

Neighbourhood deprivation and the cost of accessing gyms and fitness centres: national study in Wales

Tim Evans^a, Steven Cummins^{b*}, Tim Brown^a

^aSchool of Geography, Queen Mary University of London, Mile End Road, London, United Kingdom, E1 4NS

^bDepartment of Social & Environmental Health Research, London School of Hygiene & Tropical Medicine, 15-17 Tavistock Place, London, United Kingdom WC1H 9SH

*Corresponding author. Email: steven.cummins@lshtm.ac.uk, Tel: +44 0207 927 2741

Acknowledgements: Steven Cummins is supported by a National Institute of Health Research Senior Fellowship. The views and opinions expressed herein are those of the author and do not necessarily reflect those of the NIHR or the Department of Health.

This version is the author accepted manuscript. Full citation is:

Evans T, Cummins S, Brown T (2013) Does the cost of accessing physical activity resources vary by neighbourhood deprivation? National study in Wales *Health & Place* 24, 16-19

Abstract

It has been hypothesised that residents of deprived neighbourhoods have poorer economic access to physical activity resources, inhibiting physical activity. Here we explore whether the cost of accessing gyms and fitness centres varies by neighbourhood deprivation in Wales. The location of gyms and fitness suites were obtained, and a telephone survey of all facilities was conducted to collect entry price data. We tested associations between neighbourhood deprivation and mean entry prices for public and private facilities. The cost of accessing private facilities is lower in deprived versus affluent neighbourhoods, whereas costs are similar across all deprivation categories for public facilities.

Keywords: neighbourhood, physical activity, cost, access, deprivation, Wales

Highlights

- We tested whether the cost of accessing physical recreation facilities varied by neighbourhood deprivation
- Cost of accessing physical recreation resources was cheaper in more deprived neighbourhoods
- Inequalities in the cost of access became smaller as neighbourhood deprivation increased

BACKGROUND

Physical activity is spatially patterned, with residents of the most deprived neighbourhoods having the lowest physical activity levels (Van Lenthe and Mackenbach 2005, Yen and Kaplan 1998, Giles-Corti and Donovan 2002, Sundquist et al 1999, Macintyre and Ellaway 1998, Kavanagh et al 2005). This spatial patterning persists even after adjustment for personal socioeconomic status and other individual-level variables, suggesting that spatial inequities in the distribution of environmental factors relevant for the promotion of physical activity may be important.

Spatial variation in the availability of sports and recreation facilities have been a particular focus of investigation as an explanatory environmental factor for neighbourhood differences in physical activity (Macintyre et al 1993, Estabrooks et al 2003, Macintyre et al 2008, Giles-Corti and Donovan 2002, Gordon-Larsen et al 2006, Powell et al 2006, Hillsdon et al 2007, Lamb et al 2010, Pearce et al 2007). However, the published evidence on the spatial distribution of sports and recreation facilities by neighbourhood deprivation is mixed (Jones et al 2007) with some studies reporting fewer resources in deprived neighbourhoods (Giles-Corti & Donovan 2002, Hillsdon et al 2007), others reporting no difference or no clear pattern (van Lenthe et al 2005, Lamb et al 2010), and others still, reporting fewer resources in more affluent neighbourhoods (Macintyre et al 2008). As a result, it has been suggested that the inconsistent findings reported to date may be due to neighbourhood differences in physical activity being more strongly associated with the nature, quality and affordability of facilities rather than their local availability (Lamb et al 2010). In particular, the cost of accessing physical activity resources may be a deterrent for residents of deprived

communities. However, studies investigating the cost of accessing physical activity resources by neighbourhood deprivation are rare and appear to be confined to a single city-level study that was undertaken in Perth, Australia. This study reported that the cost of accessing facilities was greater in more disadvantaged areas though findings did not reach statistical significance (Arbel et al 2009).

In this paper we use national-level data to explore whether the cost of accessing general purpose formal recreation facilities (gyms and fitness centres) is greater in more deprived neighbourhoods in two ways. Firstly, we investigate whether neighbourhood differences in costs exist for all facilities, and secondly, whether neighbourhood differences in costs are patterned by public or private ownership.

