Significant Spaces: Exploring the Health and Wellbeing Impacts of Natural Environments

Denise Hewlett, Debra Gray, Richard Gunton, Tom Munro, Sheela Agarwal, Martin Breed, Chris Skelly, Philip Weinstein, Ainara Terradillos, Natalia Lavrushkina, and Danny Byrne

10.1 Introduction

For decades we have seen much concern about a global epidemic of chronic, non-communicable diseases, with increasing recognition of the potential significant impacts on population health and wellbeing, quality of life, health systems and the economy (Egorov et al., 2016; WHO,

D. Hewlett (✉)
PeopleScapes Research & Knowledge Exchange Centre, Department of Responsible Management, University of Winchester, Winchester, UK
e-mail: denise.hewlett@winchester.ac.uk

Bournemouth University, Dorset, UK

D. Gray
PeopleScapes Research & Knowledge Exchange, University of Winchester, Winchester, UK
e-mail: Debra.Gray@winchester.ac.uk

2018, 2022a). There is a particular concern about our urban environments in which 55% of the world's population live: by 2050, this proportion is expected to increase to 68% (WHO, 2022b). This situation presents significant challenges for the 4.2 billion people living in cities, including: the increase in sedentary lifestyles in areas dominated by private car use and with inadequate public transportation, poor housing, inadequate sanitation, impacts of climate change and heat island effects (WHO, 2022b), environmental pollution, soil and water contamination, noise pollution and air pollution.

R. Gunton
Winchester Business School, University of Winchester, Winchester, UK
e-mail: Richard.Gunton@winchester.ac.uk

T. Munro
Dorset AONB, Dorset, UK
e-mail: tom.munro@dorsetcouncil.gov.uk

S. Agarwal
University of Plymouth Business School, Plymouth, UK
e-mail: s.agarwal@plymouth.ac.uk

M. Breed
Flinders University, Bedford Park, SA, Australia
e-mail: martin.breed@flinders.edu.au

C. Skelly
Department of Health and Social Care, London, UK

P. Weinstein
School of Public Health, Faculty of Health and Medical Sciences, University of Adelaide, Adelaide, SA, Australia
e-mail: philip.weinstein@adelaide.edu.au

A. Terradillos
Universidad de Sevilla, Andalusia, Spain

N. Lavrushkina
Faculty of Management, Bournemouth University, Bournemouth, UK
e-mail: nlavrushkina@bournemouth.ac.uk

D. Byrne
Independent Consultant, Hampshire, UK
e-mail: byrne729@btinternet.com

Indeed, as but one example, the World Health Organisation (WHO) has determined that 99% of the global population are breathing air that exceeds WHO guideline limits (WHO, 2022c). Within this context, nature—and more broadly, green space—are increasingly being considered as a key public health intervention, based on considerable evidence that such environments can be good for our health, and can play a substantial part in enhancing our quality of life. Since the 1960s, researchers have attempted to determine what has generally been assumed for millennia: that nature and greenness or *viriditas* provides benefits to public health and wellbeing, and that good, spatial planning designs can enhance these benefits (Dahlgren & Whitehead, 1991, 2021; Hancock & Perkins, 1985; Marcus & Sachs, 2014).

Access to green spaces has been associated with a range of improvements to self-reported general health, including lower prevalence of diagnosed morbidities, increased longevity, less premature mortality and more rapid recovery from illness (Mitchell & Popham, 2008; Rojas-Rueda et al., 2019; Van den Berg et al., 2015). Greener neighbourhoods are associated with improvements in outcomes across a range of common health conditions, including anxiety, depression, cardiovascular disease (CVD), stroke and diabetes, and are also correlated with better heart health (Aitken, 2021; Grazuleviciene et al., 2015) and generally better psychological wellbeing (Gascon et al., 2016; Gray et al., 2021; Houlden et al., 2018; Van den Berg et al., 2016). Moreover, there is some evidence that these can be particularly important for dealing with health inequalities. In a landmark study conducted by Mitchell and Popham (2008, 1655), they found that 'populations that are exposed to the greenest environments also have lowest levels of health inequality related to income deprivation'. Blue space research, albeit of more recent attention, presents an additionally strong body of evidence on the benefits of blue spaces to our health, with people living near, or being able to view coastlines being generally healthier, having fewer symptoms of stress, and generally being more satisfied with their lives than those living inland (Grellier et al., 2017).

