Building HIA approaches into strategies for green space use: an example from Plymouth’s (UK) Stepping Stones to Nature project

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SUMMARY

The health and well-being benefits of access to green space are well documented. Research suggests positive findings regardless of social group, however barriers exist that limit access to green space, including proximity, geography and differing social conditions. Current public health policy aims to broaden the range of environmental public health interventions through effective partnership working, providing opportunities to work across agencies to promote the use of green space. Health Impact Assessment (HIA) is a combination of methods and procedures to assess the potential health and well-being impacts of policies, developments and projects. It provides a means by which negative impacts can be mitigated and positive impacts can be enhanced, and has potential application for assessing green space use. This paper describes the application of a HIA approach to a multi-agency project (Stepping Stones to Nature—SS2N) in the UK designed to improve local green spaces and facilitate green space use in areas classified as having high levels of deprivation. The findings suggest that the SS2N project had the potential to provide significant positive benefits in the areas of physical activity, mental and social well-being. Specific findings for one locality identified a range of actions that could be taken to enhance benefits, and mitigate negative factors such as anti-social behaviour. The HIA approach proved to be a valuable process through which impacts of a community development/public health project could be enhanced and negative impacts prevented at an early stage; it illustrates how a HIA approach could enhance multi-agency working to promote health and well-being in communities.

Key words: health impact assessment; green space

BACKGROUND

Neighbourhood attachment, civic participation and community networks are suggested by Li (Li, 2007) as psychosocial indicators of health and happiness. Within this context, the building of self-esteem and resilience is a multidisciplinary function of public health, health promotion and developing social capital. Popay et al. (Popay et al., 2004) assert that public health work must take place in ‘local health systems’ that cross traditional discipline boundaries and widen the scope of professional practice; environmental interventions for public health improvement are increasingly relevant. In support, Cosco’s (Cosco, 2007) evidence-based analyses demonstrate the relationship between access to green space and the healthy development of children; Takano et al. (Takano et al., 2002) show how older people’s survival and longevity...
improves if they stay within their local community and participate in daily walking activity in the local outdoor environment.

Current public health policy aims to broaden the range of environmental public health intervention through effective partnership working (Worpole, 2007). The use of green space offers significant environmental resources that improve the individual experience of health and quality of life (Aspinall, 2007; Hartig, 2007). However, the differing social conditions that give rise to access and use of green space reflect the local geography of persistent health inequalities. To measure the health benefit of access to green space in socially deprived areas Pinder et al. (Pinder et al., 2009) used a mixed methodological and multidisciplinary approach. A qualitative conceptual analysis aimed to explore the relationship between community perceptions of health, the environment and the relationship between them. Their study confirms the difficulties of deriving a clear relationship between social and physical variables and suggests how access to green space is a process, rather than an event; health benefits of using green space for walking and exercise are established but improving access to green space is determined by a complex range of psychosocial factors. These include physical proximity to green space as well as perceptions and understanding of what is being accessed and how it should be used. Prior research on green space use describes the subtle nature of social inclusion and exclusion in ‘playful’ open spaces, demonstrating the differing social means through which poorer communities persistently experience health inequalities (Travlou and Ward-Thompson, 2007; Ward-Thompson, 2007).

Increasing levels of physical activity and the reduction of obesity are high on the public health agenda, with recommendations that every adult should accumulate 30 min or more of moderate-intensity physical activity on most, preferably all, days of the week (Pate et al., 1995). A number of initiatives have been implemented to encourage participation in exercise. For example, the Department of Health Local Exercise Action Pilots (LEAP, 2010) are locally run pilot programmes in the UK to test and evaluate new ways of encouraging people to take up more physical activity. Case studies show that participation in green exercise (physical activity outdoors) can significantly improve self-esteem; self-esteem was significantly correlated with an individuals’ body weight (Pretty et al., 2005). A report by MIND (MIND, 2007) of two small studies of green exercise activities indicated that participation in green exercise improved levels of confidence, self-esteem and lifted mood.

