Multidisciplinary research in public health: A case study of research on access to green space

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Abstract

Objectives: Quantitative analysis of the physical and demographic parameters of access to Thames Chase Community Forest (TCCF), and how these have changed between 1990 and 2003; and qualitative exploration of our understanding of the links between health and the natural environment (TCCF), with a focus on the issue of ‘access’ to green space.

Study design: Multimethod design involving both quantitative (analysis of physical access to green space) and qualitative (ethnography) components.

Methods: Quantitative analysis, using geographical information systems, of physical access to the community forest; and ethnographic research including participant observation, non-participant observation, in-depth interviews and attendance at meetings and conferences.

Results: The quantitative analysis showed that public access to green space improved between 1990 and 2003 as a result of the regeneration and acquisition of new areas, and the average reduction in distance to green space was 162 m. However, such improvements were distributed differentially between population groups. In both 1990 and 2003, people from deprived areas and in poorer health had better access to green space than people from less deprived areas, but the greatest improvement in access to green space over this interval occurred in areas of below average deprivation (i.e. in the more affluent areas). The ethnographic research showed different interpretations of the notion of access. Use of TCCF was determined by a variety of factors including whether a person could ‘imagine themselves’ using such a space, different perceptions of what is actually being accessed (e.g. a place to exercise or a place to socialise), and ideas about using the countryside ‘properly’.

Conclusions: The health benefits of using a green space, such as TCCF, for walking or exercising are well recognized. However, whether people choose to use local green space may be determined by a variety of factors. These are likely to include physical distance to access of green space, as well as perceptions and understandings of what is being accessed and how it should be used. This study has also illustrated the ways in which multiple methods can be integrated in public health research, and the merits of different approaches to undertaking multidisciplinary work of this type.

The project

The case study for this paper is an investigation of the link between health (physical and mental) and the natural environment (a community forest). Over recent years, health policy in the UK has been increasingly advocating the use of outdoor green space to improve health,1–4 and in the environmental literature, there has been a growing emphasis on the health improvements connected with use of the natural environment.5–9 The authors were commissioned to investigate links between health (physical and mental) and green space (the natural environment) in the context of a national community forest.

The research project was part of an initiative called ‘THERAPI’ (Tackling Health through Environmental Regeneration and Public
Involvement), with its focus on the environment as a means to health improvement. THERAPI began as a 3-year project in 2002, based at the Thames Chase Community Forest (TCCF) Centre in Upminster, and operating within the London Borough of Havering and the London Borough of Barking and Dagenham. THERAPI was itself part of a broader national initiative called ‘REACT’ (Regeneration through Environmental ACTION), which was established by the Countryside Agency in 2001 to explore the application of the community forestry approach to environmental enhancement.

The research took place between 2003 and 2005, and combined two studies. The first was a quantitative study of the relationship between the community forest and the local population, focusing on physical access to green space. The second was an ethnographic qualitative study which explored access to green space, and the relationships between wellbeing and green space in the activities and accounts of those using the forest.

**Background: Thames Chase Community Forest**

TCCF is one of 12 national community forests which are situated around major towns and cities in England. TCCF was established in 1990 as one of the first three lead forests, and now covers 104 km² of land in east London and south-west Essex (Fig. 1). Community forests contain a mixture of land including woodland, farmland, meadows, nature areas and river valleys. The land may be owned by farmers, local authorities, nature conservation organizations and local businesses. A target for TCCF is to increase the woodland cover in the local area from 8% in 1990 to 30% by 2030. The TCCF Partnership Business Action Plan describes its aim as ‘... to use multi-purpose forestry to improve the countryside around towns and cities: restoring areas scarred by industrial dereliction, creating sites for recreation and sport, forming new habitats for wildlife, making outdoor classrooms for environmental education, and much more’.10

**The research**

The research involved two components, one quantitative and one qualitative. The first used geographical information systems (GIS) to characterize access to green space in distance terms, and how such access had changed between 1990 and 2003 as a result of the establishment of the community forest; and the second used ethnographic methods to explore the experiences of those living close to and/or using facilities of TCCF and specific THERAPI projects.

**Quantitative methods: physical access**

Physical access was analysed in terms of crow-fly distance from place of residence to the nearest access point of the community forest area. The underlying premise was that shorter distances would be associated with greater use of the community forest for recreation, and that such use would carry small but important benefits to physical and mental wellbeing. The literature on the multiple health benefits of recreational physical activity is extensive,11,12 but it was beyond the scope of this project to attempt direct quantification of those benefits (or of intermediate markers of them), or indeed to quantify the relationship between distance and recreational physical activity.