The COVID-19 pandemic has emphasised how interconnected people and places are, and how much people value green spaces, especially for those in urbanised locations. Much data is still being collated on the impact of the pandemic on our relationship with nature. Yet what has been published already demonstrates clearly how much people value nature and natural environments be this related to experiencing nature

in private gardens (Pouso et al., 2020), public parks, National Parks and National Forests (ONS, 2021) or simply through viewing nature in green or blue spaces (Corley et al., 2021; Powers Tomasso et al., 2021). For example, one such study, GreenCOVID conducted across Ireland, Spain and England, demonstrated not only the value people placed on nature in the pandemic, but also suggested how people consider nature affects their health, their sense of individual and collective wellbeing (Garrido-Cumbrera et al. 2021, 2022; Guzman 2020, 2021).

10.2   Nature-Health Pathways

While there is now a robust body of evidence—and some general understanding and agreement—that access to nature can produce a range of psychological, physical and social benefits to people's health and wellbeing, there has been less agreement on the pathways through which these impacts on health are meant to accrue (see Hartig et al., 2014; Kuo, 2015 for an overview). Indeed, over the last 50 years, many theoretical and conceptual frameworks have been developed to explain the link between nature and health (see Table 10.1).

There are equally a large number of possible causal mechanisms posited. Indeed, in their review of the plausible pathways by which nature might promote health, Kuo (2015) identified no fewer than 21 plausible causal pathways, with some pathways understood better than others. Typically, however, most research has focused on four: environmental conditions, physical activity, relaxation and stress and social integration. Those working on environmental conditions, e.g., increased environmental microbial diversity, have highlighted the role that this can play in improving immunity and the risk of infectious diseases (Flies et al., 2017, 2018; Robinson et al., 2022). Likewise, those working on physical activity have demonstrated that better access to green spaces can increase physical activity levels, which is in turn linked to improvements in mental and physical health, e.g., improvements in sleep and obesity (Barton & Pretty, 2010; James et al., 2015). In terms of stress reduction, it is clear that both 'green' and 'blue' spaces can foster stress reduction, restoration and relaxation (Hartig et al., 2014; Roe et al., 2013; Thompson et al., 2012). Finally, in terms of social interaction, there is some evidence that nature can increase chances to have positive interactions with others, thereby reducing loneliness and promoting a sense of collective identity that is central to our sense of psychological wellbeing, though it must

Table 10.1 Theoretical and philosophical foundations

Theory	Development
Biophilia	Social psychologist, Erich Fromm (Gunderson, 2014) Biologist Edward O. Wilson (1993) Biophilia Hypothesis, 'the innately emotional affiliation of human beings to other living organisms' (Kellert & Wilson, 1993, 31)
Prospect-refuge theory	Geographer Jay Appleton, links to environmental aesthetics (1975): public preferences/perceptions of landscapes relate to what is considered to be needed for survival. Greatest preference for being able to see clear views from what might be considered as a safe space (prospect) and not being able to be seen (refuge). Clear implications for visitor management in leisure/tourism contexts: for examples, people who are unwell or tired, women, prefer more refuge whereas teenagers' preference would be to be seen Heerwagen and Orians (1993): implications for landscape design, i.e., availability of shelters and waymarking
Stress reduction theory	Introduced by Ulrich (1981): access to natural environments can have stress reducing properties and urban characteristics/ settings impede the process
Attention restoration theory	Theory developed by Kaplan and Kaplan (1989): People's ability to concentrate improves after spending time in nature or looking at nature scenes
Mandala of Health	Conceptualised by Hancock and Perkins (1985), the Mandala of Health presents a bio-psycho-social-environmental thematic framework depicting multiple determinants of public health. Similarly in 1991, Dahlgren and Whitehead developed the Rainbow Model, and reviewed its influence on policy, research and practice in 2021 (Dahlgren & Whitehead, 2021)

be said that social pathways remain understudied relative to the others (Gray & Manning, 2014, 2022; Maas et al., 2009; Sugiyama et al., 2008).

As pointed out by Kuo (2015), the multiplicity of pathways by which nature might impact on health lends much credibility to the fact that nature promotes health. Moreover, given the large number of potential pathways, the cumulative effect of these pathways on health at a population level might be quite large. However, it remains that a central conceptual framework that explains the nature/health link has yet to be agreed upon, although some have tried to put forward what such a framework might look like, e.g., by proposing a central pathway such as immunity (e.g., Kuo, 2015) or specifying domains of pathways (see Marselle et al., 2021). While it could be argued that the wealth of evidence, and the challenges of establishing causality in the area, make

such an endeavour unnecessary, it is also the case that the lack of a central framework that links nature to health is challenging because it limits its use in both public health strategy and in policy, and because it holds back the development of nature-based interventions in healthcare settings (Marselle et al., 2021; Chapter 8). A better understanding of the central mechanisms by which nature can impact on health is needed to guide health research and policy. We will pick up this point later in the chapter when we look at gaps in the evidence base.

