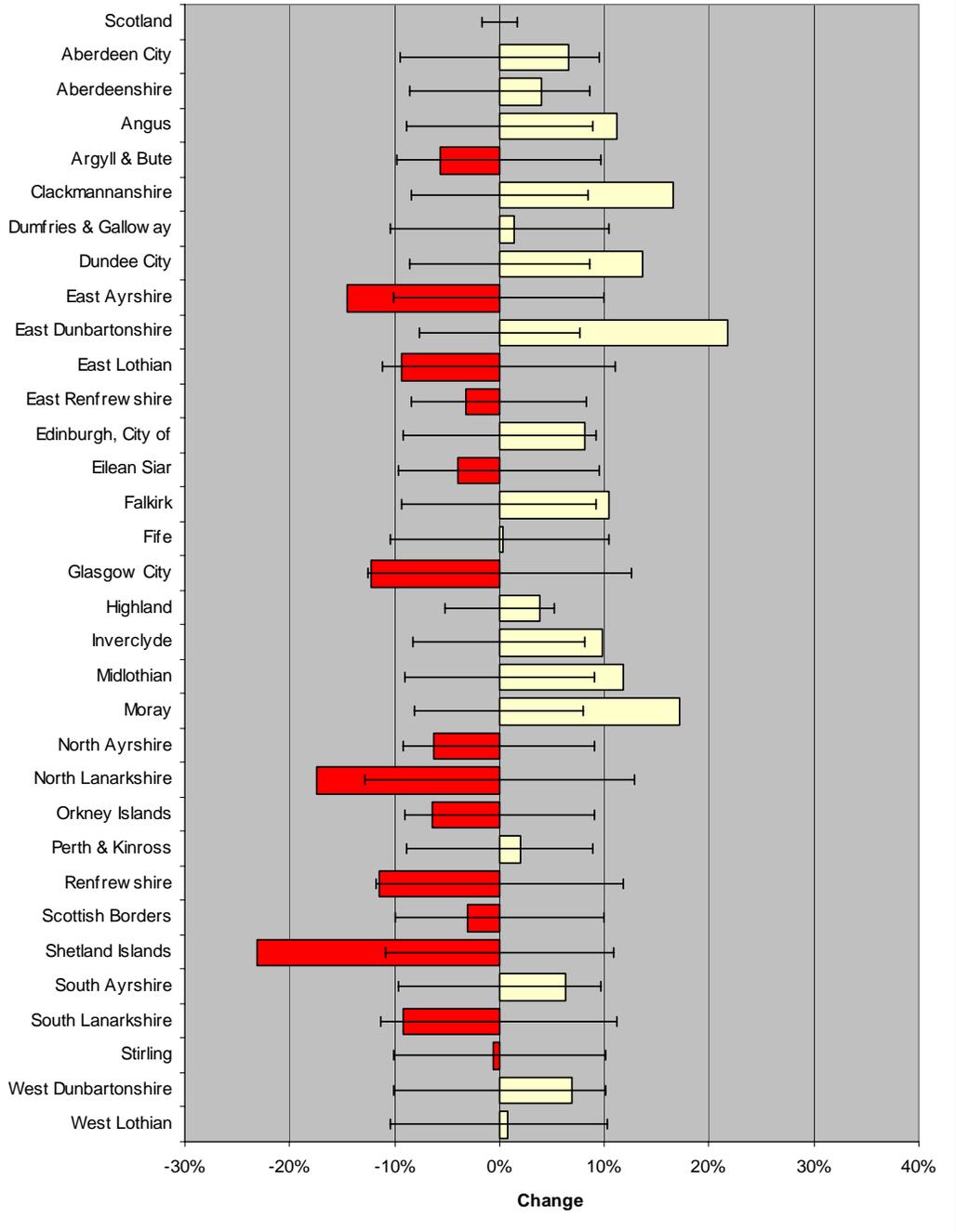
We analysed participation using the number of cars in the household as an indicator of access to facilities. We also estimated participation using a facility-provision factor that estimates the relative access to sports facilities. The addition of the facility provision factor added little **additional explanation** to the model and the difference between the estimates of participation using these two approaches is minimal and well within the margin of error. This indicates that the current level of facility provision in Scotland does not have a major influence on participation, **compared with other environmental, demographic and social factors**.

This is consistent with earlier analyses of the index of provision, in which there was no clear relationship between provision scores and the corresponding participation rates for local authority areas. For example, facility provision was not a significant factor in explaining different participation levels for: All sports, All sports less walking, Swimming, Indoor sports, Pitch sports, Other indoor sports and Other outdoor sports. Accordingly, we have only included Figure 6 – in which both car and facility provision are included as factors.

4.4.1 'Over-performing' Areas

Again the two most 'over-performing' areas are East Dunbartonshire (about 22 per cent above predicted participation levels) and Moray (+17%) – both substantially ahead of other 'over-performing' areas. There are four other areas which, statistically, can be regarded as 'over-performing': Clackmannanshire (+17%), Dundee (+14%), Midlothian (+12%) and Angus (+11%).

