



**Comparisons of health-related behaviours  
and health measures in Greater Glasgow  
with other regional areas in Europe**

**April 2008**

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This project compared health indicators in Greater Glasgow with those in a number of areas across Europe: within England, Northern Ireland, the Republic of Ireland, Wales, Sweden, Finland, Norway, Spain, Belgium and Germany.

## **Key findings**

- ❖ Greater Glasgow did not stand out as having a particularly worse socio-economic profile, being similar in terms of social class to many of the other areas; although it has the highest proportion with no qualifications, there were a number of areas with comparable education profiles.
- ❖ Excess weekly alcohol consumption in Greater Glasgow was compared with Eastern Northern Ireland and selected areas in England. Prevalence was significantly higher in Greater Glasgow compared with Eastern Northern Ireland, but similar for the areas in England.
- ❖ Binge drinking in Greater Glasgow was compared with Cardiff and areas in England. Accounting for socio-economic circumstances, the likelihood of binge drinking in men in Greater Glasgow was significantly higher relative to Cheshire & Merseyside. Among women, the Greater Glasgow figure was significantly higher than in Cheshire & Merseyside and Cardiff.
- ❖ Female smoking prevalence rates in Greater Glasgow were higher than most areas. Smoking prevalence in men in Greater Glasgow was higher than in Greater Manchester, Cheshire & Merseyside, Eastern Northern Ireland, Malmo, Helsingborg, Lund, and Oslo, but lower than Madrid, Barcelona, Valencia, and Berlin.
- ❖ Physical activity rates in Greater Glasgow were compared with other UK areas. Adequate levels in men in Greater Glasgow were significantly lower than in Eastern Northern Ireland and Cardiff, but comparable with areas in England. Among women, Greater Glasgow actually had significantly higher rates than Greater Manchester, Eastern Northern Ireland and Cardiff.

- ❖ Obesity levels tended to be higher in Greater Glasgow than in the other areas.
  
- ❖ Diabetes prevalence in Greater Glasgow was compared with areas in England, Germany, and, for men only, Dublin, Stockholm, Oslo and areas in Spain. Male diabetes prevalence in Greater Glasgow was significantly higher than in Greater Manchester and Cheshire & Merseyside, and significantly lower than in Seville. Likelihood of non-gestational diabetes among women was lower in some areas in England and higher in Berlin than in Greater Glasgow.
  
- ❖ Self-reported general health in Greater Glasgow was compared with all selected areas with the exceptions of Dublin, Cardiff and Oslo. The likelihood of reporting bad or very bad general health was higher in Greater Glasgow than in Eastern Northern Ireland and areas in Sweden, Belgium, Spain and Germany, with the exceptions of Malaga, Bremen and Saxony; rates for England and Southern Finland were not different from those in Greater Glasgow. For women, rates in Greater Glasgow were also higher than those in Cheshire & Merseyside, but not different to those in Malmö, Helsingborg, Spain, Berlin or Hamburg.
  
- ❖ Long-standing illness in Greater Glasgow was compared with all selected areas with the exceptions of Dublin, Cardiff, Oslo and Southern Finland. Greater Glasgow had higher rates than reported in Eastern Northern Ireland, and most areas in Sweden, Belgium and Germany; rates were significantly lower than in Northumberland, Tyne & Wear. Except for some of the areas in England and Germany, the prevalence among women was significantly higher in Greater Glasgow than in other regions.
  
- ❖ Acute sickness in Greater Glasgow was compared with areas in England, Eastern Northern Ireland, and Sweden (except Stockholm). Occurrence in Greater Glasgow was only significantly higher than that for men in Malmö.

- ❖ Psychological morbidity in Greater Glasgow was compared with areas in England, Eastern Northern Ireland, Sweden and Belgium. Prevalence in Greater Glasgow was higher than all other areas; significantly so compared with Greater Manchester (women) Malmö (men), Helsingborg, Lund and in Belgium except Brussels and Liege.

**Summary:** how health-related behaviours and health outcome measures for Greater Glasgow compared with other selected European areas

Characteristic	Greater Glasgow better than	Greater Glasgow worse than	Greater Glasgow similar to	Greater Glasgow better than	Greater Glasgow worse than	Greater Glasgow similar to
	<b>Men</b>			<b>Women</b>		
<b>Excess weekly alcohol consumption</b>		Eastern Northern Ireland	English areas <sup>a</sup>		Eastern Northern Ireland	English areas <sup>a</sup>
<b>Binge drinking</b>		Chester & Merseyside	Greater Manchester, Northumberland and, Tyne & Wear, Cardiff		Chester & Merseyside, Cardiff	Greater Manchester, Northumberland and, Tyne & Wear
<b>Smoking</b>	Madrid, Barcelona, Valencia, Berlin	Greater Manchester, Cheshire & Merseyside, Eastern Northern Ireland, Malmö, Helsingborg, Lund, and Oslo,	Northumberland and, Tyne & Wear, Dublin, Cardiff, Stockholm, Southern Finland, Belgian areas <sup>b</sup> , Seville, Malaga, German areas <sup>c</sup> (except Berlin)		Greater Manchester, Cheshire & Merseyside, Cardiff, Swedish areas <sup>d</sup> , Oslo, Southern Finland, Belgian areas <sup>b</sup> (except Liège), Spanish areas <sup>e</sup> (except Madrid), Bavaria, Baden-Württemberg, North Rhine-Westphalia, Saxony	Northumberland, Tyne & Wear Eastern Northern Ireland, Dublin, Liège, Madrid, Berlin, Hamburg, Bremen, Lower Saxony
<b>Physical activity</b>	English areas <sup>a</sup>	Eastern Northern Ireland, Cardiff		Northumberland and, Tyne & Wear, Cheshire & Merseyside	Greater Manchester, Eastern Northern Ireland, Cardiff	
<b>Obesity</b>		Eastern Northern, Swedish areas <sup>d</sup> , Oslo, Belgian areas <sup>b</sup> (except Hainaut, Namur), Spanish areas <sup>e</sup> (except Seville), Berlin, Hamburg, Baden-Württemberg, North Rhine-Westphalia	English areas <sup>a</sup> , Dublin, Cardiff, Southern Finland, Hainaut, Namur, Seville, Bavaria, Bremen, Lower Saxony, Saxony	Dublin	Swedish areas <sup>d</sup> , Oslo, Belgian areas <sup>b</sup> (except Hainaut), Spanish areas <sup>e</sup> (except Malaga), Bavaria, Baden-Württemberg, North Rhine-Westphalia	English areas <sup>a</sup> , Eastern Northern, Cardiff, Southern Finland, Hainaut, Malaga, Berlin, Hamburg, Bremen, Lower Saxony, Saxony
<b>Diabetes</b>	Seville	Greater Manchester, Cheshire & Merseyside	Northumberland, Tyne & Wear, Dublin, Stockholm, Oslo, Spanish areas <sup>e</sup> (except Seville), German areas <sup>c</sup>	Berlin	Northumberland, Tyne & Wear, Cheshire & Merseyside	Greater Manchester, German areas <sup>c</sup> (except Berlin)

<b>Self-assessed general health</b>		Eastern Northern Ireland, Swedish areas <sup>d</sup> , Belgian areas <sup>b</sup> , Spanish areas <sup>e</sup> , German areas <sup>c</sup> (except Bremen)	English areas <sup>a</sup> , Southern Finland, Bremen		Cheshire & Merseyside, Eastern Northern Ireland, Lund, Stockholm, Belgian areas <sup>b</sup> (except Liège), Bavaria, Baden-Württemberg, North Rhine-Westphalia, Lower Saxony, Saxony	Greater Manchester, Northumberland and, Tyne & Wear, Malmö, Helsingborg, Southern Finland, Liège, Spanish areas <sup>e</sup> , Berlin, Hamburg, Bremen,
<b>Long standing illness</b>	Northumberland, Tyne & Wear	Eastern Northern Ireland, Swedish areas <sup>d</sup> , Belgian areas <sup>b</sup> (except Liège, Namur), Bavaria, Baden-Württemberg, North Rhine-Westphalia, Lower Saxony, Saxony	Greater Manchester, Cheshire & Merseyside, Liège, Namur Berlin, Hamburg, Bremen		Eastern Northern Ireland, Swedish areas <sup>d</sup> , Belgian areas <sup>b</sup> , Bavaria, Bremen, Lower Saxony	English areas <sup>a</sup> , Berlin, Hamburg, Baden-Württemberg, North Rhine-Westphalia, Saxony
<b>Acute sickness</b>		Malmö	English areas <sup>a</sup> , Eastern Northern Ireland, Helsingborg, Lund			English areas <sup>a</sup> , Eastern Northern Ireland, Malmö, Helsingborg, Lund
<b>Psychological morbidity</b>		Swedish areas <sup>d</sup> (except Stockholm), Belgian areas <sup>b</sup> (except Brussels, Liège)	English areas <sup>a</sup> , Eastern Northern Ireland, Stockholm, Brussels, Liège		Greater Manchester, Helsingborg, Lund, Belgian areas <sup>b</sup> (except Brussels, Liege)	Northumberland and, Tyne & Wear, Cheshire & Merseyside, Eastern Northern Ireland, Malmö, Stockholm, Brussels, Liege

Results are adjusted for age, social class and educational qualification

a English areas: Greater Manchester, Northumberland Tyne & Wear and Cheshire & Merseyside

b Belgian areas: Brussels, Antwerpen, East Flanders, Hainaut, Liège, West Flanders and Namur

c German areas: Berlin, Hamburg, Bayern, Baden-Württemberg, Nordrhein-Westfalen, Bremen, Niedersachsen and Sachsen

d Swedish areas: Malmo, Helsingborg, Lund and Stockholm

e Spanish areas: Madrid, Barcelona, Valencia, Seville and Malaga,

## **Introduction**

International comparisons of health indicators – such as prevalence and determinants of diseases – provide external standards against which status for individual areas can be measured (1), offering a framework for the setting and monitoring of public health goals. The international position of Scotland/UK as a whole has been identified by a variety of international assessments (2-11), with the country having an unfavourable placing in relation to Western Europe. The Greater Glasgow area, known for its poor health position within Scotland, has been shown to have an overall poorer profile than the rest of the country as a whole (12).