METHODS

Data on all general purpose recreation facilities (gyms and fitness centres) in Wales (n=327) was obtained from SportWales, the national agency for sport. Data were supplied in June 2011 and was the most up-to-date data available at that time. Metadata within the dataset included site name, ownership type, telephone number and full unit postcode of each facility.

Neighbourhood data

Each facility was linked to a Lower Super Output Area (LSOA) using its full unit postcode, and each LSOA was then linked to a measure of neighbourhood deprivation. Lower Super Output Areas are a statistical geography developed by the Office of National Statistics (ONS) for the 2001 Census, and were designed to improve the reporting of small area statistics. In Wales there are 1,896 LSOA's with a mean population of 1500. Neighbourhood deprivation was measured using the 2011 Welsh Index of Multiple Deprivation (WIMD) (Welsh Government 2011). In the present analysis we used the income deprivation sub-domain of WIMD divided into quintiles, with quintile one containing the least deprived areas and quintile five containing the most deprived. This measure is the best publicly available area-level measure of low-income, and represents the proportion of low-income households (those in receipt of various forms of state income support, means-tested tax credits or asylum seeker support) in each LSOA (Welsh Government 2011). The income deprivation sub-domain was used instead of the global measure of deprivation (WIMD), as the global measure included data on a number of area-wide health indicators and information on accessibility to physical recreation facilities, which could dilute the analysis and thus undermine the robustness of our findings.

Cost data

A telephone survey was conducted to obtain cost data for all gyms and fitness centres (n=327) in Wales. The survey was executed over a two-week period in November 2011 and generated data for 280 facilities, a response rate of 86%. Data corresponding to three payment options were collected. First, pay-per-use; the cost of using the facility on a one off basis having made no prior payments. Second, monthly; the cost of one month's

membership with no tie-in, based upon the cheapest available option (direct debit, or cash in the absence of a direct debit option). Third, annual (including fees); the total membership price for a contract of twelve months, including other compulsory costs such as joining fees, induction costs or additional class/equipment fees.

Analysis

Facilities were categorised into publicly or privately provided facilities. Private facilities, consisted of commercial ventures and sports clubs; and public facilities were those provided by public sector organisations such as local authorities, health authorities and the ministry of defence. Facilities provided by charities, trusts, churches, community organisations and education institutions were excluded from the analysis as they were not routinely accessible to the general public. Differences in the cost of accessing facilities by quintiles of deprivation were determined by one-way analysis of variance (ANOVA). ANOVA assumes that variance in different groups is equal; the Levene test for homogeneity was conducted in each instance to ascertain whether or not this was the case. Where violations of this assumption occurred, more robust tests (Welch and Brown-Forsythe) were implemented. The accepted level of significance was $p < 0.05$, and analyses were conducted using SPSS v19.0 (IBM Corp, 2010). Analyses were undertaken for all facilities combined, and separately by public and private provision.

RESULTS

The mean cost of accessing facilities varied by payment option and ownership type, with private provision, on average, more expensive than public provision (see Table 1). Overall, publicly provided facilities offered a greater range of payment options, as fewer private facilities allowed access on a pay per use basis. Table 2 shows the mean cost of access by quintile of income deprivation by for all facilities combined, and for private and public provision. For all facilities there was a statistically significant negative relationship between neighbourhood income deprivation and mean cost for all payment options (pay-per-use, $p=0.002$; monthly, $p<0.001$; annual, $p<0.001$). These relationships were broadly linear with mean cost decreasing as neighbourhood income deprivation increased. The mean cost of accessing facilities was between 25.2% and 38.3% cheaper in the most deprived, compared to the least deprived, neighbourhoods.

When split by private and public provision a more variegated pattern emerged. For privately provided facilities there was a statistically significant negative relationship between neighbourhood income deprivation and mean access costs for all payment options (pay-per-use ($p=0.034$); monthly ($p=0.010$); annual ($p=0.007$)). For publicly provided provision there were no statistically significant differences by quintile of deprivation across all payment options. Figure 1 graphically represents these relationships and shows that the cost of access to facilities across all membership options declined as income deprivation increased for privately provided facilities, but remained broadly flat for publically provided facilities.