Figure 6
Participation (1+ per week) in All less walking
variation from predicted by age, sex, social, educ, llti, simd, car, provision



4.4.2 'Under-performing' Areas

Once again the 'under-performing' areas, taking into account a range of factors including social grade, deprivation and long-term illness/disability, are the same areas as previously. North Lanarkshire has a participation level 17 per cent below that predicted on the basis of the range of facilitating factors and East Ayrshire (-14.5%), Glasgow (-12%) and Renfrewshire (-12%) are 'under-performing' to a statistically significant extent. The greatest 'under-performer' is Shetland (-23%), but this is to be explained largely by an over-provision of facilities leading to expectations of higher participation levels that could not be met by the size of the local populations¹⁰. Of the cities, only Glasgow can be regarded as 'under-performing'.

It is also worth noting that, among the group of low participation populations of the west coast local authority areas, the levels in North Ayrshire and South Ayrshire indicate that they are 'under-performing' to a lesser extent than the contiguous authorities. Although all such measurements are subject to random variation arising from sampling and other effects, there are clear differences between these and several of the surrounding authorities.

4.5 Summary

There are clear and consistent differences between the local authority areas with the highest and lowest levels of participation and, irrespective of the factors controlled for, the same group of areas appear in the same categories. Most of the top local authority areas are effectively 'over-performing' in terms of predicted levels of participation, with most (although not all) of the low participation areas 'under-performing' – ie, given the combination of relevant local conditions, higher rates of participation could be expected.

This has important implications for the setting and achieving of national participation targets. If those who are already at or near such targets can be regarded as 'over-performing', then their ability to increase substantially such levels must be in doubt. This reinforces the importance of raising levels of participation in those areas just below the target or, more radically, addressing the issue of the substantial 'under-performance' of some areas. In order to seek a better understanding of these differences we examined the broad structure of participation in each area – are there different patterns of activity participation which might help us to understand better the measured differences and 'over-' and 'under-performance'?

¹⁰ Although we have previously asserted the **relative** lack of importance of the current facility provision in Scotland, Shetland is an exception because it has a very high value for its index of provision. This reflects a history of high investment based on income from the oil industry and the distribution of the population. Providing reasonable access to facilities led to facilities being built which will not be full, because each type of facility has a minimum practical size (eg, a hall used for team games needs to be large enough to contain four badminton courts irrespective of the number of people in the catchment area). The regression analysis uses a linear relationship between log-odds and index of provision and therefore the predicted value of participation for Shetland is much higher than other areas because of its extreme value for provision.

5 The Structure of Participation by Area

It is possible that some of the differences illustrated above might be explained by different combinations of sports undertaken in each area. Figure 7 is based on *All sports at least once a week* and illustrates the proportion of the population which takes part in each of the broad sports categories and their relative contribution to the overall level of participation in each area.