As well as international country-level comparisons (13) and regional comparisons within Scotland, there is interest in international comparisons of regions within European countries which could aid understanding of local health features of Greater Glasgow in an international context.

With extremes in affluence, but mass concentrations of deprivation, Greater Glasgow's socio-economic profile must be taken into account when comparing health and related behaviours with other areas. For instance, in a national context, differences in risk factors for coronary heart disease between Edinburgh and Greater Glasgow are largely explained by socio-economic differences between the cities (14); factors such as higher smoking rates and cardiovascular disease prevalence disappeared following adjustment for socio-economic circumstances in Greater Glasgow-Scotland comparisons (12). Any international differences in health and behaviours may be explained by socio-economic disparities as well as distinct historical and societal contexts.

Population-based health surveys from individual countries in Europe share some common design features and it is therefore possible to combine aspects of available data, permitting international regional comparisons. Demographic, health-related behaviour, health outcome, and socio-economic items are generally available from such studies. Further education and occupation based social class are internationally harmonious measures of socio-economic classification (15, 16) suitable for European comparisons.

## Aims and purpose

The aim of this work is to help build a deeper understanding of Greater Glasgow's health relative to that of regional areas in other countries by comparing health-related behaviours and health measures in the Greater Glasgow area with different European regions. Comparisons were made with areas across England, Northern Ireland, the Republic of Ireland, Wales, Sweden, Finland, Norway, Spain, Belgium and Germany. The extent to which differences were due to variation in socio-economic circumstances was investigated.

## Approach and Methods

The comparison areas are shown in Table 1.

**Table 1:** Source of survey data for European regional areas

Country	Area	Sample size	Survey	Years
Scotland	Greater Glasgow*	1,267	Scottish Health Survey	2003
England	Greater Manchester	1,587	Health Survey for England	2002-2004
	Cheshire & Merseyside	1,072		
	Northumberland, Tyne & Wear	1,512		
Northern Ireland	Eastern Northern Ireland	4,260	Northern Ireland Health and Wellbeing Survey	2001-2005
Republic of Ireland	Dublin	111	Survey on Lifestyle And Nutrition	2002
Wales	Cardiff	2,222	Welsh Health Survey	2003-2004
Sweden	Malmö	4,260	Health Survey for Scania	2004
	Helsingborg	2,664		
	Lund	4,633		
	Stockholm	31,120	Stockholm Public Health Survey	2002
Norway	Oslo	18,785	Cohort of Norway	2001
Finland	Southern Finland	897	Health Behaviour among the Finnish Adult	2003

			Population Survey	
Belgium	Brussels	5,634	Health Interview Survey Belgium	2004
	Antwerpen	2,181		
	East Flanders	1,580		
	Hainaut	2,787		
	Liège	2,077		
	West Flanders	1,284		
	Namur	847		
Spain	Madrid	1,998	Spanish Health National Survey	2001
	Barcelona	1,538		
	Valencia	871		
	Seville	495		
	Malaga	329		
Germany	Berlin	390	German Telephone Health Survey	2003
	Hamburg	199		
	Bavaria	1,266		
	Baden-Württemberg	1,053		
	North Rhein Westfalen	1,768		
	Bremen	81		
	Lower Saxony	782		
	Saxony	373		
<b>Total</b>		<b>101,923</b>		

\* preceded the creation of NHS Greater Glasgow and Clyde from the split of NHS Argyll and Clyde in 2006

Where compatible data permitted, comparisons were made of the health-related behaviours and health outcomes shown in Table 2.

**Table 2:** Definitions of health-related behaviours and health outcomes included in comparisons

<b>Health-related behaviour</b>	<b>Definition</b>
Excess weekly alcohol consumption	Exceeding the recommended weekly alcohol limits of 21 units for men and 14 for women during the week prior to survey
Binge drinking	Consumption of eight units or more for men and six or more for women on the heaviest drinking day during the week prior to survey
Smoking	Current smoking status

Physical activity	Meeting the recommended levels of 30 minutes or more of moderate to vigorous accumulated physical activity on at least five days per week
Obesity	Body mass index of 30kg/m <sup>2</sup> or more
<b><u>Health outcome</u></b>	<b>Definition</b>
Diabetes	Doctor-diagnosed diabetes excluding women who had only had diabetes during pregnancy
Self-assessed general health	Self assessment of 'bad' or 'very bad' general health
Long standing illness	An ongoing illness, disability or infirmity
Acute sickness	Illness or injury restricting activity in the two weeks prior to survey
Psychological morbidity	General Health Questionnaire 12 score of four or more

As well as age and sex, the following socio-economic data were available for most areas (see Figures Ai & ii):

- highest educational qualification attained (no qualifications; below degree level; *or* degree level or above); and
- occupation-based social class (*equivalent to* professional / managerial; skilled non-manual / skilled manual; *or* semi-skilled manual / unskilled manual).

With variations in educational and social classification systems across countries, these groupings offered the most homogeneous categorisations (see Appendices A and B).

### Statistical methods

All analyses involved logistic regression models fitted separately for men and women. Firstly, the relationship between the outcome (e.g. alcohol consumption), and the explanatory factor (living in a European regional area compared with living in Greater Glasgow Health Board region) was modelled adjusting for age alone. Analysis then incorporated additional socio-economic adjustment by social class and educational qualification attainment together<sup>1</sup> to assess the effect of socio-economic factors on the relationship between area of residence and the outcome. To reduce bias, missing data were multiply imputed using standard methods.

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<sup>1</sup> In the case of areas for which only social class *or* education were available, the single available socio-economic variable was incorporated only. See areas in Figures Ai & ii with no data.

## Findings

Prevalence of health-related behaviours and health outcomes in Greater Glasgow are shown in Table 3.

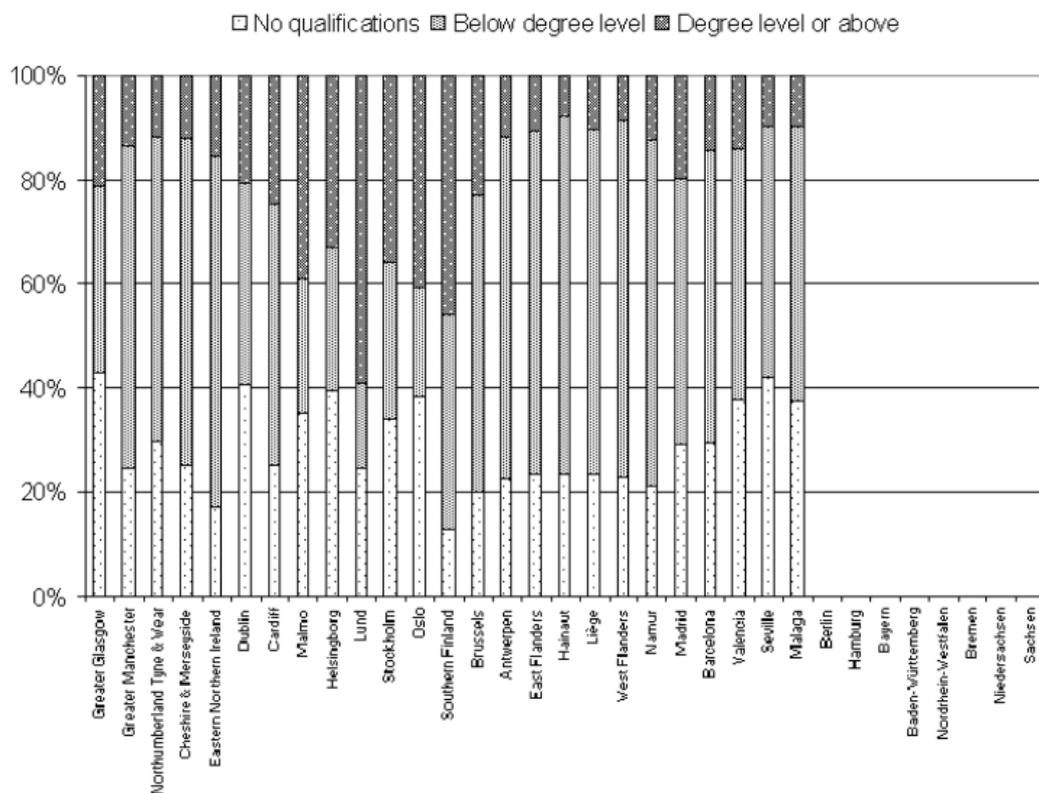
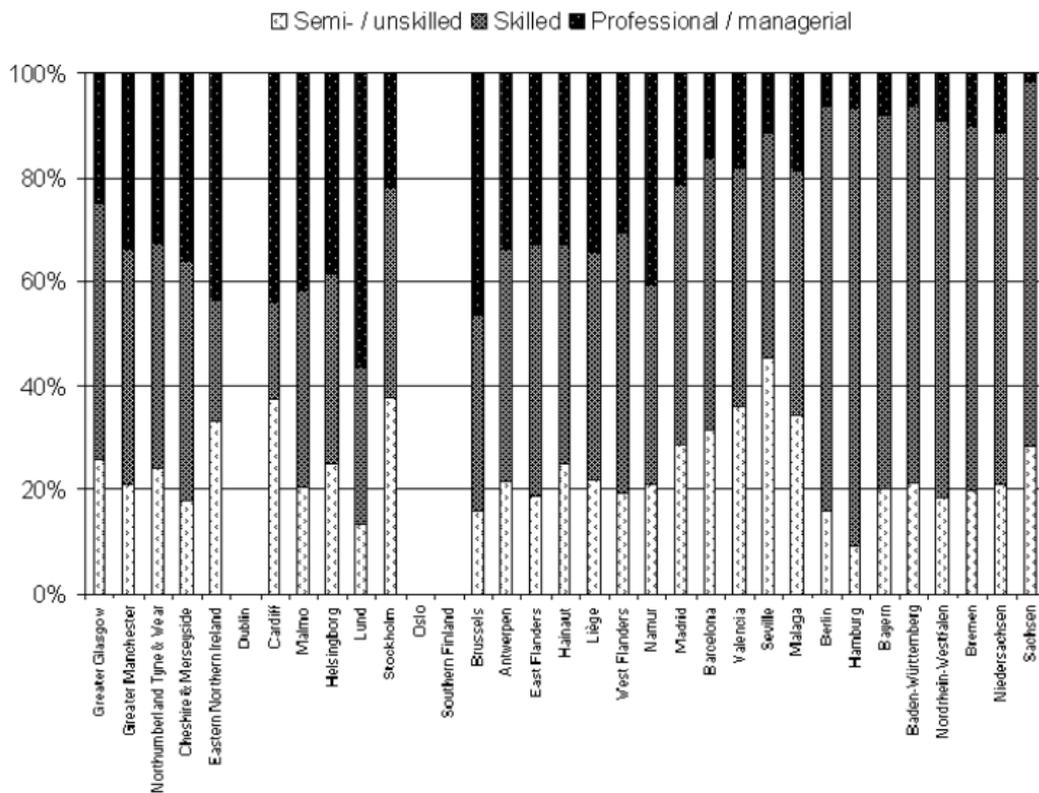
**Table 3:** Prevalence of health-related behaviours and health outcomes in Greater Glasgow