Nature in an urban environment can be a source of positive feelings and fulfil important immaterial and non-consumptive human needs; as well as increasing physical activity, green spaces can have a restorative function, thereby promoting relaxation and reducing stress (Chiesura, 2004). Parks are also a means of bringing different communities together, and have the potential to enhance social contact (Dines et al., 2006). Despite positive perceptions of green space, a number of studies suggest barriers to the use of green space include fear of violence, concerns about safety, anti-social activities such as dog fouling, graffiti, vandalism and poor maintenance (Glaser, 1994; Bell et al., 2004; Ward-Thompson et al., 2004). Nielsen and Hansen (Nielsen and Hansen, 2007) found that access to a garden or short distance to a green space was associated with less stress and lower likelihood of obesity. This distance effect was also demonstrated by Giles-Corti and Donovan (Giles-Corti and Donovan, 2002). In contrast Witten et al. (Witten et al., 2008) and Hillsdon et al. (Hillsdon et al., 2006) found no evidence of an association between neighbourhood access to parks and physical activity and body mass index.

Studies published to date, such as those cited above, tend to be cross-sectional with limited long-term follow-up or assessment in changes in behaviour over time. Furthermore, where studies have evaluated an intervention, the focus has been on relatively healthy people participating in physical activities (Lamb et al., 2002; Pretty et al., 2005). Croucher et al. (Croucher et al., 2007) conducted a critical literature review of 87 studies, examining the links between physical health, health behaviours, mental health and general well-being, and social health and different aspects of green space. The findings suggest a positive relationship between general health and green space regardless of socio-economic status. Croucher et al’s review, commissioned by Green Space Scotland, contributed to the development of a Health Impact Assessment (HIA) Guide for urban green space (Green space Scotland, 2008). This guide includes case studies that illustrate how HIA can be used in policy contexts and practice settings. For example, one case study considered green
space health impacts in a spatial plan. Another examined ways to increase health gain from the management of green space and outdoor leisure facilities including cycle paths and community spaces; the findings suggested that allotments increased access to affordable food and increased opportunities for social cohesion.

HIA can be described as:

‘...the process of identifying the future consequences of a current or proposed action’. That adopts 'a combination of procedures, methods, and tools by which a policy, programme or project may be judged as its potential effects on the health of a population, and the distribution of those effects within the population. HIA identifies appropriate actions to manage those effects' (Birley, 2011 p.2).

A significant variety of HIA tools exist, and approaches vary, reflecting their differing origins (Mindell et al., 2008). Earlier approaches tend to focus more on environmental hazards and risks. However, there is growing consensus that making HIA integral to policy-making can raise awareness of the potential health impacts of policies and how they can be improved (Mindell et al., 2008). Taylor et al. (Taylor et al., 2003b) provide examples of how a HIA can influence the decision-making process and demonstrate how the process helped to articulate community concerns and promote dialogue amongst key stakeholders.

This paper describes how a HIA was applied to a project aiming at facilitating access to green space. Stepping Stones to Nature (SS2N) is a 4-year project that commenced in October 2009. The project provides a unique opportunity to instigate a significant and sustained change in the way people of all ages and backgrounds use and perceive natural spaces within and around the city of Plymouth (UK). Plymouth has outstanding natural resources; a third is designated as green/blue space with large harbour and extensive accessible coastlines as well as parks, woodlands and open green spaces; the city is surrounded by exceptional and protected natural environments. Despite these assets, there are physical accessibility and perceptual barriers that prevent people from using these spaces. The SS2N project aims to address these issues through significant improvements in green space quality and an extensive and innovative community involvement programme. The project is designed to build skills and confidence in local communities so that they can contribute to consultation about the design of local green space through community engagement. The approach aims to build peoples’ confidence in accessing local areas of green space before taking them on to the next step of visiting green space outside of their comfort zone. Fundamental to SS2N is engagement with the local community. The project requires multi-agency partnership working with a wide range of organizations in order to help them achieve their objectives (and health and well-being benefits) through improvements in green space. The SS2N project supports the Plymouth Green space strategy; it builds on the Plymouth Joint Strategic Needs Assessment that has been identified as a priority improving access to physical activity opportunities in defined geographical areas and for defined population groups (for example, young people).