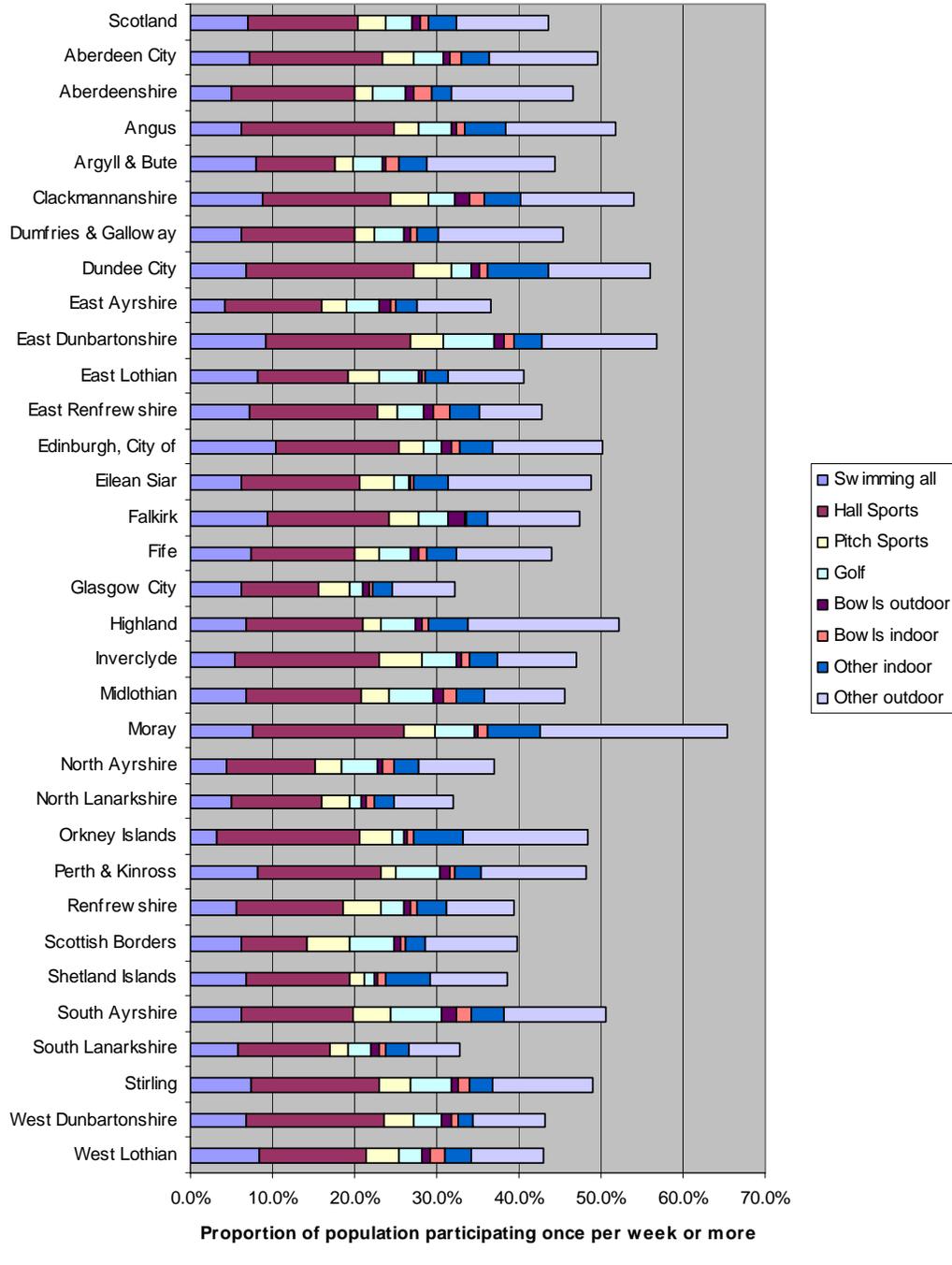
5.1 Other Outdoor Sports

This category includes a range of informal activities such as cycling, hill walking, angling, skiing and horse-riding, and excluding pitch sports (see Appendix A for the full list of activities). Figure 7 illustrates that Moray's position as the area with the highest level of participation is partly dependent on a high level of participation in *Other outdoor sports*. With nearly one-quarter of the population taking part in these activities at least once a week, this is twice the Scottish average (11%) and the highest proportion in all areas. Not surprisingly, the other areas with the next highest participation rates in *Other outdoor sports* are the rural areas of Highland (18%), Argyll & Bute (16%) and Eilean Siar (15%).

It is significant that in the areas with the lowest participation levels, much lower proportions of the population take part in *Other outdoor sports* – 7.5 per cent in Glasgow, 7 per cent in North Lanarkshire, 6 per cent in South Lanarkshire and 9 per cent in East Lanarkshire.

Although some of these activities require access to the countryside, the cities do not have uniformly lower rates of participation. Both Edinburgh (13%) and Aberdeen (13%) have similar levels, with Dundee close behind (12%). However, Glasgow's level of participation (7.5%) is substantially lower.

Figure 7
Participation once per week or more
Proportion of the population



5.2 Hall Sports

Of course, there are broader and consistent differences between the top and bottom performing areas. For example, Moray, as well as having the highest level of participation in *Other outdoor sports*, also has the third highest participation in *Hall sports*¹¹ (18%) – after Dundee (20%) and Angus (19%).

The areas with the lowest proportion of their population participating in *Hall sports* are, perhaps not surprisingly, the rural areas of Scottish Borders (8%) and Argyll & Bute (10%). However, once again the low participation areas in the west also have low levels of *Hall sports* participation – all below the national average (13.5%). Glasgow with 9.5 per cent has the second lowest level of *Hall sports* participation in Scotland. The rest of the group of six low-participation areas are as follows: North Lanarkshire (11%), Renfrewshire (13%), North Ayrshire (11%), East Ayrshire (12%) and South Lanarkshire (11%) (outside these west coast areas, East Lothian also has a participation level of 11%).

Among the cities, Dundee has the highest proportion of the population taking part in *Hall sports* (the second highest in Scotland). At 20 per cent, this is twice Glasgow's 9.5 per cent and more than Aberdeen (16%) and Edinburgh (15%).

5.3 Swimming

Although the differences between the top participating areas are small, it is interesting to note that only two of the top six – Clackmannanshire and East Dunbartonshire – are among the top performers in swimming. The highest proportions of the population swimming at least once a week are found in Edinburgh (10%), Falkirk (9%), East Dunbartonshire (9%), Clackmannanshire (9%), West Lothian (8%) and Perth & Kinross (8%).

Orkney (3%) has the lowest level of participation in swimming at least once a week. However, this is followed by two of the low participation west coast areas – East Ayrshire (4%) and North Ayrshire (4%). Among the low participation west coast authorities Glasgow (6%) has the highest proportion of the adult population swimming at least once a week. However, the three other cities have higher levels of participation: Edinburgh (10%), Aberdeen (7%) and Dundee (7%).

5.4 Cultures of Participation?

In general, the survey data indicate that there is no single activity, or even groups of activities, that explain area differences. Rather the data indicate a general 'culture' of either participation or non-participation – although the emphasis is slightly different in each of the top participating areas:

¹¹ The list of *Hall sports* is given in Appendix A.