	Prevalence (%) and 95% CI	
	Men	Women
Excess weekly alcohol consumption	32 (28 to 36)	17 (14 to 20)
Binge drinking	45 (41 to 50)	31 (27 to 35)
Smoking	34 (30 to 39)	35 (31 to 38)
Physical activity	39 (34 to 43)	28 (24 to 31)
Obesity	20 (16 to 23)	22 (19 to 25)
Diabetes	3.6 (2.2 to 5.1)	4.3 (2.8 to 5.7)
Self-assessed general health	11 (8 to 13)	11 (8 to 13)
Long standing illness	40 (36 to 44)	47 (44 to 51)
Acute sickness	18 (15 to 22)	21 (18 to 24)
Psychological morbidity	16 (13 to 19)	23 (20 to 26)

Social class data were available and classifiable for all areas except Dublin, Oslo and Southern Finland (Figure Ai). For all other areas combined, the overall breakdown by social class was 28% professional/managerial technical or equivalent (25% for Greater Glasgow); 43% skilled or equivalent (49% for Greater Glasgow) and 29% semi- or unskilled (26% for Greater Glasgow).

Education data were available and classifiable for all but the German areas (Figure Aii). Of the entire sample, 31% had no formal education, 37% were educated to below degree level and 31% had degree level or above qualifications. The percentage with no qualifications varied from 13% in Southern Finland to 43% in Greater Glasgow. The percentage with degree or above ranged from 8% in Hainaut, Belgium to 59% in Lund, Sweden. The percentages for Greater Glasgow were 36% educated to below degree level and 21% educated to degree level and above.

Figures Ai & Aii: Social class and education



## **Health-related behaviours**

### **Excess weekly alcohol consumption**

In Greater Glasgow, the proportion of the adult population reporting excess weekly alcohol consumption (Table 2) was 32% for men and 17% for women. Comparison of excess weekly alcohol consumption in Greater Glasgow could be made with areas in England and Eastern Northern Ireland. Compared with Greater Glasgow, the likelihood of excess weekly alcohol consumption was significantly lower for Eastern Northern Ireland but not for the selected areas in England. Adjustment by social class and education did not alter any conclusions (Figure 1a). Findings were equivalent among women (Figure 1b).

### **Binge drinking**

Binge drinking (Table 2) prevalence in Greater Glasgow was 45% and 31% for men and women respectively. Comparisons of binge drinking in Greater Glasgow with areas in England and Cardiff were made. Although there were no significant differences among the age-only adjusted results in men, accounting for socio-economic circumstances revealed a lower prevalence of binge drinking in Cheshire & Merseyside compared with Greater Glasgow (Figure 2a). Among women, binge drinking was significantly lower in Cheshire & Merseyside and Cardiff than in Greater Glasgow (Figure 2b).

### **Smoking**

The smoking (Table 2) prevalence rates in Greater Glasgow were 34% for men and 35% for women. Smoking in Greater Glasgow could be compared with all of the 32 other regions. Relative to Greater Glasgow, the likelihood of smoking among men was lower in Greater Manchester, Cheshire & Merseyside, Eastern Northern Ireland, Malmo, Helsingborg, Lund, Stockholm and Oslo, and higher in Madrid, Barcelona, Valencia, Malaga and Berlin (Figure 3a). Adjustment for socio-economic circumstances led to non-significant results for Stockholm, and Malaga.

Results were also varied for women, though the majority of areas had lower smoking prevalence than Greater Glasgow (Figure 3b). In most cases socio-economic adjustment made only minor changes to results. Exceptions were Liège, which was not significantly different to Greater Glasgow, and Seville, which was significantly lower following adjustment.

### **Physical activity**

Adequate physical activity was achieved by 39% (men) and 28% (women) in Greater Glasgow (Table 2). Comparisons could be made between physical activity levels in Greater Glasgow and areas in England, Eastern Northern Ireland and Cardiff. Rates of adequate physical activity in areas in England were lower, though comparable with those in Greater Glasgow, but those in Eastern Northern Ireland and Cardiff were significantly lower than Greater Glasgow (Figure 4a).

Among women, Eastern Northern Ireland and Cardiff had significantly lower age only-adjusted rates than Greater Glasgow (Figure 4b). On socio-economic adjustment, rates were also lower than Greater Glasgow in Greater Manchester.

### **Obesity**

Obesity (Table 2) prevalence was 20% in men and 22% in women in Greater Glasgow. Obesity in Greater Glasgow was compared with all 32 other regions. Obesity levels tended to be lower in the other areas – among men none of the regions had significantly higher rates than Greater Glasgow, and adjustment for socio-economic circumstances made little difference (Figure 5a). There was one exception for women – Dublin – which had significantly higher obesity rates than Greater Glasgow, and these remained following socio-economic adjustment (although caution is required with interpretation since this is based on a very small sample size) (Figure 5b).

## **Health outcomes**

### **Diabetes**

Diabetes (excluding gestational diabetes) had been diagnosed by a doctor in 3.6% of men and 4.3% of women in Greater Glasgow (Table 2). Diabetes prevalence in Greater Glasgow could be compared with that in areas in England and Germany for both men and women, and additionally in Dublin, Sweden and Spain for men only. Among men, prevalence was significantly lower in Greater Manchester and Cheshire & Merseyside, and significantly higher in Seville compared with Greater Glasgow (Figure 6a). Likelihood of female non-gestational diabetes was lower in areas in England and higher in Berlin relative to Greater Glasgow. After socio-economic adjustment, results became non-significant in Greater Manchester (Figure 6b).

### **Self-reported general health**

Self-reported bad or very bad general health (Table 2) for both men and women was 11% in Greater Glasgow. Self-reported health in Greater Glasgow could be compared with all of the selected areas, with the exceptions of Dublin, Cardiff and Oslo. Compared with Greater Glasgow, the male prevalence of reporting bad or very bad general health was lower in Eastern Northern Ireland, and in areas in Sweden, Belgium, Spain and Germany, with the exceptions of Malaga, Bremen and Saxony (Figure 7a). Figures for England and Southern Finland were not different from those in Greater Glasgow. Socio-economic adjustment resulted in significantly lower prevalence in Saxony. For women, rates of reporting bad or very bad general health were also lower in Cheshire & Merseyside, Eastern Northern Ireland, Lund, Stockholm, and in areas in Belgium, and Germany (with the exceptions of Berlin, Hamburg and Bremen) than in Greater Glasgow, but those in Malmö, Helsingborg, Southern Finland and Spain, were similar to those in Greater Glasgow (Figure 7b). Results for Liège were not significant following socio-economic adjustment.

### **Long-standing illness**

Prevalence of long-standing illness (Table 2) for Greater Glasgow was 40% in men and 47% in women.. Figures for Greater Glasgow could be compared with those in Eastern Northern Ireland and areas in England, Sweden, Belgium and Germany. Eastern Northern Ireland and, with the exception of Liege, Berlin, Hamburg and Bremen, areas in Sweden, Belgium and Germany had lower long-standing illness rates than Greater Glasgow. Northumberland, Tyne & Wear had significantly higher rates (Figure 8a). Adjusting for socio-economic status resulted in non-significance in Namur.

Among women, only for Greater Manchester, Northumberland, Tyne & Wear, and some of the areas in Germany, was the prevalence not significantly lower than that in Greater Glasgow (Figure 8b). Socio-economic adjustment attenuated the significance of the results for Cheshire & Merseyside only.

### **Acute sickness**

Levels of self-reported acute sickness (Table 2) in Greater Glasgow were 18% for men and 21% for women.. Comparisons with the levels of acute sickness in Greater Glasgow were possible for areas in England, Eastern Northern Ireland, Malmö, Helsingborg and Lund. Among men, figures in Greater Glasgow were significantly lower than in Northumberland, Tyne & Wear, Eastern Northern Ireland, Malmö and Lund (Figure 9a). However, socio-economic adjustment attenuated results for all but Malmö. Acute sickness in women was not significantly different to Greater Glasgow in any of the comparison areas (Figure 9b).