Plymouth’s health is described as ‘generally worse’ than the national and regional averages in the Plymouth Health Profile (APHO, 2010). Health inequalities are particularly marked when compared regionally and even nationally. Health inequalities are concentrated in the most socio-economically disadvantaged neighbourhoods, some of which have been identified as priority areas for the SS2N project. A person born in a ‘materially deprived’ neighbourhood of Plymouth can expect to develop a life-threatening disease earlier than if they were born in a more prosperous neighbourhood.

There is a close association between the neighbourhood pattern of multiple deprivation in 2007 and the distribution of ‘vulnerable families’ across the city in 2008. MOSAIC market segmentation information suggests that vulnerable families are most likely to be found living in social housing, usually on estates, in deprived areas with uncertain employment prospects. The most vulnerable families are likely to be living in the upper floors of social housing apartments, or will be single parents in deprived social housing. The rates of participation in

1 MOSAIC
MOSAIC is a consumer segmentation resource provided by the limited company Experian® that allows the lifestyle classification of a postcode based upon the patterns of private income and expenditure. It is used extensively by the retail industry to aid service and financial planning and has been adapted for use by public sector agencies. From the NHS Plymouth Public Health Development Unit Health Visitor report, 2008.
sport and active recreation levels are believed to be slowly improving, but progress is uneven with certain groups believed to be not participating, including people from materially deprived backgrounds (especially, women and girls), people with disabilities and people aged over 50 years. Overall, ~11 000 Plymouth residents are estimated to be affected by some form of mental health condition. Modelling suggests that 3559 residents aged 65+ years are likely to be suffering from depression, with 1119 suffering from severe depression in 2009.

### Table 1: Summary of SS2N proposals

<table>
<thead>
<tr>
<th>Key SS2N outcomes</th>
<th>Project components</th>
<th>Examples of key project activities (as planned in December 2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Inclusive Participation and improved (access) opportunities...A greater diversity and number of people have improved opportunities to experience the natural environment</td>
<td>(1) A focus on disadvantaged people/groups; (2) Changing perceptions of accessing green spaces; (3) Increasing opportunities to access green spaces; (4) People learning about the natural environment; (5) People gaining new skills; (6) An increase in communities’ sense of ownership of local natural places</td>
<td>- Community engagement activities - Identify and respond to community needs/wishes - Longer term community use/management - Green space activities including festival - Localized events on green spaces - Trips to next steps for target groups - Dedicated project officers to coordinate</td>
</tr>
<tr>
<td>(ii) To facilitate lasting Organizational Change</td>
<td>in the way green space managers and community and health professionals work together. The project aims to establish a unique partnership to bring together expertise from public health, parks, protected landscapes, neighbourhood renewal, play, rights of way and outdoor education.</td>
<td>- Mainstreaming the coordinated working of different agencies re green space access - Dedicated project officers to coordinate</td>
</tr>
<tr>
<td>(iii) Quality improvements</td>
<td>that ensure natural spaces are more welcoming and accessible both physically and virtually (i.e. more people are able to enjoy the natural environment through investment in access to natural places and networks between sites</td>
<td>- Two new natural play spaces - new and improved quality paths - Six green spaces in deprived neighbourhoods benefiting from access improvements - Green flag standard achieved on more sites - CABE spaceshaper tools utilized - Dedicated project officers to coordinate</td>
</tr>
<tr>
<td>(iv) Communications</td>
<td>About accessing natural spaces (including via high profile community-led events)</td>
<td>- Dedicated project officers to coordinate</td>
</tr>
<tr>
<td>(v) Research</td>
<td>Report the benefits and changes evoked by this unique project.</td>
<td>- Dedicated project officers to coordinate</td>
</tr>
</tbody>
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**Aim**

The overall purpose of this HIA was to understand the potential health and well-being impacts of the SS2N project in order to help decision-makers to alter plans as they judge necessary (Taylor et al., 2003b).