10.3   Implementing Nature in Policy, Planning and Design

Given evidence of the health benefits of natural environments, the protection and enhancement of green (and more recently of blue) spaces as a public health strategy has been promoted by planning authorities, public health institutions, protected area agencies and other government bodies worldwide. Much of this is done in recognition of the fact that many people live without access to quality natural spaces that provide for rest, leisure, walking and other opportunities to increase our activities and enhance our lifestyles (PHE, 2020). This is also a context which demonstrates spatial and health inequalities, with the poorest and most disadvantaged presenting with the poorest health outcomes, and some of the lowest access to quality natural environments: all of which points to the necessity for improvements in our natural environment in planning processes and designs (Honey-Rosés et al., 2021; PHE, 2020).

In urban areas, this has meant the promotion of nature, the enhanced management of public parks, and increasing use of pocket parks, green wedges, and corridors of green infrastructure (de Oliveira, 2020). Local authorities aim to include not only enhancing public health and well-being by directly engaging the public in naturalistic spaces, but also the enhanced management of such spaces works towards maintaining our food, water and energy security against global challenges of climate change and natural disasters. An ecosystem approach to managing our greenspaces, "seeks to optimise the synergies between nature, society and the economy" through providing for nature-based solutions (Faivre et al., 2017, 509) that can result in both social **and** biodiversity benefits (IUCN, 2020). Such is the interest in blue spaces in Europe in helping to tackle public health challenges (particularly following the pan-European project BlueHealth), that blue infrastructure strategies are becoming

increasingly evident alongside green infrastructure approaches to enabling healthier active communities in urban areas (Grellier et al., 2018), even contributing to enhancing the notion of a sense of place in communities (see British Academy, 2016).

In rural locations, national parks and other forms of designated protected areas are promoted by tourism and leisure providers, turning many of these locations into tourism destinations in their own right. Popularity for these spaces is evident through the relatively constant public demand for accessing these areas. This is particularly the case since public restrictions on movement, driven by governments to contain the COVID-19 pandemic, were lifted. The result was a phenomenal increase in numbers of visitors to coastlines and rural spaces across the EU and in North America two examples (McLanahan, 2020; Rose, 2021). The situation for management agencies was overwhelming and has called into question how these areas can continue to be managed for tourism use, while maintaining their environmental qualities (see Chapter 14). Our natural environments are therefore providing opportunities for engagement with nature, while also facing significant challenges from the continuing degradation of our 'natural capital'. The impacts of climate change and the exceedances of the natural environment's capacity to sustain the multiple challenges are increasing the pressure on ecosystem functions. The cumulative impacts on our natural capital assets are particularly disconcerting as soil, water and biodiversity underpin healthy ecosystems that in themselves provide a wide range of essential and fundamental services that sustain our livelihoods and wellbeing.

The political will to encourage people's engagement with greenspaces and support the management of these areas, is invariably expressed through policy formulation, and informed and implemented by urban and landscape management and planning services. Policy and strategic direction for the interconnection of protected area agencies with public health services is evident through activities driven by global institutions such as the International Union for the Conservation of Nature (IUCN) (see Box). These also link to the United Nations Sustainable Development Goals, especially related to nature-based solutions, sustainable land management and planning and health and wellbeing. Additional strategic direction is found worldwide at regional levels, including as key examples, in parts of Europe, North America, Latin America, Canada, Australia and New Zealand.

IUCN World Commission on Protected Areas (WCPA) Health and Well-Being Specialist Group

The IUCN WCPA Health and Well-being Specialist Group promotes the health and wellbeing benefits of nature across conservation, public health and other sectors. Its activities build upon previous work progressed through the 'Healthy Parks Healthy People' programme of work. Key aims include: facilitating partnerships and collaborations among organisations to influence policies and plans across the sectors; building and communicating the body of evidence on benefits of nature for human health and well-being; and encouraging the development of standard metrics to measure co-benefits.

There are three key objectives of the Health and Well-being Specialist Group.

- Contribute to further building the evidence and knowledge base on health and wellbeing interdependencies between natural planetary ecosystems and human populations.
- Mainstream the knowledge of health and wellbeing implications of nature across the conservation, health and other sectors through the development of interdisciplinary materials, case studies, tools and programmes.
- Facilitate partnerships at a global, regional, national and sub-national scale between entities working on environmental health and human health to influence policies and plans across sectors that support programmes in parks and protected areas.