### **Psychological morbidity**

Psychological (Table 2) morbidity prevalence was 16% for men and 23% for women in Greater Glasgow. Comparisons with Greater Glasgow could be made for Eastern Northern Ireland and areas in England, Sweden, and Belgium. Prevalence was lower for all areas, significantly so for Greater Manchester (women only), Malmö (men only), Helsingborg, Lund and for Belgium except Brussels and Liege relative to Greater Glasgow (Figures 10a & 10b).

## Conclusions

In socio-economic terms, the available data suggest that Greater Glasgow was not markedly different from a number of the other European areas analysed in this report. Nonetheless, health indicators in terms of health-related behaviours and, in particular, health outcomes were worse in Greater Glasgow relative to the other selected areas. Results for some measures varied by sex, and health circumstances in Greater Glasgow were not universally unfavourable however. For instance, adequate physical activity levels were better in Greater Glasgow compared with elsewhere in the UK. Differences in urban/rural compositions of the selected areas may have been a factor but these are unlikely to explain all of the observed differences.

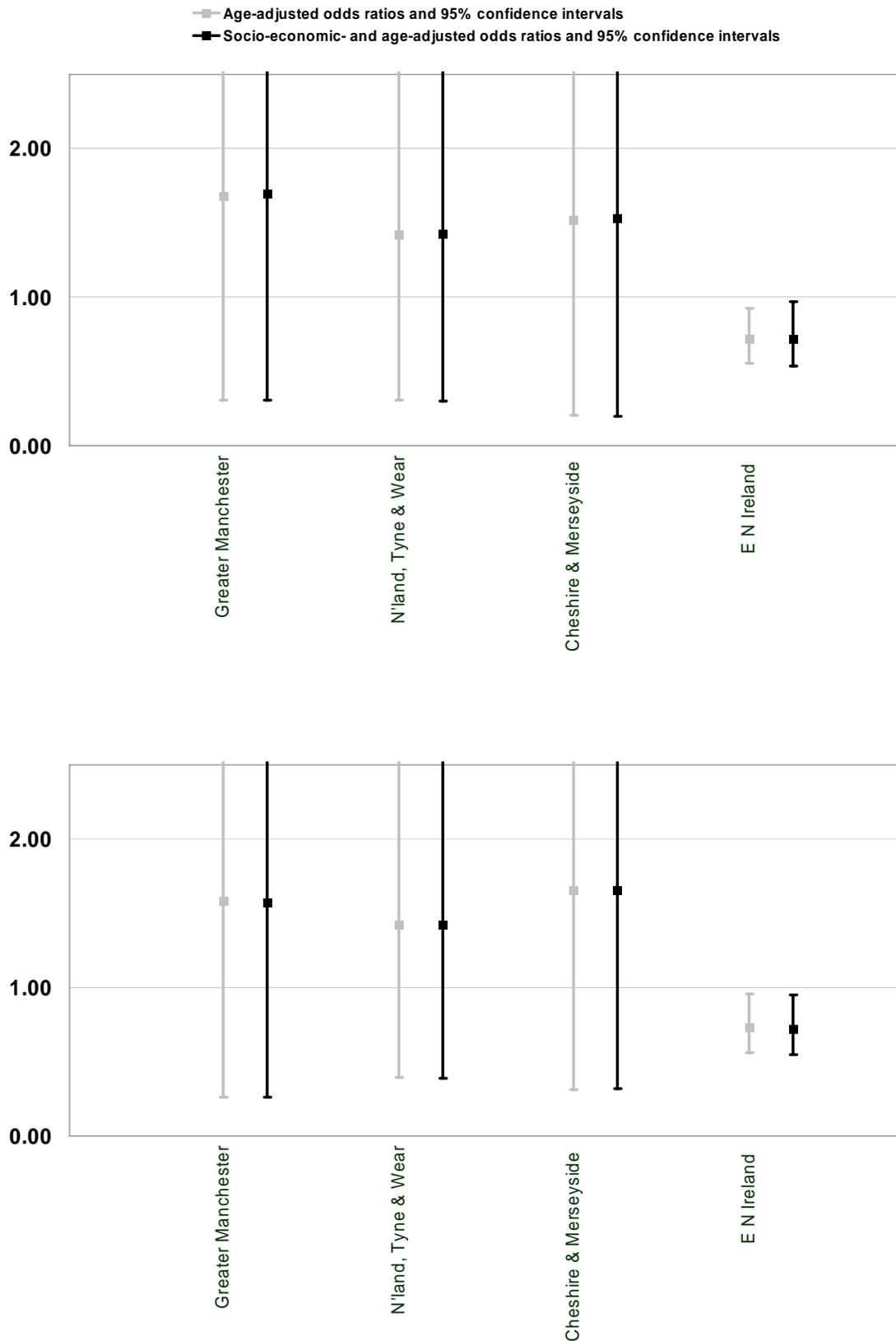
These findings reinforce results from a parallel piece of work, which found higher mortality rates in West of Scotland adults compared with similar post-industrial regions in Europe, including areas of Germany, Belgium and England (17). As in this report, the work on mortality also suggests that the findings cannot be explained by socio-economic deprivation. In addition, the mortality study quotes published rates of alcohol consumption and smoking prevalence which present a similar overall picture to those presented here. The finding that obesity levels in Greater Glasgow were significantly higher than most other areas is in line with findings from international country-level comparisons showing Scotland to have the highest prevalence of 17 Organisation for Economic Co-operation and Development countries, with the exception of the United States (18). Results for health outcomes, such as self-reported health and long-standing illness are consistent with findings of higher prevalence in Great Britain than in most other Western European countries (11).

Some aspects of health, such as long standing illness, were worse in a European context despite comparing favourably with the rest of Scotland in a previous piece of work (12). On a UK basis, not all health behaviours were worse in Greater Glasgow; however, some others (obesity, smoking) did compare badly, as did some health outcomes (diabetes).

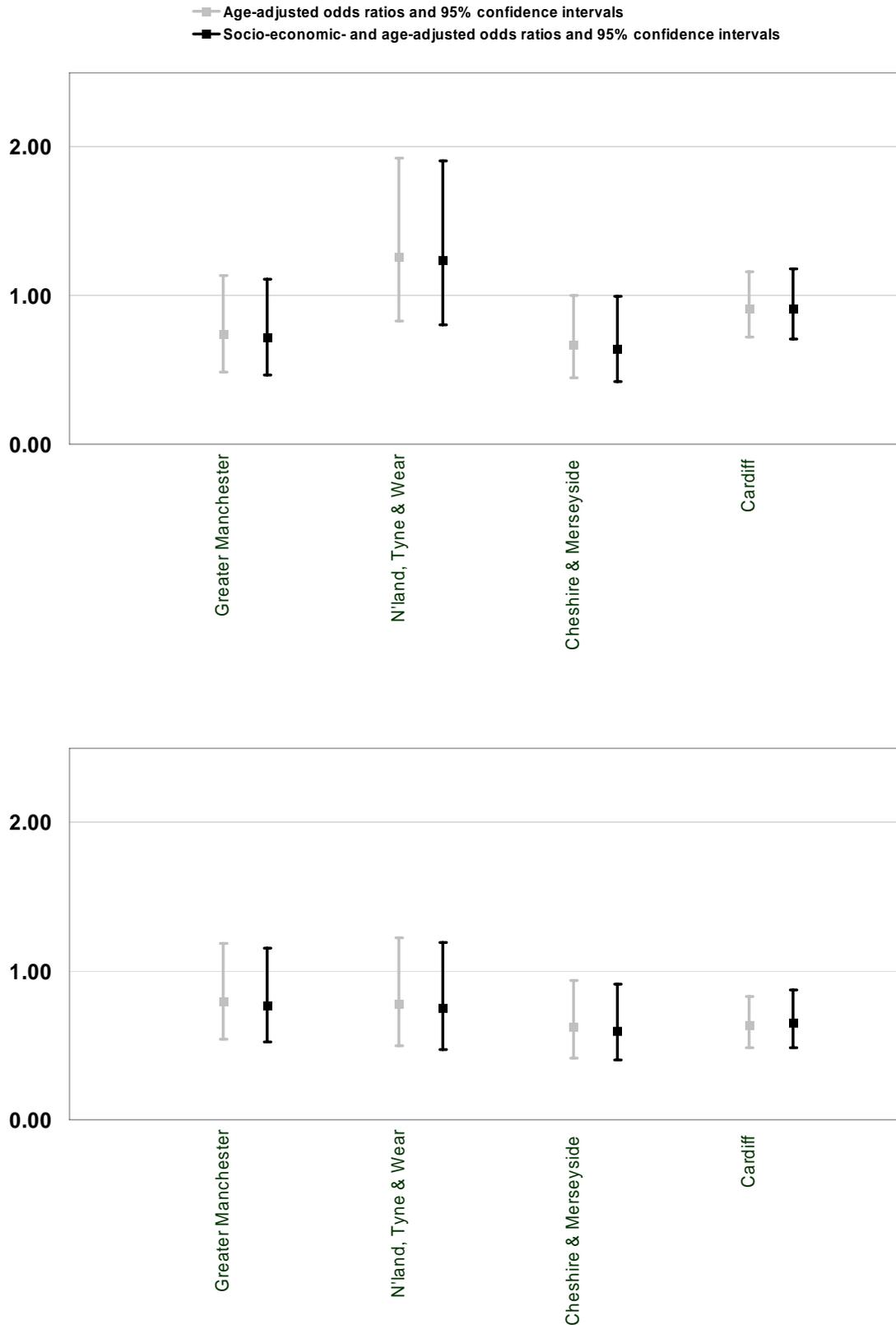
The main limitation of this study concerns the complexity of harmonising data from different surveys across countries. With variations in occupation-based social classification and education systems, it was not possible to equalise categories. However, relatively homogeneous groupings were achieved using the three classifications schemes. Variations in survey methodology may have also impacted on health indicator findings. In most countries the surveys involved face-to-face interviews, but exceptions were Germany, which was conducted by telephone, and the Republic of Ireland, Sweden and Finland, which were postal. In particular, such differences could potentially bias obesity results in favour of areas for which height and weight values were self-reported, as opposed to measured. However, generally, self-reported weight and height have been shown to be reasonably valid for population studies (19). There were a few areas, such as Dublin and some regions in Germany, for which the sample sizes available were relatively small – care must thus be taken when interpreting findings for these regions. It was nevertheless considered worthwhile reporting these results to allow more widespread representation.