The specific objectives of the HIA were:

To assess the prospective health and well-being impacts of the overall SS2N project (assessment of policy).
To assess the prospective health impacts of the SS2N actual and planned interventions in the Forder Valley Local Nature Reserve (assessment of special improvement plans).

To identify actions to mitigate potentially negative effects and enhance potentially positive effects of the project.

METHODS

The HIA of the SS2N project considered the aims of the project in the context of the wider determinants of health (Orme et al., 2007) and with a view to tackling inequalities in health (Taylor et al., 2003a). This SS2N HIA (conducted through March and April 2010) can be described as a ‘rapid’ HIA, applying a range of iterative approaches, which are summarized below. The HIA identified potential benefits in the areas of physical, social and emotional well-being through the application of a reporting framework (see Supplementary Material, Table S1 for example) that highlighted areas of enhancement for positive effects, and mitigation for negative effects.

Stages of the HIA

**Scoping**
- summarizing the SS2N proposals (see Table 1);
- producing a brief profile of local population health;
- conducting a rapid review of the relevant evidence bases (published literature on health and well-being impacts of green space);
- scoping of the key issues arising to focus the assessment and
- Collating appropriate evidence for use in the HIA workshop (see Table 2).

**Assessment**
- Based on a rapid review of the evidence base, and professional experience, the authors devised an HIA tool for use during workshop discussion and subsequent analysis. It was agreed that the prospective health impacts related to SS2N could be divided into the three core types of physical, mental and social health impacts.

**Reporting and monitoring (ongoing)**
- Regular reports were given to the overall SS2N Steering Group.
- A draft report of the HIA was circulated to stakeholders, including decision-makers.
• Review of the HIA process and outcomes was undertaken at a SS2N research working group meeting.
• This was followed by production of a final HIA report.

Summary of SSN proposals
Plymouth is the largest city in the West Country and is surrounded by national parks and protected environments. However, evidence gathered locally through Council surveys suggests that many socio-economically disadvantaged groups in the city rarely access these environments. This is a key driver of SS2N, and the overall vision of the project is to improve access to green space in and around the city so that people experience the wide ranging benefits of accessing nature. The project envisages a stepping stones process, by which people begin by accessing local urban green spaces (particularly in areas of high deprivation), for example, encouraging local communities to participate in activities within these spaces. The intention is for this participation to help people to build confidence and interest in accessing natural areas (within the city but outside of the individuals’ ‘comfort zone’), thus motivating people to move beyond the city to experience the natural environments that surround the city.

FINDINGS: IMPACTS OF: (1) SS2N POLICY; (2) SS2N PLANS FOR FORDER VALLEY

Impacts of SS2N policy
Based on an assessment of the SS2N proposal document [E1] four key health impacts were identified: physical health and activity; mental well-being; social well-being; and physical injury.

Physical health and activity
SS2N provides the potential for improved physical activity and exercise through the involvement of people of different ages in a range of play and leisure activities. Specific groups will be targeted, and there is a clear intention to provide ‘stepping stones’ from green spaces in close proximity to residential areas to spaces further afield and beyond the city. The provision of cycle routes and improved signage should facilitate this. These positive pathways can be enhanced through the engagement of social work and public health professionals who can ‘refer’ to activities and use the spaces proactively for health and well-being promoting events. Access can be improved by involving transport planners at an early stage of the project, and by actively encouraging people to use the spaces.

A potential negative impact is that encouraging greater green space use might result in increased physical injury. However, this can be reduced through appropriate approaches to health and safety. Furthermore, enhanced opportunities for outdoor play have the potential to allow young people to increase their spatial awareness and skills for engagement in outdoor activities (http://www.rethinkingchildhood.com/).