The Health and Well-being Specialist group works with other teams within the IUCN whose remit aims to connect people with nature. These include #NatureForAll, Urban Conservation Strategies and Ecosystem Services groups.

Taking the Australian case, initiated by Parks Victoria, 'Healthy Parks Healthy People' (HPHP) was created to promote the value of the environment to people's health. What has become a hugely successful programme that includes greenspace agencies and government departments working with public health practitioners, a number of initiatives including park prescriptions, free access to what are branded as greenspaces for health, has encouraged additional health and environment alliances at various scales in the USA, Canada, South Korea, Scotland and in Europe. These apply the principles of HPHP in partnership with sectors including tourism, leisure, complementary medicine working with

environmental managers, and many have national strategies. Such are discussions across Europe, that initiatives are validated even further by activities and specialist working groups led by the EUROPARC Federation, encouraging collaborations between protected area and greenspace managers working with public health officers.

Drawing on the UK context specifically, such activities have been promoted by national governing bodies, including Public Health England (PHE, 2020), and are being endorsed within 'Department of Environment Food and Rural Affairs' (Defra) 25-Year Environment Plan, resulting in activities being implemented by protected area agencies, local authorities and greenspace managers frequently engaging with local communities (box text below). Moreover, there is increasing policy emphasis on designing and developing interventions that support people's interactions with natural environments, with some clinicians actively prescribing patients' engagement in greenspaces for health reasons as part of preventative and reactive treatments drawing upon social and green prescribing (e.g., PHE, 2020; van den Berg, 2017).

Charitable (NGO) Foundations for Action

The Parks Foundation is an independent charity, established in 2015, devoted to enhancing Bournemouth, Christchurch and Poole's parks and green spaces. It was born out of a desire to create inspirational parks that improve people's health and wellbeing, reconnect people with nature and bring diverse communities together. Although a young organisation, The Foundation has achieved a lot in a short space of time by using the therapeutic nature of being out of doors to improve people's wellbeing while also increasing biodiversity in urban greenspaces. Its Parks in Mind project, which started in 2017, is a green social prescribing project designed to improve people's physical and mental wellbeing through the delivery of inclusive activities and volunteering opportunities. Delivered in parks that are frequently found in areas characterised by deprivation, one such case includes Boscombe. This is one of the five per cent most deprived areas of the UK. Boscombe residents have the lowest life expectancy of all Bournemouth wards and the highest level of hospital admissions for self-harm. Unemployment rates are more than three times the national average. Up to 35% of residents in the area do not have access to a garden or outdoor space, making their park-based activities a crucial part of their participants' lives.

Our Parks in Mind programme is a combination of nature conservation, arts-based therapy and wellbeing activities. In any month, participants may enjoy gardening, tree planting, mindfulness walks, tai chi or star gazing—all for free. Participants are either referred to the project (perhaps through their GP, a community mental health team or alcohol/drug rehabilitation scheme) or they can self-refer. The Foundation can evidence the difference it is making to people's lives too with 92% of participants stating that their mental health and overall wellbeing has improved and 98% feeling the quality of their lives has improved. One participant told them:

> "Thank goodness for these sessions. They have greatly helped me to adjust from the physical restrictions and mindset of the pandemic, to venturing outside again, to enjoy nature, a wide range of well-being and crafting activities, and socialising with different people".