In conclusion, the health position of the Greater Glasgow area relative to other selected areas in Europe is unfavourable, particularly in terms of smoking, obesity, and a number of self-assessed measures of morbidity.

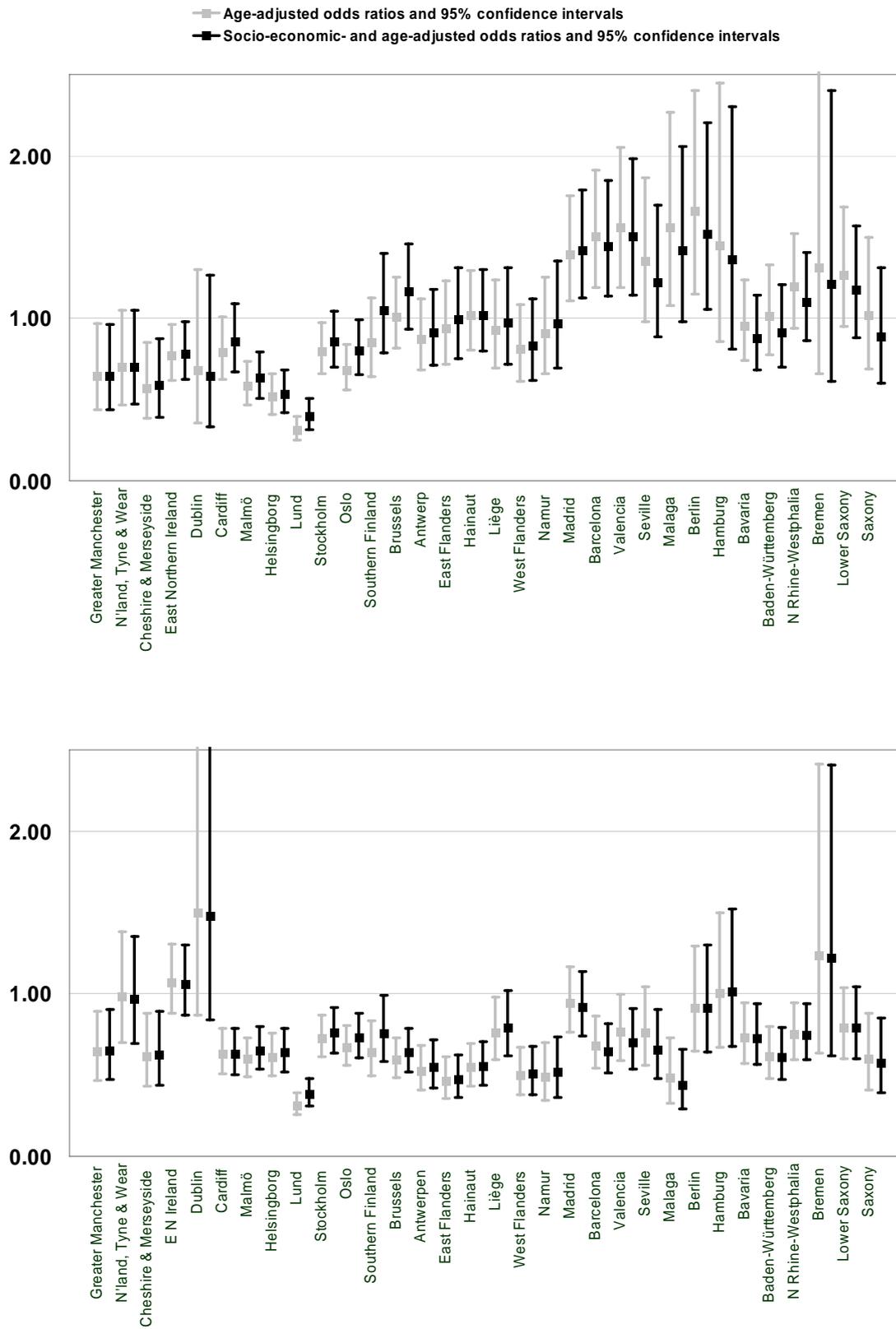
**Figure 1 a & b:** Comparison of excess weekly alcohol consumption in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



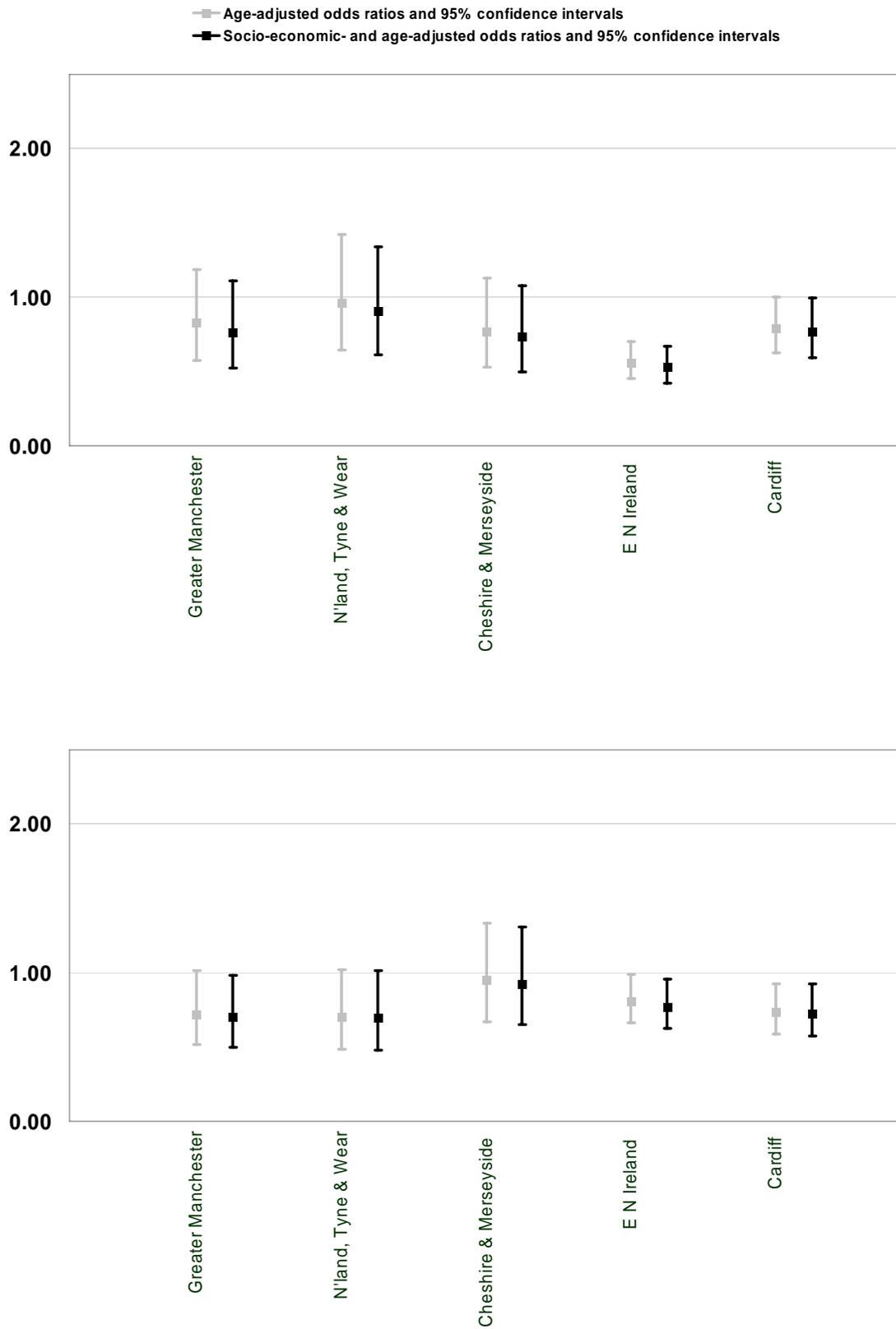
**Figure 2 a & b:** Comparison of binge drinking in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