DISCUSSION

This study suggests that overall, the cost of accessing general purpose recreation facilities (gyms and fitness centres) was lower in more deprived neighbourhoods for all payment types. However, privately provided general purpose recreation facilities were more expensive than publicly provided facilities in less deprived neighbourhoods, but this cost disparity reduced as neighbourhood income deprivation increased.

The deprivation amplification hypothesis (Macintyre 2007) suggests that residents of deprived neighbourhoods are in 'double jeopardy', in that resources to live a healthy daily life may be more expensive and less available in deprived neighbourhoods. This hypothesis is supported by findings reported in a study undertaken in Western Australia (Arbel et al, 2009) where the costs of accessing physical activity resources were higher in disadvantaged areas. Our findings, in contrast, suggest that residents of deprived neighbourhoods in Wales are *not* at a cost disadvantage when accessing local physical activity resources compared to their more affluent counterparts, and that inequalities in cost by provider are eliminated in the most deprived neighbourhoods. Public providers appear to offer a universal pricing structure across the spectrum of neighbourhood deprivation, whereas private providers may be sensitive to the local socio-economic context and modify their prices accordingly. The pricing policies of private providers may not necessarily disadvantage residents of deprived neighbourhoods.

Study strengths include the high response rate to the telephone survey, and the use of a high quality sampling frame from SportWales. Limitations include a lack of access to data

that may confound reported associations including the quality, size, use and range of facilities, and the presence of subsidies provided by local authorities. We have no data on facility usage, and it may be that the closest facility may be in a neighbouring LSOA rather than within the analytical LSOA as residents of the facilities themselves may be close to LSOA boundaries. Information on whether even the lowest prices (public or private) were affordable for residents of deprived neighbourhoods was not available, and it is plausible that affordability rather than cost may be an important determinant of use for those on low incomes.

In conclusion, contrary to previous research, our findings from a national study in Wales suggest that residents of deprived neighbourhoods are *not* at a relative cost disadvantage when accessing general purpose neighbourhood physical activity resources. However important questions about relative affordability, rather than relative cost, should be explored in order to investigate whether neighbourhood differences in economic access to physical activity resources play a role in explaining the spatial patterning of physical activity.

REFERENCES

Arbel J., Wood L.J., Howat P., and Giles-Corti B. (2009). 'The class is always cheaper on the other side': socioeconomic discrepancies in the cost of using recreational facilities. *Annals of Leisure Research*, 12(1): 83-88.

Estabrooks P.A., Lee R.E. and Gyurcsik N.C. (2003). Resources for physical activity participation: Does availability and accessibility differ by neighbourhood socioeconomic status? *Annals of Behavioural Medicine* 25(2): 100-104.

Giles-Corti B., and Donovan R. (2002). Socioeconomic status differences in recreational activity levels and real and perceived access to a supportive physical environment. *Preventative Medicine* 35, 601-611.

Gordon-Larson P., Nelson M.C., Page P., and Popkin B.M. (2006). Inequality in the built environment underlies key health disparities in physical activity and obesity. *Pediatrics*, 117(2).

Hillsdon, M., Panter J., Foster C. and Jones A. (2007). Equitable access to exercise facilities. *American Journal of Preventative Medicine*, 32(6).

IBM Corp. Released 2010. *IBM SPSS Statistics for Windows, Version 19.0*. Armonk, NY: IBM Corp.

Jones, A.P., Bentham, G., Foster, C., Hillsdon, M. and Panter, J. (2007) *Obesogenic environment: Evidence review*. Working Paper. Office of Science and Technology.

Kavanagh, A.M., Goller, J.L., King, T., Jolley, D., Crawford D. and Turrell, G. (2005) Urban area disadvantage and physical activity: A multilevel study in Melbourne, Australia. *Journal of Epidemiology and Community Health*, 59:934-940.

Lamb K.E., Ferguson N.S., Wang Y., Ogilvie D. and Ellaway A. (2010). Distribution of physical activity facilities in Scotland by small area measures of deprivation and urbanicity. *International Journal of Behavioural and Physical Activity*, 7:76.