As well as Parks in Mind, the Foundation delivers another project called Green Heart Parks, which currently works across 15 community parks in the area (see Fig. 10.1). This work reimagines parks from being green deserts into wildlife rich havens which increase biodiversity and engage local residents through inspiring and educational activities. During 2022, The Foundation delivered 550 activities to 5,880 people. With a focus on community growing and breaking down barriers to participation for non-park users, this community ground-up project helps both wildlife and neighbourhoods thrive.
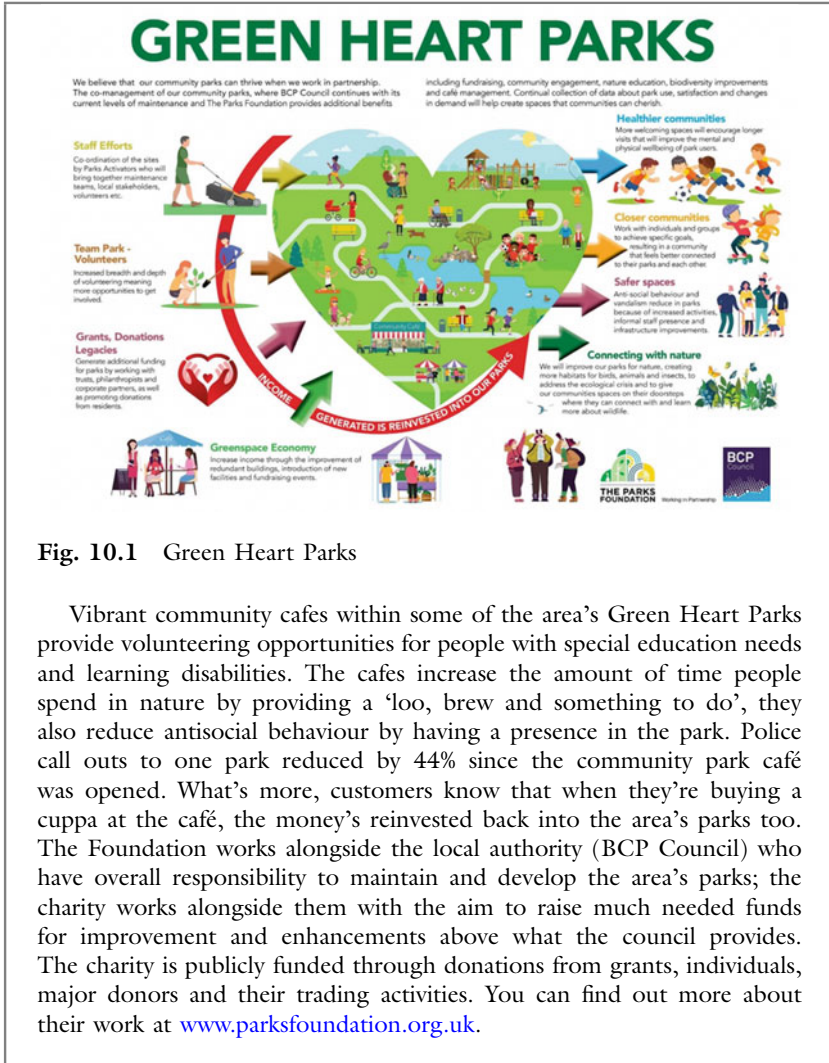
Fig. 10.1 Green Heart Parks

Vibrant community cafes within some of the area's Green Heart Parks provide volunteering opportunities for people with special education needs and learning disabilities. The cafes increase the amount of time people spend in nature by providing a 'loo, brew and something to do', they also reduce antisocial behaviour by having a presence in the park. Police call outs to one park reduced by 44% since the community park café was opened. What's more, customers know that when they're buying a cuppa at the café, the money's reinvested back into the area's parks too. The Foundation works alongside the local authority (BCP Council) who have overall responsibility to maintain and develop the area's parks; the charity works alongside them with the aim to raise much needed funds for improvement and enhancements above what the council provides. The charity is publicly funded through donations from grants, individuals, major donors and their trading activities. You can find out more about their work at www.parksfoundation.org.uk.

10.4   WHAT ARE THE EVIDENCE GAPS?

A substantial body of evidence has already been collated on natural health services and the subject area is considered to be fast-moving towards maturity (Van den Berg, 2017). It has been an area of work that has attracted much academic attention, yet important gaps remain. Here we consider some of those gaps and make recommendations for future research. To date, research attention has primarily focused on urban settings. Communities living in rural and coastal areas are typically under-studied, despite the fact that in the case of the UK for example, nearly 10 million people (17% of the population; Defra, 2021) live in these areas, that are characterised by complicated health patterns (LGA, 2017). While there is some evidence that psychological and physical health may be better in rural areas, partly because of exposure to natural environments, it is also the case that issues of deprivation, isolation, inaccessibility to local health and recreational services, can lead to poorer health and wellbeing outcomes.

It is also difficult to compare inequality and health differences between urban and rural areas, as causes for these may vary across these two contexts. Further research at a local level is essential to better understand the complex health experiences of residents in rural and coastal areas. For example, there is increasing evidence in urban areas that soil and/or airborne microbial diversity plays an important role in improving human health through enhancing immune status and helping to ameliorate disease risk (Liddicoat et al., 2019, 2020; Mhuireach et al., 2016) (see Fig. 10.2). Yet to date, the application of human–environment microbiome interactions in rural settings remains underexplored.