- Moray has four groups of sports in the top quartile (hall sports, golf, other indoor sports, other outdoor sports).
- East Dunbartonshire has five in the top quartile (swimming, hall sports, golf, indoor bowls and other outdoor sports).
- Clackmannanshire has five (swimming, pitch sports¹², outdoor and indoor bowls and other indoor).
- Dundee, with the highest overall participation rates among the four local authority city areas, is slightly different with only three in the top quartile (all facility-based): hall sports, other indoor sports and pitch sports. Its ranking is achieved by having the top participation levels for both hall sports and other indoor sports (a combined total of 28 per cent of the population).

While Dundee can be regarded as distinctive among the high participation areas, with a very high level of participation in indoor sports, it still remains a broad fact that those areas that achieve high levels of participation do so across a range of sports.

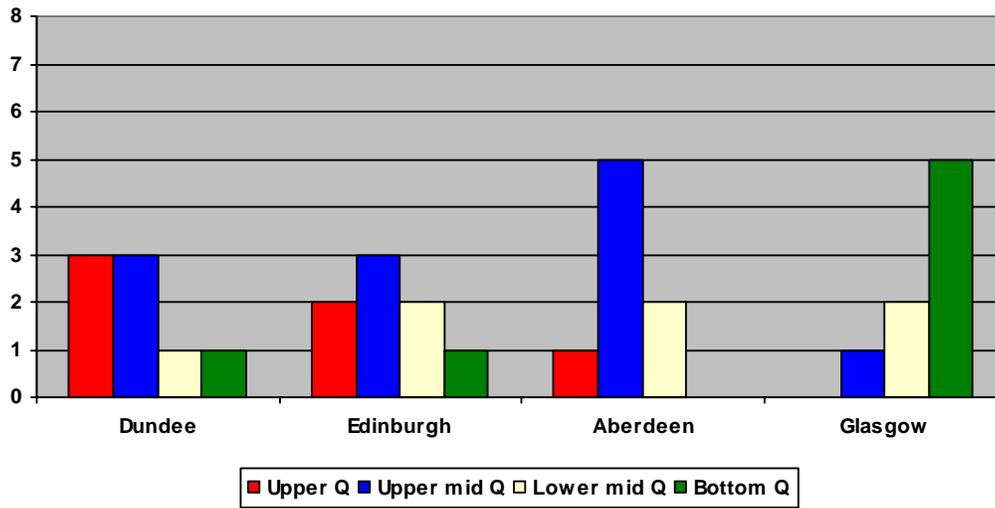
This pattern is emphasised when we look at the low participation areas:

- Glasgow has no group of sports in the top quartile and five in the bottom quartile (hall sports, golf, indoor bowls, other indoor, other outdoor sports).
- North Lanarkshire has no sports in the top quartile and six in the bottom quartile (swimming, hall sports, golf, outdoor bowls, other indoor, other outdoor).
- Renfrewshire has one sport in the upper quartile (pitch sports – ranked 5th overall) and four in the bottom quartile (swimming, golf, indoor bowls, other outdoor).
- North Ayrshire has one sport in the top quartile (indoor bowls), four in lower mid quartile (pitch sports, outdoor bowls, other indoor, other outdoor) and the two in the bottom quartile are sports with higher participation rates (swimming and hall sports).

Figure 8 illustrates the differences between the four local authority city areas, showing the number of the groups of sport – out of a total of eight groups – that they have in each of the four quartiles.

¹² The list of *Pitch sports* is given in Appendix A.

Figure 8: Cities: groups of sports in various quartiles



There are clear patterns. Dundee has only one sport in the bottom quartile (golf), but Glasgow has five (hall sports, golf, indoor bowls, other indoor sports, other outdoor). As already mentioned, the Dundee pattern is rather distinctive with only outdoor bowls and golf outside the top two quartiles and very high levels of participation in hall sports and other indoor sports. In the case of Glasgow, the highest performing category is pitch sports (in the second quartile).

Although there are area-specific characteristics – Dundee’s high level of participation in hall sports and other indoor sports and Moray’s in other outdoor sports – in general, the areas achieving high levels of participation achieve it in a number of categories. For example, four of the top five participation areas have hall sports in the top quartile; four (except Dundee) have other outdoor sports in the top quartile and four have other indoor sports in the top quartile. Conversely two of the bottom four performing areas have no sports groups in the top quartile and two have only one each.

Without denying particular local successes (such as Renfrewshire’s 5th spot for pitch sports) it seems clear that there exist what might be described as general ‘cultures’ of participation/under-participation. This suggestion is supported by the data presented in Section 4, which indicate that, when we control for a series of local factors known to influence participation, many (but not all) low participation areas can be regarded as ‘under-performers’ and high participation areas as ‘over-performers’.

6 Conclusions and Policy Implications

6.1 National or Area-based Targets?

The broad continuum of area-based differences in levels of sports participation, and the **substantial differences** between the highest and lowest, raise important questions about the relevance of national participation targets as the basis for the evaluation of performance – especially if such targets are taken as a proxy for the achievement of some degree of equity and a contribution to the more general physical activity and health agenda.

The survey data allow four broad groups of local authority areas to be distinguished, although it is acknowledged that these divisions are somewhat arbitrary (especially taking into account the issue of margins of error).