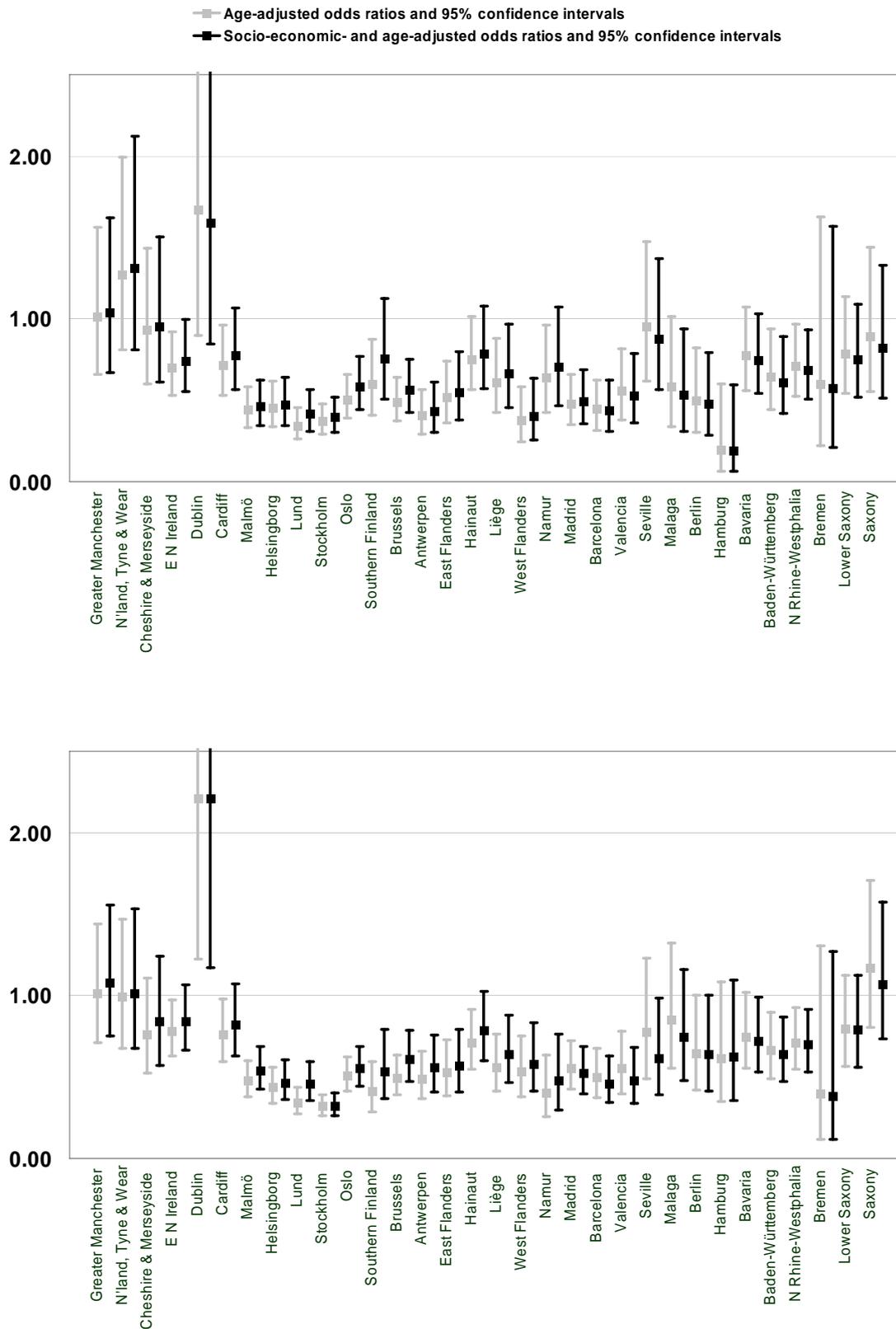
**Figure 3 a & b:** Comparison of smoking in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



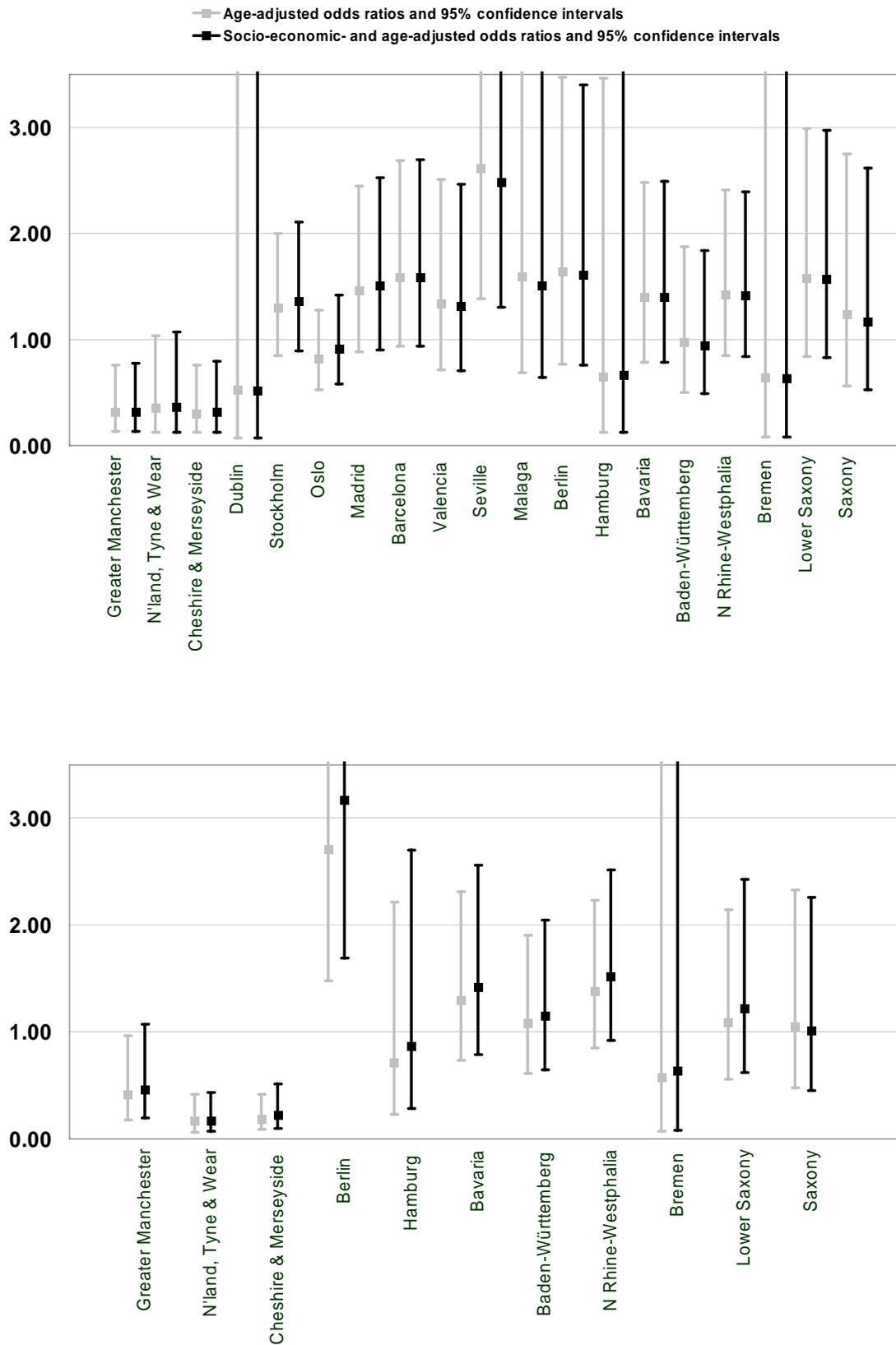
**Figure 4 a & b:** Comparison of physical activity in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



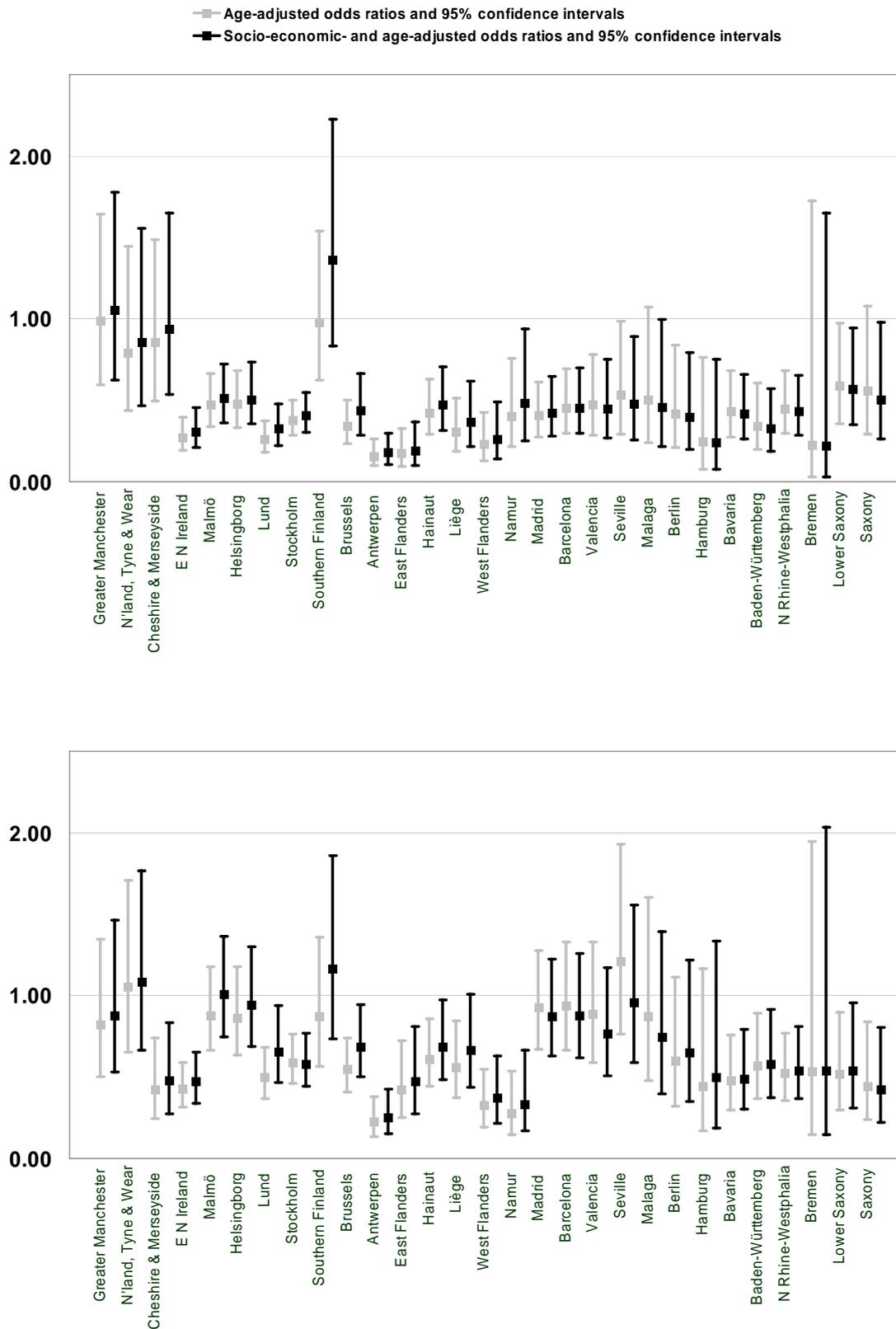
**Figure 5 a & b:** Comparison of obesity in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