Analyses were based on small-area demographic and health data for 2001 Census Super Output Areas (SOAs) within the broader area around TCCF (Fig. 1). For each SOA, the 2004 Index of Multiple Deprivation (IMD), census statistics on the proportion of residents with limiting long-standing illness, and standardised mortality ratios were obtained.11,13

Areas of green space were defined as areas of land open to public access in 1990 and 2003, classified by the TCCF partnership and displayed in their published literature. The green space boundaries for 1990 and 2003 were compiled for use in a GIS format from digital land-use 1:5000 vector data (© Collins Bartholomew Ltd, 2004), printed Ordnance Survey 1:25,000 Explorer Series map (Sheet 175, © Ordnance Survey) and data collected by Global Positioning System during visits to the forest areas.

Using these boundaries, the following were calculated: (i) the straight-line (Euclidean) distance between the population-weighted centroid of each SOA and the nearest green space boundary; and (ii) the proportion of people living within 500 m of a green space boundary.

**Quantitative results**

As shown in Fig. 1, the TCCF area has a mixed sociodemographic profile, with areas in each quintile of the national distribution of socio-economic deprivation as measured by the 2004 IMD. Generally, deprivation and population density are higher in the west (towards London), although pockets of deprivation occur outside the M25. Out of the 199 SOAs, 10% were in the most deprived quintile of the national distribution of deprivation for England and 24% were in the most affluent quintile. The prevalence of limiting long-term illness varied in broadly similar distribution (data not shown).

From 1990 to 2003, public access to green space improved as a result of the regeneration and acquisition of new areas (Fig. 2). The average reduction in distance to green space was 162 m from 1.192 km to 1.030 km). In relation to short distance from green space, the percentage of SOAs whose population-weighted centroids were within 500 m of green space increased from 23% to 32% between 1990 and 2003. However, such improvements were distributed differentially between population groups. Area-level measures of socio-economic deprivation, limiting long-term illness and ethnicity in relation to access to green space in 1990 and 2003 are shown in Table 1.

In both 1990 and 2003, people from deprived areas and in poorer health had better access to green space than people from less deprived areas. On average, residents from the most deprived 20% of areas lived 260 m closer to a green space than residents in the least deprived 20% of areas. However, the greatest improvement in access to green space over this interval occurred in areas of below average deprivation (i.e. in the more affluent areas). Fig. 3 shows the change in the relationship between distance and deprivation. Not only do distances become shorter, but the gradient decreases as distances fall more for areas of low socio-economic deprivation.

Despite such differential change in access, there was a weakly negative correlation between access to green space and deprivation in 2003. On average, residents from the most deprived 20% of local areas were 260 m closer to a green space in 2003 than residents in the most affluent 20% of areas.

**Ethnography: methods**

The aims of the ethnography study were to contribute to our understanding of the links between health and the natural environment through research with individuals and groups using and living around TCCF in general, and more focused research on two selected THERAPI projects. More specific research objectives included: How do local communities conceptualize the relationships between the environment, physical and mental health? What are the barriers for specific groups of users in accessing the perceived benefits of green spaces, and how can these be addressed?2

The data sources for the ethnographic research were: policy documents; informal interviews with those responsible for managing TCCF and THERAPI projects; interviews and informal conversation with a range of users of the forest and THERAPI...
projects; interviews with the local population; participant observation of meetings, events and everyday life in TCCF; a demonstration day and four conferences on nature. These data were drawn from specific THERAPI case studies (programmes for people with mental health problems, and organized walks and work with two volunteer groups), as well as informal participation with professionals, forest users and the local population.

Ethnography: results

TCCF had multiple meanings for professionals and residents, and there were differences in how they conceptualized the relationships between wellbeing and green space. This paper reports the implications of the findings for understanding the issue of access. One motivation for this study was to identify ‘barriers’ to using the countryside generally, and TCCF initiatives in particular, and understanding ‘access’ is clearly key to this aim.

There are first some obvious practical issues posing challenges for access for local communities. These include potential barriers to physical access, such as lack of a car for those areas not well served by public transport. There are also barriers in terms of providing information about the facilities of TCCF, given the difficulties of distributing publicity materials to places where people will see them. However, this paper focuses on the more complex symbolic barriers that may restrict access or use.