Mental well-being
The pathways that provide opportunities for improved mental health and well-being are through activities that build skills and confidence, encourage relaxation and creative endeavours, and facilitate access to and engagement with the natural world. This can be strengthened through the involvement of local groups, such as youth groups, supporting people through linked training and skills building events, and the support of mental health professionals. Conversely, fear of crime or exclusion may be overcome through assessment of perceptions and encouraging greater access to green spaces through supported events. Furthermore, perceived risk may increase as additional people use the space as a result of the SS2N project, possibly upsetting those who were quietly using it on their own before. Managing the competing demands and perceptions of different population groups is an anticipated consequence of bringing different groups together to share their social experiences of local green spaces.

Social well-being
Community engagement activities provide significant opportunities for improving social well-being. Events will target different communities as well as creating opportunities to bring diverse groups together. For example, establishing a ‘friends of’ group that brings together local residents to support the space and activities. The potential negative impacts such as conflict between groups using the same green space could be reduced through pre-emptive work with youth
and residents groups, and events that build positive relationships across generations.

**Impacts of SS2N plans for Forder Valley**

Impacts reported here are based on an assessment of the SS2N project planned physical and social developments for a specific site in Plymouth. Forder Valley is a wooded valley nature reserve that sits between the two adjacent areas of mixed social need with high levels of income disparity between the unemployed, and the ‘blue collar’ workers engaged in local urban enterprise. Population demographics suggest that children and young families, the retired and elderly, and single income households predominate. Local crime and public health statistics reveal some social problems with drug and alcohol abuse, which appears marginally higher than the local and national average.

**Physical health and activity**

The planned improvements to access the Forder Valley site could lead to increased physical activity and exercise. Improvements in the physical space will make the area more accessible by providing cycle paths and disability access; improvements in play areas will make the area more attractive to young children and families. Access will also be promoted through increased awareness of the site by improving signs and providing a range of activities. Providing access to pleasant outdoor space in close proximity to homes can increase physical activity, and lower the risk of obesity and stress (Nielsen and Hansen, 2007). Enhancement will be through community engagement. In particular, health and social work and public health students could produce an action plan to identify and engage ‘missing’ groups.

**Physical injury**

The potential negative impacts are predominantly injury and accident due to poor maintenance of equipment and unstructured play such as climbing trees. Mitigation will be via enhanced health and safety signing, ongoing maintenance of equipment (low maintenance equipment). Crime and anti-social behaviour can be mitigated through supervised ‘clean-up’ events, increased use of the space by different groups and emphasizing the positive aspects of green space use. The risk of environmental factors such as increased exposure to sun and diseases carried by wildlife can be managed through education, signage, creating shelters and management of the site.

**Mental well-being**

Fear of personal safety due to lack of confidence in using green space and possible poor visibility (the site is very wooded) could be mitigated by opening up the site, improving entrances and encouraging community use of the site. Conversely, mental health and well-being could be enhanced as the site will provide space for relaxation and restoration. It could contribute to lower stress through increased use of outdoor space and engagement with nature. Community engagement activities will provide opportunities for individuals to meet new people and form friendships, through, for example, getting involved in friends’ groups.

**Social well-being**

The developments to the site and the associated community activities are designed to promote an investment in identity with the green space. Events and ‘celebrations’ will bring together different age groups, thus providing opportunities to enhance social cohesion. However, there may be conflict between groups over the use of the space, with different needs and possible issues regarding personal safety. Significant work with youth forums and providing opportunities for intergenerational projects will help to build positive relationships.