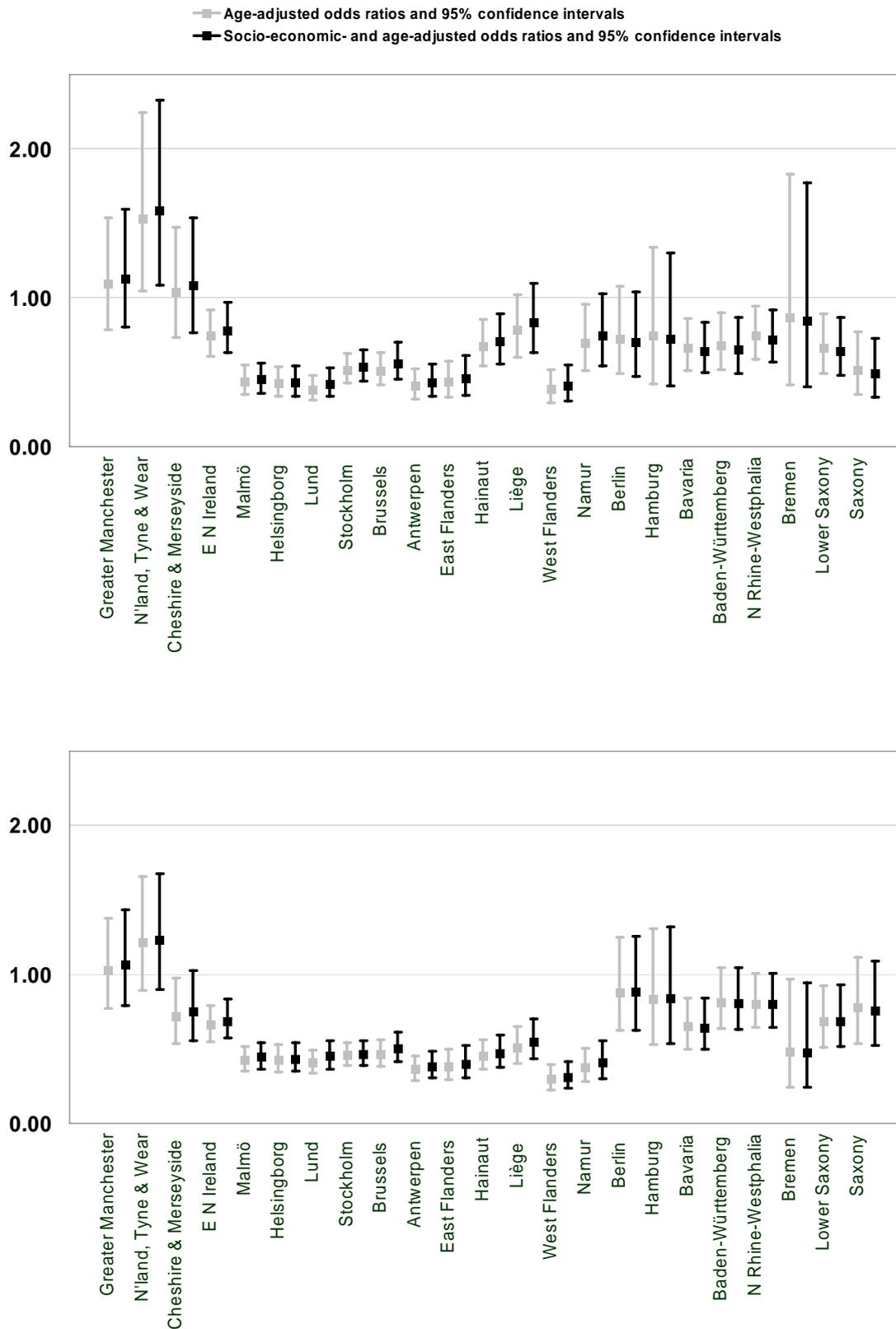
**Figure 6 a & b:** Comparison of diabetes in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



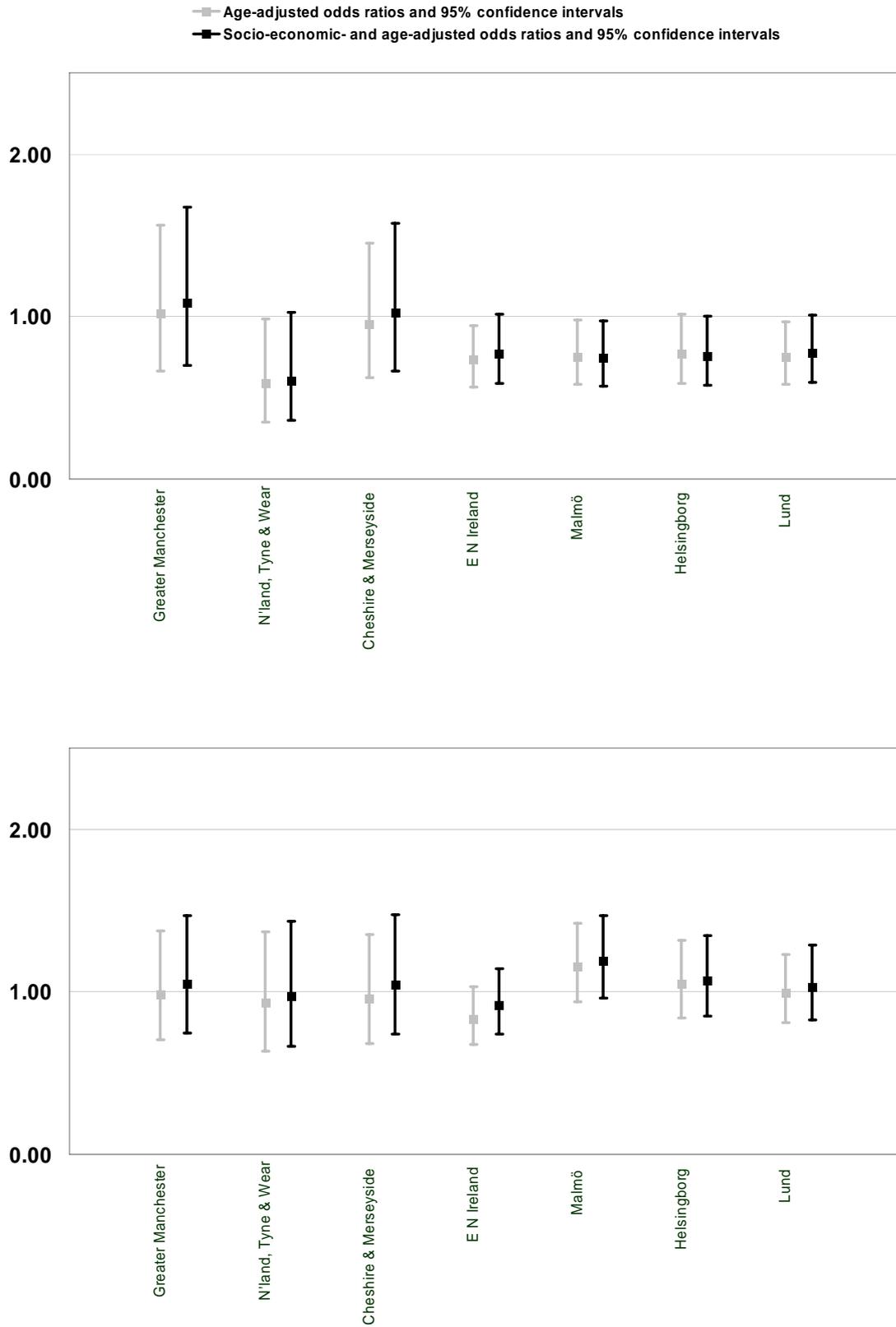
**Figure 7 a & b:** Comparison of self-reported bad/very bad general health in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