- (i) A group of ten local authority populations that already meet or, within the margin of error, exceed Sport 21's key challenge of 60 per cent of adult Scots taking part in sport at least once a week by 2020. Although there are some intra-group differences, all these authorities have a general 'culture of participation' – they all achieve high levels of participation in a number of categories. Further, many of these can be regarded as 'over-performing' and their main strategic aim may be simply to maintain such levels of participation, with a limited ability to achieve substantial increases.

| | | |
|---------------|---------------------|-------------|
| Moray | Clackmannanshire | Eilean Siar |
| Aberdeenshire | East Dunbartonshire | Midlothian |
| Stirling | West Lothian | |
| Orkney Isles | Dundee City | |

- (ii) A group of 11 'middling' authorities who are up to 8 per cent short of the current target, but could be regarded as capable of reaching it. It is interesting to note that the majority of these authorities can be regarded as marginally 'over-performing' compared with the Scottish average once the various socio-demographic factors described in Section 4.4 have been taken into account. In other words it is possible to assume that a bit more of the same might achieve more success.

| | | |
|-------------------|----------------|---------------------|
| Angus | Highland | Dumfries & Galloway |
| Falkirk | Fife | Scottish Borders |
| Perth and Kinross | Edinburgh City | Inverclyde |
| Aberdeen City | East Lothian | |

- (iii) The third group of five areas have participation levels around the 50 per cent mark. These are a rather mixed group, with some marginally 'over-performing' and some 'under-performing'.

| | |
|---------------------|-------------------|
| South Ayrshire | Shetland Isles |
| Argyll and Bute | East Renfrewshire |
| West Dunbartonshire | |

- (iv) The last group of six are distinctive, both for their much lower levels of participation (40% and below) and the fact that they are geographically contiguous in the west of Scotland. Although some can be regarded as achieving levels of participation which reflect a range of local circumstances, the majority can be regarded as ‘under-performing’. In other words, although the circumstances in these areas will strongly restrict the achievement of the highest levels of participation, more can be done to increase current levels. It could be argued that, unless the fundamental issues relating to this group of authorities are addressed, it is unlikely that any national target will be met (particularly as they contain a third of Scotland’s population) or, more importantly, the associated issues of equity and health addressed.

| | |
|-------------------|-------------------|
| South Lanarkshire | Renfrewshire |
| East Ayrshire | North Lanarkshire |
| North Ayrshire | Glasgow City |

The above, somewhat arbitrary, groups of authorities and the geographical concentration of very low levels of participation would suggest the need for both area-specific target monitoring and area-specific policies and investment.

6.2 Female Participation

Absolute and relative issues relating to gender are disguised by the use of national targets that are not differentiated by gender. The survey data illustrate the already recognised issue of women’s lower levels of sports participation (especially when walking is removed). However, they also illustrate significant regional variations and raise the possibility that the desired 60 per cent participation target might be easier to achieve if the much lower levels of female participation were addressed in a coherent and targeted manner.

Although female participation levels in the *All Sports* category are broadly equivalent to males in several high participation areas, in other areas they are only about two-thirds that of males. In terms of the narrower category of *All sports less walking*, the male/female disparities are much greater and raise significant questions about sports development policies. Further, the greatest differences tend to be in the areas of generally low participation; ie, women are disadvantaged in both absolute and relative terms. The fact that the lowest level of female participation (19%) is half that of the highest (38%) raises significant issues for policy and investment relating to 52 per cent of the Scottish population.

One possible way forward would be to undertake additional analyses of the dataset to explore the national and regional nature of broad-based gender differences and, more specifically, the nature of the area-based differences between females.

6.3 Facilities

Clearly no one would argue that built facilities are unimportant – without them there would be dramatically decreased opportunities to participate and for certain sports they are crucial. None of the above analyses diminishes the need to maintain and improve the range, quality and accessibility of sports facilities.

However, both this and other analyses indicate that, **relative to the importance of other environmental, demographic and social factors**, the current levels of facility provision in Scotland do not have a major influence on participation. In other words, after a certain level of supply is achieved, increased participation can best be achieved via systematic attempts to address demand-side issues and ‘cultures of non-participation’ – sports development is more important than facility development.

6.4 Best Practice

The survey data indicate both substantial differences in participation levels between often broadly similar authorities and several authorities that could be regarded as ‘over-performing’ on the basis of their **environmental, demographic and social** conditions. In order to understand better the factors which lead to both ‘over-’ and ‘under-performance’ it would be useful to undertake some comparative case studies to get beneath the survey data – what policies and investments have proven to most effective in increasing participation and what are the nature of the differences, if any, between different types of local authority areas?