**Examples of decision-making and partnership working using the HIA evidence**

The HIA process had a significant effect on key decision-making through the early stages of implementation of the SS2N project as a whole. It served to highlight the importance of working with a range of partners to engage communities, thus leading to the development of a research project focusing on the process of partnership working. It enabled the SS2N project team to evidence the project’s impact to gain additional funding from Natural England to increase ‘Walking for health’ in green spaces in and around Plymouth, and provided appropriate evidence for inclusion in reports to support the project approach to community engagement.
The HIA evidence influenced the implementation of the project in Forder Valley in a number of ways. Mitigation measures implemented as a result of developing the HIA assessment and enhanced partnership working were:

- Partnering with local children’s centre to build capacity to deliver nature walks on site to improve physical health of children and families;
- Providing a programme of family summer activities on site to encourage natural play;
- Providing health and safety signage next to water play features to minimize physical harm;
- Community clean-up days on site with refreshments provided as an opportunity to socialize;
- Developing relationships with local members of the community and responding promptly to enquiries and complaints to ensure people felt their voices were heard and acted upon; and
- Supporting the set up of a friends’ Group to enable more community ownership and management of the site.

The project team found that collating evidence for the HIA was a useful process to go through in terms of recognizing the breadth of health and well-being that the project could offer. However, there was a recognition that this was a rapid HIA and therefore local information was not as detailed as it could have been.

**DISCUSSION**

In order to deliver the potentially wide ranging health benefits of the SS2N project, there is a strong need for effective partnership working to target groups most at risk of inequalities. Working together on the HIA enabled discussion of potential health benefits of green space amongst different professionals; illustrating, for example, how community development can enhance health and well-being. In addition, the practical application of mitigation or enhancement measures highlights the need for long-term buy-in from partners and the local community, together with good coordination. In order to sustain the changes, a clear aim of the project should be to influence policy makers and integrate green space health benefits into all areas of policy/practice. New partnerships have been formed, and the learning from this HIA has the potential to influence other local projects.

Appropriate dissemination of this HIA is ongoing through the SS2N Steering Group and other relevant organizations, and the findings are being used to inform consultation with community groups. The HIA of Forder Valley will be repeated 12 months in order to assess the extent to which the findings were implemented; this HIA approach will also be used for another location within the SS2N project. Challenges remain in evidencing the actual impact of the SS2N project on health and well-being and its value for money. However, repeating the HIA provides an opportunity to examine how efforts to enhance or mitigate impacts were achieved.

The SS2N project can be regarded as including key explicit and implicit aims to promote health and well-being and to contribute to reducing health inequalities. Furthermore, this example supports previous work and provides a further rationale for the use of HIA approaches to help to maximize the positive health impacts of green space initiatives (Green space Scotland, 2008). The HIA emphasis can be seen as highlighting health concerns and opportunities across the different dimensions of such projects.

It is important to retain a sharp focus on those target population groups most at risk of inequalities and less likely to engage in health improvement through natural spaces (Travlou and Ward-Thompson, 2007; Ward-Thompson, 2007). Targeted participation, authentic consultation and persistent outreach are all useful approaches for project staff and partners.

There is an increasing amount of evidence concerning how accessing natural spaces can affect physical, mental and social health (MIND, 2007; Pinder et al., 2009). It is also clear that the relationships between health and accessing green/natural spaces are complex and influenced by a wide range of factors. The application of the ‘health pathways’ approach used in this HIA can help illuminate such processes.

The HIA, arguably unlike some forms of research, specifically aims to influence decision-makers and decision-making (Taylor et al., 2003b). The HIA as a process should be able to fully engage as appropriate with the operational details and conflicts embedded within proposals such as this. The authors regard the SS2N HIA process to date as useful and constructive, but
limited in that it requires engagement with a far wider group of stakeholders in order to gain a multi-dimensional perspective.

This paper provides an example of how a HIA approach can be used to assess the health and well-being impacts of a green space initiative. This approach could be used to engage professionals from areas such as spatial planning, public health, environmental health and transport in assessing new development plans or spatial strategies early on in order to maximize positive effects and minimize negative impacts. Plans for the development of the National Public Health Service for England, bringing public health into Local Authorities are likely to provide opportunities to use HIA approaches to advance public health and address health inequalities and deliver Local Strategic Partnership targets. Furthermore, this approach provides opportunities for the development of more integrated working, thus providing value for money in economically challenging times.

SUPPLEMENTARY MATERIAL

Supplementary Material is available at Health Promotion International online.

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