Linked to this urban focus, limited attention has been paid, in detail, to the range of green spaces, their environmental components and the importance of ecological conditions to health and wellbeing. Research has generally employed rather simplistic conceptualisations of 'green space' (Frumkin et al., 2017; Lovell et al., 2020; Wheeler et al., 2015). This has resulted in limited regard for geographic complexities, including greenspace types, their environmental characteristics and ecological condition (Frumkin et al., 2017; Lovell et al., 2020; Wheeler et al., 2015). As such, we have limited knowledge of the importance of biodiversity in natural spaces, the range of complex landscapes, their characters, their configurations, their functionality (e.g., agricultural, pastoral), or how
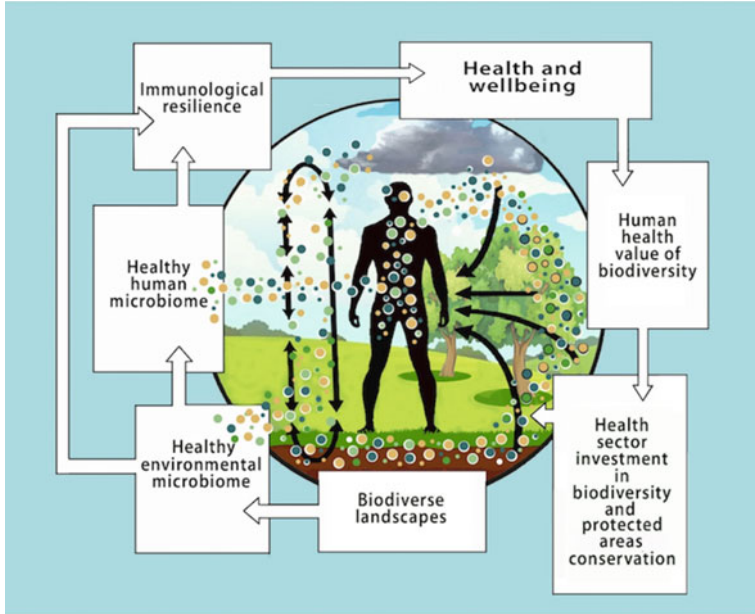
Fig. 10.2 Microbiome process, influences and impacts (*Source* Adapted from Mills et al. 2017)

varying landscape types, their microbial diversity, environmental condition, characteristics and even their publicly perceived 'special qualities' can improve health and wellbeing (see also Marselle et al., 2021).

There is also a need to better understand people's landscape preferences and their perceptions of different landscape types. Extensive research demonstrates that perceptions of landscape types, impact on how people use a space (Gatersleben & Andrews, 2013; Jansson et al., 2013; Knez & Eliasson, 2017; Stigsdotter et al., 2017) and is related to improvements in physical and psychological health (Fuller et al., 2007; Sandifer et al., 2015). Yet, much of this work also focuses on urban settings, with more limited research on 'wild' natural environments (Hägerhäll et al., 2018). Research is therefore needed that brings together population-level data with socio-cultural data collected at local spatial levels (Wheeler et al., 2015)—particularly in rural areas—in order

to address important questions about how such landscapes can be used as a resource for encouraging healthy behaviour.

Recent studies have progressed our understanding of how different landscape types might be evaluated to determine their health and well-being properties (e.g., Alcock et al., 2015; Wheeler et al., 2015). Yet, these have produced mixed results, potentially due to the limited measurements of health used, e.g., single measures of psychological distress (e.g., Alcock et al., 2015). Fewer studies include multiple health outcomes, despite long-held universal agreement that health is a complex construct of multiple dimensions (Dahlgren & Whitehead, 1991; Patz et al., 2012). As a result, studies often fail to specify the breadth of possible outcomes and pathways, or the possible interactions between these (Lee & Maheswaran, 2010). This data is increasingly becoming available, for example Office of National Statistics Health Index for England measures health across three domains (including access to green spaces) at local authority, regional and national levels (see Health Index for England).

Though currently understudied, this offers great potential because the complex interplay among known and potential pathways by which nature impacts on could be key to developing conceptual frameworks that work in this setting (Marselle et al., 2021). For example, Annerstedt et al. (2012) found that certain green qualities (e.g., tranquillity and space) only impacted on the risk of poor mental health when physical activity was considered. There is a need for research that takes multifactorial and multiple-pathway approaches to understand complex relationships between a broad set of health and wellbeing outcomes with natural environment types, their ecological condition, their characteristics and their qualities.