Access – seeing yourself in the picture

One issue that resonated across the data was the way in which TCCF is constructed through professional practices as a particular
type of environment, in which particular types of behaviour are favoured, others made not so legitimate, and certain uses prioritized. One example comes from data on people’s reactions to a series of leaflets (entitled ‘Just Walk’) that were designed to encourage people to walk through the area, with advice on routes, points of interest and health benefits. Some respondents clearly ‘saw themselves’ in the leaflet, and found the information interesting. The leaflets resonated with their own views of who they were in the outdoor environment:

Yes I’m a countryside person – we used to do a lot of walking. I’d be comfortable joining the groups (Mother, works in husband’s business).

Yes, this is right up my street … just the mere thought of a walk in the countryside makes me feel emotionally uplifted (Property consultant).

Others, however, literally could not ‘see themselves in the picture’. This perception of exclusion might relate to the symbolic meanings of the ‘right’ equipment pictured (e.g., a Barbour coat), or to more overt exclusions such as those of ethnic diversity:

There’s no one Asian [in the pictures] – I’d be a bit passive, on the fringe, because it’s all White (Train passenger).

In a similar vein, some respondents reported that the pictures suggested purposeful activity that would make them, as possible forest users, feel inadequate, and the image of organized walks was problematic for some:

I don’t think it’s something I would do. I can’t walk very far, I’d feel uncomfy, I wouldn’t be able to keep up (Centre user).

What’s the worst thing you see about learning adisabled people? It’s their being led (Disabled activist).

Similarly, the focus on ‘safe’ walking was appealing for some, who liked the advice on routes and footwear, whereas others read this as condescending and likely to dissuade.

What is being accessed?

There are a number of modes of interacting with outdoor environments such as TCCF. Many users of TCCF in general, and the THERAPI projects in particular, stressed the benefits they experienced to physical and mental health from simply being in outdoor space:

Yes, I certainly feel better for being out there (THERAPI client).

[It’s] a place to get away from your troubles (THERAPI group member).

Such views resonate with policy versions of environment utilization, based on either quiet contemplation (the outdoor environment is valued because of its tranquility, and the low-key contrast to urban overstimulation) or purposeful activity. This chimes with the professional perspective of the inherent, and even obvious, benefits of outdoor space:

Access to the countryside, going to a park, it’s good for us. To me that’s common sense (Environmental practitioner).

Table 1

<table>
<thead>
<tr>
<th>Area within 500 m of 1990 TCCF boundaries</th>
<th>Area within 500 m of 2003 but not the 1990 TCCF boundaries</th>
<th>Area further than 500 m from the 2003 TCCF boundaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index of multiple deprivation:</td>
<td>Index of multiple deprivation:</td>
<td>Index of multiple deprivation:</td>
</tr>
<tr>
<td>median (interquartile range)</td>
<td>median (interquartile range)</td>
<td>median (interquartile range)</td>
</tr>
<tr>
<td>20.355 (16.23)</td>
<td>13.41 (14.04)</td>
<td>13.98 (18.06)</td>
</tr>
<tr>
<td>Percent of resident population of</td>
<td>Percent of resident population of</td>
<td>Percent of resident population of</td>
</tr>
<tr>
<td>following ethnic origins</td>
<td>following ethnic origins</td>
<td>following ethnic origins</td>
</tr>
<tr>
<td>South Asian</td>
<td>1.5%</td>
<td>2.08%</td>
</tr>
<tr>
<td>Afro-Caribbean</td>
<td>2.74%</td>
<td>1.97%</td>
</tr>
<tr>
<td>Other</td>
<td>0.65%</td>
<td>1.05%</td>
</tr>
<tr>
<td>Percent of resident population under 5</td>
<td>Percent of resident population under 5</td>
<td>Percent of resident population under 5</td>
</tr>
<tr>
<td>years of age</td>
<td>21.91%</td>
<td>20.24%</td>
</tr>
<tr>
<td>Percent of resident population with</td>
<td>Percent of resident population with limiting long-standing illness</td>
<td>Percent of resident population with limiting long-standing illness</td>
</tr>
<tr>
<td>limiting long-standing illness</td>
<td>18.23%</td>
<td>15.63%</td>
</tr>
</tbody>
</table>

* Data for Columns 1 and 2 are exclusive.
However, other modes of interacting with outdoor space were evident. One could be termed ‘the spectacular’, reflected through the suggestion that a considered use for TCCF had been as a theme park. Although this was reported by professionals as an extreme example of an inappropriate type of use, a key motivator for many people to get out into green environments was to be entertained, to have something interesting to look at, or to have the potential for social interaction. In contrasting TCCF with other spaces, for instance, one local resident said:

Victoria Park in Hackney, for instance, is a lovely place to walk—it’s beautifully laid out, with water features, birds and animals, there’s a loo somewhere, somewhere to have coffee, there’s usually lots of people, playing football, or having a picnic ... maybe you need a bit of shelter when it rains (Local resident).