APPENDIX A: SPORTS GROUPINGS

Hall Sports:

Badminton
Basketball
Dancing
Football (5-a-side indoor)
Gymnastics
Judo
Keep fit/Aerobics
Martial arts
Multigym use/Weight training
Netball
Table tennis
Volleyball
Yoga

Other Indoor Sports:

Climbing indoor
Curling
Ice skating
Snooker/Billiards/Pool
Squash
Tenpin bowling
Tennis indoor

Pitch Sports:

Cricket
Football (11-a-side)
Football (5-a-side outdoor)
Hockey
Rugby
Shinty

Other Outdoor Sports:

Athletics
Canoeing/Kayaking
Climbing outdoor
Cycling on the road
Cycling on a cycle path (eg, canal towpath, National Cycle Network)
Cycling: mountain biking/off-road on a purpose-built track or facility
Cycling: mountain biking/off-road elsewhere
Cycling: BMX at a purpose-built facility
Cycling: BMX elsewhere
Cycling at a velodrome
Angling
Football in street/garden/wasteland
Hillwalking
Horse riding
Running/Jogging
Sailing/Windsurfing
Skateboarding/Inline skating
Skiing/Snowboarding
Subaqua
Surfing/Bodyboarding
Tennis outdoor
Waterskiing

APPENDIX B: PARTICIPATION IN ALL SPORTS EXCLUDING WALKING BY KEY SOCIO-DEMOGRAPHICS

Participation in All less walking

| | | Male | | | | | | | Female | | | | | | | All | | | | | | |
|--|------------------|---------|---------|---------|---------|---------|-------|-------|---------|---------|---------|---------|---------|-------|-------|---------|---------|---------|---------|---------|-------|-------|
| | | 16 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | 65+ | Total | 16 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | 65+ | Total | 16 - 24 | 25 - 34 | 35 - 44 | 45 - 54 | 55 - 64 | 65+ | Total |
| Social Grade of Chief Income Earner | AB | 86.1% | 80.4% | 76.8% | 68.2% | 60.8% | 41.7% | 66.6% | 71.7% | 63.3% | 66.7% | 56.1% | 48.6% | 29.6% | 56.4% | 79.7% | 70.3% | 71.4% | 62.0% | 55.3% | 36.9% | 61.6% |
| | C1 | 78.2% | 76.0% | 68.6% | 53.7% | 42.7% | 32.4% | 60.8% | 67.2% | 55.9% | 49.6% | 41.7% | 37.1% | 23.0% | 46.4% | 73.5% | 65.1% | 58.4% | 47.7% | 39.9% | 27.5% | 53.4% |
| | C2 | 84.3% | 67.0% | 61.6% | 44.7% | 36.4% | 27.2% | 53.9% | 53.5% | 53.6% | 45.5% | 34.4% | 27.1% | 21.0% | 40.5% | 71.7% | 60.1% | 53.7% | 39.6% | 31.7% | 24.8% | 47.6% |
| | DE | 70.8% | 60.5% | 46.9% | 36.3% | 24.9% | 19.7% | 41.1% | 49.0% | 42.0% | 32.0% | 23.4% | 16.9% | 11.9% | 27.9% | 58.5% | 48.7% | 38.3% | 28.8% | 20.5% | 15.1% | 33.4% |
| | Total | 78.7% | 70.8% | 63.7% | 51.4% | 40.2% | 29.2% | 55.1% | 58.0% | 52.6% | 47.8% | 38.6% | 30.0% | 18.4% | 40.8% | 68.9% | 60.4% | 55.2% | 44.7% | 35.0% | 23.8% | 47.7% |
| Scottish Index of Multiple Deprivation | SIMD area | 70.8% | 57.4% | 49.4% | 36.8% | 27.0% | 15.3% | 44.1% | 43.0% | 37.4% | 23.2% | 22.4% | 15.8% | 11.8% | 26.7% | 55.7% | 45.8% | 35.5% | 29.0% | 21.0% | 13.4% | 34.6% |
| | Not SIMD area | 80.2% | 74.1% | 66.7% | 54.1% | 41.9% | 31.8% | 57.3% | 62.7% | 56.3% | 52.9% | 41.4% | 32.4% | 19.6% | 43.8% | 72.2% | 64.0% | 59.3% | 47.4% | 37.1% | 25.8% | 50.3% |
| | Total | 78.5% | 71.1% | 63.8% | 51.7% | 39.7% | 29.5% | 55.2% | 58.1% | 52.8% | 48.0% | 38.6% | 29.9% | 18.4% | 40.8% | 68.9% | 60.6% | 55.3% | 44.8% | 34.7% | 23.9% | 47.7% |
| Limiting Long-term Illness | LLTI | 58.6% | 59.1% | 37.8% | 35.4% | 26.0% | 17.3% | 28.8% | 54.5% | 45.5% | 36.1% | 25.7% | 20.9% | 9.4% | 22.5% | 56.6% | 50.8% | 36.8% | 29.9% | 23.5% | 13.2% | 25.5% |
| | No LLTI | 80.2% | 71.8% | 67.0% | 55.3% | 48.4% | 38.5% | 62.3% | 58.2% | 53.3% | 49.7% | 42.5% | 34.4% | 26.7% | 46.0% | 69.8% | 61.4% | 57.9% | 48.8% | 41.0% | 32.8% | 53.9% |
| | Total | 78.7% | 70.8% | 63.7% | 51.4% | 40.2% | 29.2% | 55.1% | 58.0% | 52.6% | 47.8% | 38.6% | 30.0% | 18.4% | 40.8% | 68.9% | 60.4% | 55.2% | 44.7% | 35.0% | 23.8% | 47.7% |
| Age Finished Formal Education | Still continuing | 83.8% | 84.6% | 67.7% | 87.9% | 41.3% | 75.4% | 83.1% | 68.3% | 60.8% | 56.6% | 42.2% | 20.2% | 95.3% | 65.5% | 76.5% | 69.8% | 61.5% | 58.8% | 24.0% | 80.6% | 74.4% |
| | 14 and under | 47.1% | 17.8% | 60.0% | 26.2% | 28.1% | 23.4% | 24.2% | 17.3% | 33.1% | 59.7% | 45.4% | 25.8% | 11.5% | 14.4% | 28.1% | 24.5% | 59.8% | 35.0% | 26.8% | 17.7% | 19.5% |
| | 15 | 75.2% | 69.3% | 47.7% | 40.6% | 33.4% | 28.2% | 38.2% | 47.9% | 42.4% | 36.3% | 28.9% | 23.4% | 18.7% | 26.4% | 61.7% | 54.1% | 41.6% | 34.0% | 28.1% | 23.2% | 31.9% |
| | 16 | 76.3% | 65.1% | 60.9% | 51.5% | 33.5% | 37.2% | 58.9% | 43.3% | 45.5% | 36.5% | 32.3% | 29.0% | 22.7% | 37.0% | 61.2% | 54.2% | 48.0% | 41.6% | 31.0% | 28.9% | 47.3% |
| | 17-18 | 76.2% | 74.5% | 68.1% | 53.2% | 54.8% | 38.7% | 64.8% | 61.6% | 54.0% | 56.1% | 45.4% | 45.4% | 25.5% | 51.6% | 69.5% | 61.9% | 61.2% | 49.3% | 50.6% | 32.1% | 57.7% |
| | 19+ | 83.1% | 78.9% | 71.1% | 65.4% | 57.6% | 35.6% | 66.4% | 73.6% | 66.8% | 69.9% | 59.9% | 51.5% | 30.4% | 61.8% | 78.4% | 72.4% | 70.5% | 62.7% | 55.1% | 33.4% | 64.2% |
| | Total | 78.7% | 70.8% | 63.7% | 51.4% | 40.2% | 29.2% | 55.1% | 58.0% | 52.6% | 47.8% | 38.6% | 30.0% | 18.4% | 40.8% | 68.9% | 60.4% | 55.2% | 44.7% | 35.0% | 23.8% | 47.7% |
| No. of Cars in Household | None | 68.8% | 56.9% | 42.3% | 32.9% | 21.9% | 12.7% | 37.9% | 50.8% | 42.0% | 25.9% | 19.3% | 15.0% | 11.1% | 25.8% | 58.9% | 47.5% | 32.4% | 25.0% | 17.9% | 11.7% | 30.6% |
| | One | 80.7% | 70.1% | 62.9% | 48.4% | 39.9% | 34.3% | 54.1% | 60.7% | 52.8% | 49.3% | 40.6% | 32.6% | 25.9% | 43.5% | 71.3% | 60.4% | 55.7% | 44.4% | 36.1% | 30.9% | 48.8% |
| | Two+ | 85.3% | 80.9% | 74.1% | 62.7% | 53.7% | 50.7% | 70.2% | 66.0% | 62.2% | 59.2% | 46.5% | 43.2% | 40.6% | 54.7% | 78.0% | 70.9% | 66.5% | 54.4% | 49.2% | 47.5% | 62.8% |
| | Total | 78.7% | 70.8% | 63.7% | 51.4% | 40.2% | 29.2% | 55.1% | 58.0% | 52.6% | 47.8% | 38.6% | 30.0% | 18.4% | 40.8% | 68.9% | 60.4% | 55.2% | 44.7% | 35.0% | 23.8% | 47.7% |