Given these gaps in our knowledge, what is evident is that further research is needed to improve the evidence base for strategic and policy decisions about the role of natural environments in health and well-being. Addressing these gaps requires us to recognise the heterogeneity of landscapes (including those in rural areas), focusing on distinctive landscape types, characters, and ecological condition, and to examine a broad set of physical, psychological and social health and wellbeing outcomes. Moreover, it highlights the need for critical evaluations of the interactions between natural capital and associated non-use values, in order to provide a more nuanced understanding of the relationships between green spaces, and health and wellbeing. This calls for a multifactorial, and

transdisciplinary enquiry that engages diverse landscapes, environmental characteristics, populations, applied sciences and stakeholders (see Box).

A Conceptual Framework for Examining Impacts of Multiple Environmental Factors on people's Health and Wellbeing

A fundamental aim of the 'Significant Spaces' project has been to address many of the gaps in the current body of research relating to the impact of green spaces on health. In particular, a key aim has been to redirect attention from urban green spaces to rural spaces, where many protected and designated landscapes, valued for the quality and extent of their biodiversity and socio-cultural assets, are found. Such spaces could be considered to be 'optimum' greenspaces, based on the extensive range of space and ecosystem services they provide. However, we know relatively little about the impact of such 'optimum spaces' on human health and wellbeing, nor about their economic value, with the result that the benefits that such spaces bring have been frequently overlooked or ignored in decision-making. Indeed, many of the original aims for conserving protected and designated landscapes in rural areas have been challenged and more generally, specifically in the UK example, many green open spaces are being degraded or lost due to a lack of economic incentive to justify their protection and/or conservation.

'Significant Spaces' calls for a new programme of research for which as exemplary case study areas, the 38 Areas of Outstanding Natural Beauty (AONBs) in England and Wales are identified. In this national case study framework, landscape planning practice and methodologies are brought together with those from social, economics, behavioural, biological and applied sciences, in order to examine the health and wellbeing properties of AONB designated landscapes. A three-stage approach is suggested in order to build a framework that acknowledges, and enables research to examine, the multiple determinants of physical health and mental wellbeing. Shown in see Fig. 10.3, are a number of layers of data collection required. Working from the bottom layer upwards, the first stage involves the analysis of existing landscape, topographical and ecological data in order to construct a national typology of landscapes by type, by their respective characteristics and by their condition, for each of the 38 AONBs in England and Wales.
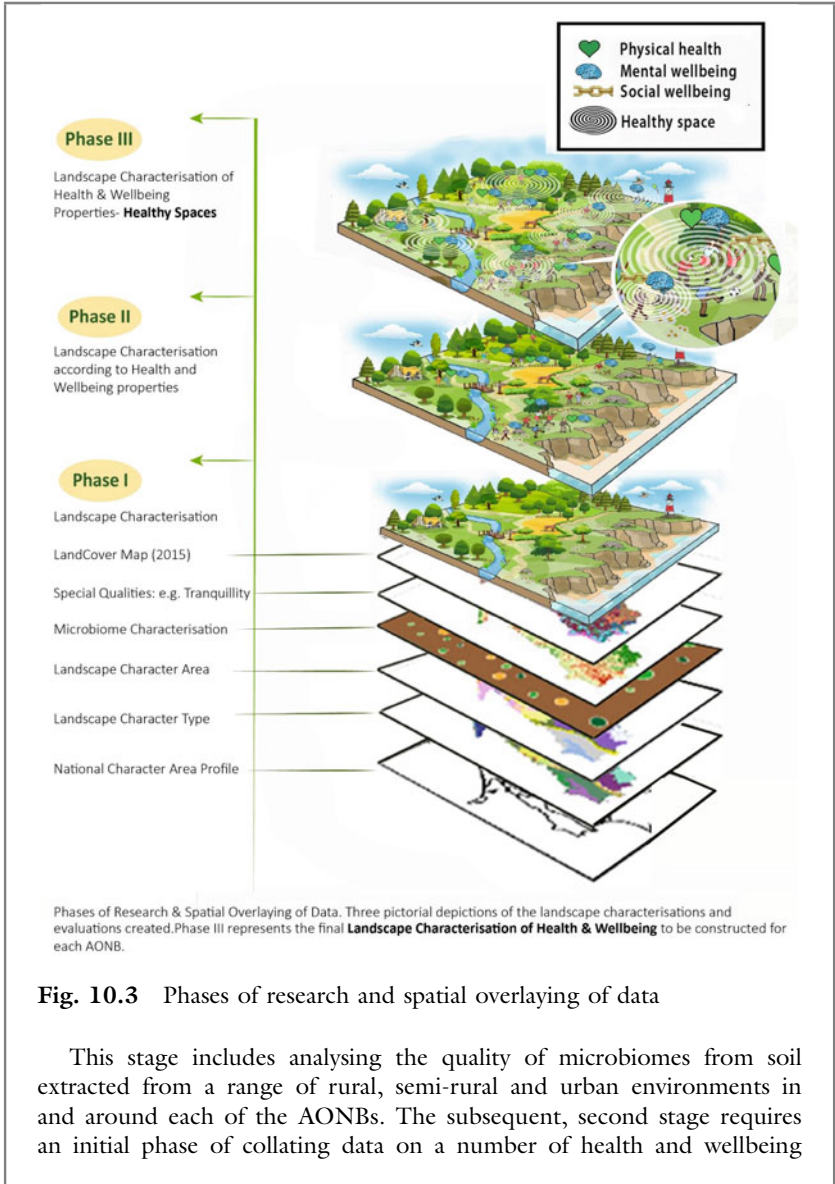
Phase III
Landscape Characterisation of
Health & Wellbeing
Properties- **Healthy Spaces**