Parts of TCCF appeared bleak and did not mesh with some people’s more spectacular concept of what was appealing about the outdoors, which had to at least promise excitement, interaction or the novel. Although few would probably want a theme-park-type facility, the relative lack of the types of services and attractions identified as positive by the spectacle seekers (such as a café, barbecue facilities or public art) made parts of TCCF symbolically inaccessible places.

Access: using the countryside ‘properly’

A final theme of symbolic access relates to the moral content of environment-related policy, captured in a motto of one of the TCCF centres: ‘Go on, go and explore the countryside properly’. Issues of decorum are obviously important when social space is shared, and inculcating ‘mores and manners’ (as one young volunteer put it) was at the heart of the social skills training in some of the THERAPI groups. However, while some inappropriate uses might be clear cut, such as setting the grass alight, the issue of what constitutes proper use of the countryside is complex.

Less legitimate use of the outdoors was not just signalled in publicity materials, but also encapsulated in the jocular, or cynical, reactions of professionals to the behaviour of some users of the facilities (e.g. using a laptop while in the forest, reading a newspaper whilst just sitting in a car in the car park, smoking). Perhaps most notably, one worker was upset by the disruptive, and inappropriate, noise made by a visiting educational group:

It’s the kind of noise they make ... they could just as easily do this in their back garden. They could use this as a resource, but they don’t – it’s undisciplined.

Discussion

The results of the epidemiological analysis can only provide indirect evidence about the potential bearing of TCCF on health and wellbeing. The data show that people from more deprived areas and of poorer health tended to have better access to the green space of TCCF than those from less deprived areas. Between 1990 and 2003, the increased number of TCCF sites open to public access improved overall, but improvement in access distance was greater for affluent areas than for deprived areas. This raises the issue of potentially widening health inequalities.

Such evidence about improved access does not, of course, provide direct evidence about change in use of TCCF, and still less about its impact on health and wellbeing; the reasons why people use green space for physical activity are multifaceted. However, access is an important factor, and if there is increased use of green space, and hence increased physical activity, there is a body of epidemiological and other evidence to suggest that significant impacts on health should follow. Increased physical activity is likely to have benefits in terms of suppleness, strength and stamina, cardiovascular function and risk, reduced obesity and improved glucose metabolism, mental health and well-being, and bone and joint strength (long term).

Measuring access to green space and its effects on health is complex. Evidence about the links between the environment and physical activity is still limited and in need of conceptual and methodological development. Access and use are determined by more than physical proximity. The size, attractiveness and appropriateness of the green space are likely to be important, and personal perceptions of safety and many other factors may modify the effect of physical parameters. In addition, proximity itself is more than simple Euclidean distance. The paths used to access green areas may be quite different from direct line of sight; busy roads, fences and other obstacles often present significant barriers. The mixed evidence that has been published to date about the relationship between access to green space and physical activity may, in part, reflect the limited specificity of measurement, both in relation to explanatory factors (the dimensions of access) and health behaviours.

The statements above are supported by the ethnographic findings, which suggest that access is more than geographical distance. The ethnographic research unveiled multiple meanings and interpretations of TCCF, with a range of professional and local uses of the term. Different people tended to conceptualize the forest and its relationship to health in different and changing ways. The importance placed on outdoor space and use of the natural environment varied between individuals, and it was not a priority for all. Consideration of the health benefits of the outdoors was also not a significant determinant for many when contemplating whether to use TCCF.

‘Access’ in the accounts of TCCF users and local residents was a complex issue that related not just to the physical (and measurable) elements of access, such as distance to green space or availability of public transport, but more significantly to less tangible and more symbolic meanings, as in other research. These are likely to relate to the sociodemographic variables utilized in the epidemiological study in complex ways. The contrast, for instance, in the ‘contemplative’ and ‘spectacular’ orientations towards green space are likely to relate to the ways in which urban residents shape their social class or ethnic identities. These findings are important to recent policy initiatives around improving access to, and use of, green space.