APPENDIX C: CALCULATING VARIABLES

The regression was performed with different groups of variables as follows:

1. AGE, GENDER
2. AGE, GENDER and AGE x GENDER (interaction term)
3. AGE, GENDER, AGE x GENDER, SOCIAL, EDUC, LLTI, SIMD
4. AGE, GENDER, AGE x GENDER, SOCIAL, EDUC, LLTI, SIMD, CAR
5. AGE, GENDER, AGE x GENDER, SOCIAL, EDUC, LLTI, SIMD, INDEX
6. AGE, GENDER, AGE x GENDER, SOCIAL, EDUC, LLTI, SIMD, CAR, INDEX

The SPSS procedure LOGISTIC REGRESSION was used for steps 1 to 4 since the variables involved are all of nominal scale. The variable INDEX is a continuous value, so the SPSS procedure NOMREG was also used for all 6 steps. The parameters estimated for steps 1 to 4 were identical for each procedure.

The analysis provided parameter for each distinct value for each variable which may be used in an equation to estimate participation for a particular sub-population. Since logistic regression is based on the log of the odds ratio of participation, the estimated participation involves applying the exp function and converting from the odds ratio. An example of the code to perform this for one set of parameter values is:

1. RECODE ZAGE (1=2.296176)(2=1.570406)(3=1.300943)(4=1.059395)
(5=0.683634)(6=0.410915)(ELSE=0) INTO ZAGEF .
2. RECODE ZSEX (1=0.604739)(ELSE=0) INTO ZSEXF .
3. COMPUTE ex22_74 = exp(ZAGEF+ZSEXF-1.838628) .
4. COMPUTE ex22_74 = ex22_74/(1.0 + ex22_74)*100 .