Macintyre S., Maciver S. and Sooman A. (1993). Area, class and health: Should we be focusing on places or people? *Journal of Social Policy*, 22: 213-234.

Macintyre S., and Ellaway, A. (1998) Social variations in the use of urban neighbourhoods: A case study in Glasgow. *Health and Place*, 4:91-94.

Macintyre, S. (2007) Deprivation amplification revisited; or, is it always true that poorer places have poorer access to resources for healthy diets and physical activity? *International Journal of Behavioural Nutrition and Physical Activity*, 4:32.

Macintyre S., Macdonald L. and Ellaway A. (2008). Do poorer people have poorer access to local resources and facilities? The distribution of local resources by area deprivation in Glasgow, Scotland. *Social Science and Medicine*, 67(6): 900-14.

Pearce J., Witten K., Hiscock R. and Blakely T. (2007). Are socially disadvantaged neighbourhoods deprived of health-related community resources? *International Journal of Epidemiology*; 36:348-355.

Powell L.M., Slater S., Chaloupka F.J. and Harper D. (2006). Availability of physical activity-related facilities and neighbourhood demographic and socioeconomic characteristics: A national study. *American Journal of Public Health*, 96(9).

Sundquist, J., Malmstrom, M. and Johansson, S.E. (1999) Cardiovascular risk factors and the neighbourhood environment: A multilevel analysis. *International Journal of Epidemiology*, 28:841-845

Van Lenthe F.J., Brug J. and Mackenbach J.P. (2005). Neighbourhood inequalities in physical inactivity: the role of neighbourhood attractiveness, proximity to local facilities and safety in Netherlands. *Social Sciences and Medicine* 60, 763-775

Welsh Government (2011) *Welsh Index of Multiple Deprivation 2011: Guidance on Use*. Statistics for Wales, Welsh Government.

Yen I.H., and Kaplan G.A. (1998). Poverty area residence and changes in physical activity level: evidence from the Alameda County Study. *American Journal of Public Health*, 88(11): 1709-1712.

Table 1 Cost of accessing facilities by payment option and ownership type

Payment Option	Ownership Type	N	Mean (£)	Standard Deviation (£)	Minimum (£)	Maximum (£)	Range (£)
Pay Per Use	Private	59	6.87	5.01	3.00	25.00	5.80
	Public	150	4.65	1.00	1.00	6.80	22.00
	All	209	5.28	2.96	1.00	25.00	24.00
Monthly	Private	95	36.76	14.11	14.95	75.00	60.05
	Public	151	28.74	4.80	15.00	45.00	30.00
	All	246	31.84	10.29	14.95	75.00	60.05
Annual	Private	97	462.29	187.30	179.40	1020.00	840.60
	Public	151	352.72	60.12	180.00	561.10	381.10
	All	248	395.58	136.75	179.40	1020.00	840.60

Table 2 Mean cost of accessing facilities by quintile of neighbourhood income deprivation, payment option and ownership type

Payment Option	Ownership Type	Neighbourhood Income Deprivation Quintile										<i>p</i> value
		1		2		3		4		5		
		N	Mean (£)	N	Mean (£)	N	Mean (£)	N	Mean (£)	N	Mean (£)	
Pay Per Use	Private	14	10.27	11	7.02	11	6.06	16	5.56	7	4.07	0.034
	Public	18	4.57	27	4.81	31	4.55	37	4.85	37	4.41	0.319
	All	32	7.06	38	5.45	42	4.95	53	5.07	44	4.36	0.002
Monthly	Private	22	45.23	23	36.94	18	35.83	18	31.87	14	30.61	0.010
	Public	18	29.80	28	28.39	30	28.53	39	29.43	36	27.90	0.566
	All	40	38.29	51	32.25	48	31.27	57	30.20	50	28.66	0.000
Annual	Private	23	577.83	23	454.95	18	449.65	19	408.01	14	374.47	0.007
	Public	18	365.45	28	350.26	30	351.04	39	359.74	36	342.07	0.643
	All	41	484.59	51	397.48	48	388.02	58	375.56	50	351.14	0.000

Figure 1 Equalisation of mean cost in access to facilities by neighbourhood income deprivation and payment option