Multiple methods research in public health

Yach suggested that community health research used to be more naturally integrated, but after the Second World War, several
factors led to disciplinary separation: the growing establishment of the disciplines of epidemiology, ethnography and sociology; separate funding streams for different disciplines; and the dominance of the medical profession within public health, with its emphasis on quantitative methods.55

Any study drawing on more than one method or discipline now tends to be called ‘multidisciplinary’.56 There are, broadly, two concepts of multidisciplinary research. The first can be called interdisciplinary (or transdisciplinary) research, in which research disciplines are integrated from the outset. The second, and more common, approach in contemporary public health is multimethod research, in which different methods run concurrently.

In more mainstream public health work, trans- or interdisciplinary research involves integrating the different methodological approaches and working, literally, between the disciplines. As Green and Thorgood point out, the aim in such endeavours is to ‘integrate the different theoretical and methodological insights from each discipline throughout the project, rather than at the point of combining the findings’.57

In this project, the authors were unable to adopt an interdisciplinary framework, in that the two component studies remained separate; instead, a form of multiple methods research was adopted. It may be that true interdisciplinary work is better suited to large-scale, or macro, theoretical study, which allows questions at a higher level of social organization (e.g. the effects of globalization on health), and requires working across disciplines to avoid the implicit reductionism in unidisciplinary work. Within the authors’ research group, the divergence of academic expertise meant that discussions inevitably returned to different ways of seeing the world.58,59

A fundamental challenge of this project was the epistemological one of integrating quantitative mapping and ethnographic work, that is of combining, in some meaningful way, sets of data that address different conceptual questions, even if they relate to the same broad topic. Within multiple methods research, there are, crudely, three potential models describing how such data sets are typically combined.

The first approach would ascribe logical primacy to the quantitative framework. This could involve taking the maps described in the quantitative work, and then using the ethnographic case studies to provide qualitative data on the ‘meaning’ of relationships that had been predetermined by existing categories (socio-economic status, mental health status, distance from green space). With the notion of access to green space, adopting such an approach would have meant using the quantitative work to determine the important aspects of access, then exploring these in more depth with the ethnography. Had this been done, the study would have been directed towards issues of distance from entry points to green space, and possibly to relationships between deprivation and how this might impact on ability to access to green space.

The problem with this approach is that it potentially misses the real contributions likely from the ethnography if the data are relegated to ‘checking out’ or ‘commenting on’ relationships already imagined. The strength of qualitative methodologies lies in their power to elucidate the meaning of phenomena and to suggest new ways of thinking about them. Ethnography has a value in disrupting ‘taken for granted’ assumptions (e.g. that the environment is a ‘good thing’) and reshaping others (e.g. there are only certain ways of benefiting from the countryside). Giving primacy to the quantitative approach would have limited how far the study would have uncovered the more symbolic barriers that influence people’s access to the forest.

Conversely, one can logically start with the findings from the ethnographic work, and then use maps to generalize or test possible relationships between the phenomena described by the ethnography. In practical terms, this would have been rather difficult for this project, as it would have involved waiting for the ethnographic work to be complete before beginning any of the quantitative work. However, if the authors had started in this vein, the ethnographic findings might have directed the study towards more detailed quantitative work on local variations, in demography and health, between different ethnic groups; or towards a more comprehensive quantitative questionnaire survey of users of TCCF that asked about barriers to use and perceptions of how the forest should be used.

Pragmatically, this study adopted a model of utilizing the different methods in parallel, addressing the same broad topic but using different conceptual frameworks. The authors believe that the richness of the study findings reflects the benefits of this approach to multimethod research. Quantitative data provide the type of evidence favoured by policy makers, with quantifications of measures of access such as distance to green space in different social groups. However, more qualitative evidence is also needed in order to unpack what those different social groups mean in the context of a particular policy problem (in this case, use of outdoor space).

The challenge, of course, is that in unpacking the meanings and specifying how social class identities (for instance) might be shaped to some extent by one’s use of outdoor space, new questions are generated that require epidemiological answers using new variables. How could one measure, for instance, orientations towards a ‘spectacular’ mode of interacting with the forest?

In a short-term project, there is little capacity for moving back and forward between the epidemiological and anthropological frameworks, and using the interplay to refine the research questions. Attempting two components in parallel was the default option for the present authors. However, even in a short-term project, utilizing interpretations from two epistemological frameworks enabled the phenomenon of ‘access’ to be described in more depth, and the continued compartmentalization of public health research to be challenged.

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Ethical approval

London School of Hygiene and Tropical Medicine Ethics Committee.

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Competing interests

None declared.

References