Step 1 derives the age parameter from the age group of the respondent.

Step 2 derives the gender parameter.

Step 3 calculates the odds ratio using the age and gender parameters together with the constant parameter (-1.838628).

Step 4 converts the odds ratio to the expected percentage participation.

The estimated participation rate was calculated for each respondent in the survey using sets of parameters from steps 1, 3, 4 and 6 above and summarised together with observed participation and mean frequency for sports groups at council level and for Scotland. The SPSS output was exported to Excel spreadsheet format where formulae were added to calculate the variation of the observed participation from the expected values. The variations were calculated both as a difference (observed – expected) and as a percentage score (observed / expected – 1) * 100. The former of these allows one to say that local authority area x is 2% above the expected participation while the latter allows one to say that area x has a participation rate 30% higher; ie 1.3 times the expected value. The difference measure is an absolute one where 2% difference is much more significant for golf (where the participation rate is about 4%) than it is for all sports. The percentage score is a relative measure where 10% variation has roughly the same significance for golf as it does for all sports.

APPENDIX D: DEFINITIONS OF VARIABLES

Age

This report relates to participation by adults (aged 16 and over); the sample sizes for children (8-15) are too small to allow for analysis by local authority area. The standard age groups used are 16-24, 25-34, 35-44, 45-54, 55-64, 65+.

Social Grade

The Market Research Society gives the following definitions of occupation groups (<http://www.mrs.org.uk/publications/downloads/occgroups5.pdf>):

AB: *Approximately 23% of the UK population.* Professional people, very senior managers in business or commerce or top-level civil servants. Middle management executives in large organisations, with appropriate qualifications. Principal officers in local government and civil service. Top management or owners of small business concerns, educational and service establishments. Retired people, previously grade A or B, and their widows.

C1: *Approximately 28% of the UK population.* Junior management, owners of small establishments, and all others in non-manual positions. Jobs in this group have very varied responsibilities and educational requirements. Retired people, previously grade C1, and their widows.

C2: *Approximately 21% of the total population.* All skilled manual workers, and those manual workers with responsibility for other people. Retired people, previously grade C2, with pensions from their job. Widows, if receiving pensions from their late husband's job.

DE: *Approximately 28% of the UK population.* All semi-skilled and unskilled manual workers, and apprentices and trainees to skilled workers; retired people in these categories and their widows if receiving pensions from their job. All those entirely dependent on the state long term, through sickness, unemployment, old age or other reasons. Those unemployed for a period exceeding six months (otherwise classify on previous occupation). Casual workers and those without a regular income. *[As with the other grades, those with job pensions and their widows (sic) are included in grade D according to the nature of their former employment. However, grade E includes all those who are solely dependent on the state pension and related benefits. This means that DE has a higher proportion of older people than the other grades, and accordingly age may be one factor that explains lower sports participation rates in this grade. As Appendix B makes clear, however, it is certainly not the only factor as those in grade DE have substantially lower participation rates than those in the other grades in every age group.]*

Terminal Age of Education

The standard categories used here are: still continuing, 14 and under, 15, 16, 17-18, 19+. As the compulsory school-leaving age was raised from 14 to 15 in 1947 and to 16 in 1972, participation rates for those reporting their school-leaving age as under 16 are likely to be more strongly influenced by age than by educational attainment issues.

Limiting Long-term Illness or Disability (LLTI)

The survey uses the standard Census question: *Do you have any long-term illness, health problem or disability which limits your daily activities or the work you can do?*

Scottish Index of Multiple Deprivation (SIMD)

The analysis uses the Scottish Executive's 2004 version of SIMD, which allows survey respondents' postcodes to be allocated to 'data zones' averaging about 800 residents. These data zones are ranked according to a range of 'domains':

Current Income domain - indirect measure of a major part of the main cause of deprivation.

Employment domain - direct measure of exclusion from the world of work.

Housing domain - direct measure of material living standards.

Health domain - indirect measure of both causes and consequences of deprivation.

Education, Skills and Training domain - indirect measure of both causes and consequences of deprivation.

Geographic Access and Telecommunications domain - direct measure of area characteristics that impact on deprived individuals.

This study – in common with others – uses postcodes in the 'worst' 15 per cent of data zones to define multiple deprivation. Further details of SIMD2004 are available at: www.scotland.gov.uk/stats/simd2004/

Car Ownership

Number of cars in the household: none, one, 2+.

Index of Provision for Sport

This was calculated by using sportscotland's Facility Planning Model relative-share approach. This estimates the capacity of facilities and allocates demand from each output area to local facilities using a spatial interaction

model. The share of capacity per demand unit for each output area is calculated from this allocation. The allocation of demand uses car ownership at the output area level to estimate the proportion of demand which will travel by car, foot or public transport to each facility. The share values for each sport (swimming, hall sports, pitch sports, golf, outdoor bowling and indoor bowling) are standardised by subtracting the mean and dividing by the standard deviation to give a national average score of 0. The overall index is generated by weighting the individual scores for each sport according to their relative contribution to the overall visits estimated from the sports participation data gathered for **sportscotland** in the Scottish Opinion Survey.