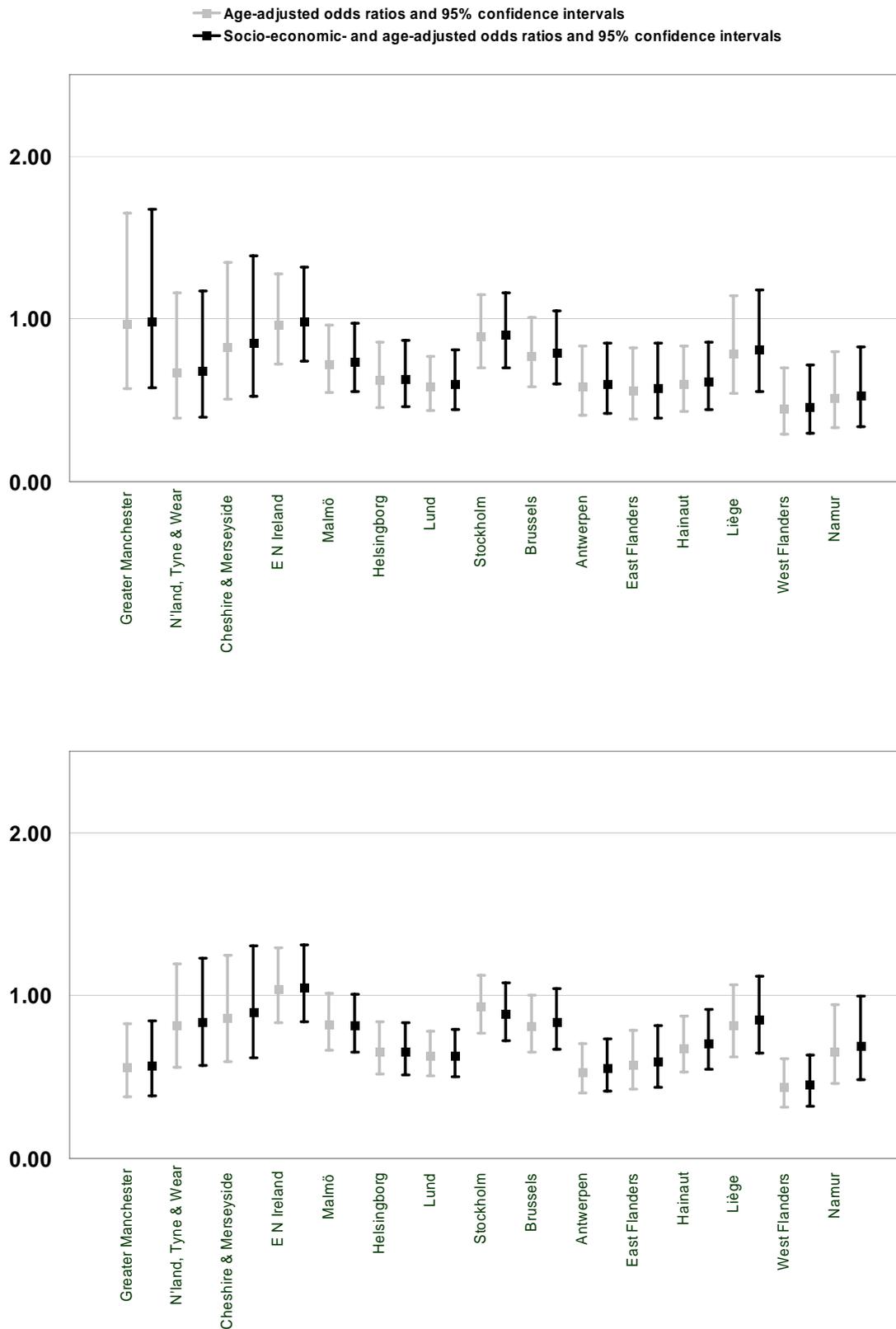
**Figure 8 a & b:** Comparison of long standing illness in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



**Figure 9 a & b:** Comparison of acute sickness in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



**Figure 10 a & b:** Comparison of psychological morbidity in regional areas compared with Greater Glasgow, adjusting for age only and additionally for socio-economic circumstances in men (above) and women (below)



## References

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## Acknowledgements

Data were provided by the following collaborators and institutions:

- Prof Juan Merlo and Henrik Ohlsson, Malmö University Hospital, Lund University, Malmö, Sweden;
- Prof Enrique Regidor, Universidad Complutense de Madrid, Spain;
- Dr Dermot O'Reilly, Queen's University Belfast, Northern Ireland;
- Dr Jean Tafforeau and Dr Kristina Bayingana, Scientific Institute of Public Health, Brussels, Belgium;
- Dr Cath Roberts and Anne Kingdon, Welsh Assembly Government, Cardiff, Wales;
- Satu Helakorpi, National Public Health Institute (KTL), Helsinki, Finland;
- Prof Cecily Kelleher, University College Dublin, Republic of Ireland;
- Prof Johan Hallqvist, Karolinska Institute, Stockholm, Sweden;
- Dr Øyvind Næss, Ullevål University Hospital, Oslo, Norway;
- Dr Cornelia Lange and Martin Kohler, Robert Koch-Institut, Berlin, Germany;
- ScotCen, UK; *and*
- UK Data Archive

Thank you to Prof Alastair Leyland, David Walsh, Prof Carol Tannahill, and Rosalia Munoz-Arroyo for their contributions to this work.

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Appendix A: Education classification scheme

Survey	Areas	Original education category	Assigned education group
Scottish Health Survey	Greater Glasgow	None of these qualifications	0
		GSVQ found / SVQ level 1 or 2 / Scotvec	1
		O grade / Standard grade / GCSE / CSE	1
		School leaving certif/ NNQ Access Unit	1
		City and Guilds	1
		GSVQ advanced / SQV lev 3 / ONC, OND	1
		Higher grade / A level / CSYS	1
		HNC / HND / SQV lev 4 or 5	1
		First degree / Higher degree	2
		Professional qualifications	2
Health Survey for England	Greater Manchester Northumberland Tyne & Wear Cheshire & Merseyside	No qualification	0
		Foreign/other	1
		NVQ1/CSE other grade equiv	1
		NVQ2/GCE O Level equiv	1
		NVQ3/GCE A Level equiv	1
		Higher ed below degree	1
		FT Student	1
		NVQ4/NVQ5/Degree or equiv	2
Northern Ireland Health and Wellbeing Survey	Eastern Northern Ireland	No Qualifications	0
		Higher Education	1
		A GCE Level	1
		GCSE A-C or equivalent	1
		GCSE D-G or equivalent	1
		Other Qualifications	1
		Degree Level or Higher	2
Survey on Lifestyle And Nutrition	Dublin	NO SCHOOLING	0
		PRIMARY SCHOOL EDUCATION ONLY	0
		SOME SECONDARY EDUCATION	0
		COMPLETE SECONDARY EDUCATION	1
		SOME THIRD LEVEL EDUCATION	1
		COMPLETE THIRD LEVEL EDUCATION	2
Welsh Health Survey	Cardiff	No qualifications	0
		Other qualifications	1
		Degree/degree equivalent and above	2
Health Survey for Scania	Malmo Helsingborg Lund	Elementary school	0
		Realsskola or girls school	1
		2-year gymnasium or vocational school	0
		3-4 year gymnasium	1
		University less than 3 years	2
		University more than 3 years	2

Stockholm Public Health Survey	Stockholm	Compulsory school (7 years)	0
		Compulsory school (9 years)	0
		Compulsory school (9-11 years)	0
		Compulsory school for girls (7-9 yers)	0
		Vocational school (after compulsory)	0
		Practical secondary school (years)	0
		2 year secondary school (years 10)	1
		Grammar school (years 10)	1
		University	2
Cohort of Norway	Oslo	No education	0
		Primary school (up to 6 years)	0
		O-level (9 years)	0
		A-level, basic (10 years)	0
		Videregående, avsluttende utdanning	1
		Qualification for A-level (12 years)	1
		University and college, bachelor (less than 16 years)	2
		Univeristy and college (more than 16 years)	2
		PhD	2
Health Behaviour among the Finnish Adult Population Survey	Southern Finland	2-9 years	0
		10-14 years	1
		15 or more years	2
Health Interview Survey Belgium	Brussels Antwerpen East Flanders Hainaut Liège West Flanders Namur	No or primary diploma;	0
		Lower secondary	1
		Higher secondary	1
		Higher (up to and including Higher education, non university (2-3 years))	1
		Higher education	2
		non university (4 years or more)	2
		University	2
Spanish Health National Survey	Madrid	Pre primary education or no education at all	0
	Barcelona	Primary education, or first stage of basic education	0
	Valencia	Lower secondary, or second stage of basic education	1
	Seville	Upper secondary education	1
	Malaga	Non-tertiary education	1
		First stage of tertiary education (graduate?)	2
		Second stage of tertiary education (post grad?)	2

Education data unavailable for the German Telephone Health Survey

Appendix B: Occupation-based social classification scheme

Survey	Areas	Original social class category	Assigned social class group
Scottish Health Survey	Greater Glasgow	Professional	1
		Intermediate	1
		Skilled (non-manual)	2
		Skilled (manual)	2
		Partly Skilled	3
		Unskilled	3
		Armed Forces	2
Health Survey for England	Greater Manchester, Northumberland Tyne & Wear, Cheshire & Merseyside	I - Professional	1
		II- Managerial technical	1
		IIIN - Skilled non-manual	2
		IIIM - Skilled manual	2
		IV - Semi-skilled manual	3
		V - Unskilled manual	3
		Others	2
Northern Ireland Health and Wellbeing Survey	Eastern Northern Ireland	Higher managerial and professional	1
		Lower managerial and professional	1
		Intermediate	2
		Lower supervisory and technical	2
		Semi-routine	3
		Routine	3
Welsh Health Survey	Cardiff	Managerial and professional occupations	1
		Intermediate occupations	2
		Routine and manual occupations	3
Health Survey for Scania	Malmö, Helsingborg, Lund	Higher white collar worker	1
		Middle white collar worker	1
		Lower white collar worker	1
		specialist knowledge worker	2
		Own company + farmer	2
		non specialist knowledge worker	3
		Disability pension	9
		Unemployed	9
		student	9
		Retired	9
		SEI-information existing	9
		non codabel	9
		Long/time sick leave	9

Stockholm Public Health Survey	Stockholm	high grade non-manuals	1
		self-employed	1
		farmers	1
		medium grade non-manuals	2
		skilled manual workers	2
		unclassifiable (students homemakers retired etc)	2
		unskilled manual workers	3
		low grade non-manuals	3
Health Interview Survey Belgium	Brussels, Antwerpen, East Flanders, Hainaut, Liège, West Flanders, Namur	Senior officials and managers	1
		Professionals	1
		Technicians and associate professionals	1
		Clerks	2
		Service workers and shop and market sales workers	2
		Skilled agricultural and fishery workers	2
		Craft and related trades workers	2
		Plant and machine operators and assemblers	3
		Elementary occupations	3
		No information	9
Spanish Health National Survey	Madrid, Barcelona, Valencia, Seville, Malaga,	Managerial and professional	1
		Intermediate technical occupations	1
		Self-employed and service workers	2
		Skilled manual workers	2
		Semi-skilled and unskilled manual workers	3
German Telephone Health Survey	Berlin, Hamburg, Bayern, Baden- Württemberg, Nordrhein- Westfalen, Bremen, Niedersachsen, Sachsen	Civil servant	1
		Clerical-worker	2
		Self-employed	2
		other	2
		Blue-collar worker	3

Occupation data unavailable for Survey on Lifestyle And Nutrition, Cohort of Norway and Health Behaviour among the Finnish Adult Population Survey