Phase II
Landscape Characterisation
according to Health and
Wellbeing properties

Phase I
Landscape Characterisation

LandCover Map (2015)

Special Qualities: e.g. Tranquillity

Microbiome Characterisation

Landscape Character Area

Landscape Character Type

National Character Area Profile

Physical health
Mental wellbeing
Social wellbeing
Healthy space

Phases of Research & Spatial Overlaying of Data. Three pictorial depictions of the landscape characterisations and evaluations created.Phase III represents the final **Landscape Characterisation of Health & Wellbeing** to be constructed for each AONB.

Fig. 10.3   Phases of research and spatial overlaying of data

This stage includes analysing the quality of microbiomes from soil extracted from a range of rural, semi-rural and urban environments in and around each of the AONBs. The subsequent, second stage requires an initial phase of collating data on a number of health and wellbeing

factors of visitors to and residents in and around an AONB. Subsequently a comparative, quantifiable evaluation would be progressed to determine what impact might be determined on people's health and wellbeing outcomes of their access to and experience in a range of landscape types, of distinct landscape characteristics, and of varying ecosystem health/quality. For example, the quality of microbiomes collected at stage one, would be compared with physical health data provided by local residents in and visitors to the AONBs during stage two. The third and final stage, depicted as the top layer in Fig. 10.3, represents a model of a space according to its environmental characteristics, condition and effect it could have on people's health and wellbeing, should they access that area. This model constructed according to a ranking of health and wellbeing benefits gained from each landscape type would additionally inform the creation of landscape characterisations in each of the 38 AONBs resulting in an innovative model of healthy spaces that will enhance both the body of academic research and inform policy design and its implementation.

The results of this framework would feed into, and build on, existing environmental and cultural records of Landscape Character Assessments (LCAs) across the AONB network; resulting in the design and construction of an additional unique and innovative layer to the suite of existing LCAs that will subsequently feed into national, regional and local planning, development and productivity strategies that are aimed at enhancing public health, spatial planning, environmental management and economic performance. Consequently, 'Significant Spaces' would fill an important gap in our understanding of the health and environmental value of designated spaces and would inform how this importance should impact on how we plan and manage for these spaces at local and national levels. Additionally, it would address pressing concerns around the statutory purpose of designated landscapes in the twenty-first century, through an evaluation of these spaces in terms of their health and wellbeing benefits.

10.5   Conclusion

There is now a large body of work that evidences the beneficial relationship between natural environments and human health and wellbeing, and it has been noted by many that this field is fast-moving towards maturity. However, it is also the case that key gaps in our understanding remain. Most notably, there is a need to move beyond a research focus on urban environments, and a need for more research which interrogates

the complexities of landscape characteristics and quality, as well as incorporating multidimensional understandings of health and wellbeing. What is needed, is robust and replicable evidence that recognises the inherent complexities of studying landscapes as a geographical area of interactions between people and place. Only this will enable a better understanding of the central mechanisms by which nature can impact on health, which is sorely needed in order to guide health research and policy. Indeed, in contrast to the reams of research in this area, albeit there is universal understanding that green blue spaces are good for our health, consequently nature-based interventions are emphasised, little of the evidence suggested on relationships between greenspaces and their influence on health has actually made its way into practice, raising questions as to how research and its findings can be applied.

There is a clear need to link, in the development and design of research programmes, to the practical tools that are used in the design and development of greenspaces on the ground. We have provided one example in the box text above of how this might work, through the Health and Wellbeing Landscape Character Assessment. We would argue that it is through the integration of research with planning tools such as these that research can effectively feed into national, regional and local spatial and environmental planning and development that is aimed at enhancing if not targeting specific populations and public health activities.

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