



The Anthropocene, Nature-Based Security and Mental Well-Being

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ABSTRACT

Traditional human security thinking sees nature either as a direct threat to human well-being or as a threat resulting from human action, as is the case of pollution or climate change. Protection against threats has been a major concern of human security thinking, yet that thinking has not examined the *positive* role nature can play in mitigating threats or promoting well-being. This paper asks whether the concept of nature-based human development adds a useful lens through which to advance human development thinking, and whether nature-based human development provides a more productive way of understanding Anthropocene-linked disasters, mental well-being and possible nature-based solutions. The paper opens with a brief discussion of human security and its relationship to disasters before turning to the concept of nature-based human development. Here, the concept of nature-based security is introduced, paying particular attention to mental well-being as exemplified in the United Kingdom, where during COVID-19, nature played an important role in providing safety and freedom from danger, fear and anxiety, if only for a limited time. It is argued that relatedness to nature should be seen as part of the ‘vital core’, and hence, there should be corresponding rights—we have a right to nature.

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Introduction

“Human consciousness is—as far as we know—a fundamentally new property of the Earth system.”

—Lenton 2016

“Being able to live with concern for and in relation to animals, plants and nature.”

—Nussbaum 2007, “List of Central Capabilities”

The human development approach as elucidated by the Human Development Reports has offered an alternative vision of development to that of increasing income or gross domestic product (GDP). The approach has drawn on Amartya Sen’s concept of development as increasing the freedoms we have to live the lives we value (Sen 1999). The approach can be seen as a family, the members of which often resemble one another with various features overlapping and crisscrossing. It includes capabilities, basic needs, human security and rights. Often these approaches have had similar parentage and are institutionally strongly connected to UNDP. Descendants’ usage of the various approaches can contrast sharply, such that cousins can seem closer than brothers and sisters.¹ Consequently, there are no clear boundaries between the different approaches. Furthermore, all members of the family have a desire to be practical in order to influence policy and, therefore, lists of ‘basic capabilities’, ‘central capabilities’, ‘human needs’ or a ‘vital core’ overlap considerably with a corresponding loss of fine distinctions.² Human security and rights are secondary as we have to establish the aim of human development and the vital core first in order to establish what we are to secure and what rights should cover.

The *2020 Human Development Report* was innovative in several ways. It placed human development in the context of Earth systems science, emphasizing the Anthropocene and associated planetary pressures, and it introduced the concept of nature-based human development, offering a distinctive human development approach to understanding and responding to the Anthropocene. The concept of nature-based human development was not defined, which allows for some elasticity in its further growth. At a general level, it might be conceived as being a mixture of a largely Sen-inspired concept of human development, and a nature-based approach not dissimilar to the ideas propounded by the United Nations Environment Programme (UNEP) and the International Panel on Biodiversity and Ecosystem Services (IPBES). The concept thus moves away from

¹ Compare, for example, Doyal and Gough’s work on human needs with Nussbaum’s central capabilities (Gough 2014) and Wood’s (2003) approach to human security and the basic needs approach as elaborated by Stewart (2019).

² See Alkire (2005) for a thorough discussion.

the troubled notion of sustainable development and is forward looking both in terms of human development and nature-based solutions and initiatives. Thus the *2020 Human Development Report* states:

Nature-based human development is about nesting human development—including social and economic systems—into ecosystems and the biosphere, building on a systemic approach to nature-based solutions that puts people’s agency at the core (UNDP 2020, p. 10).

This paper is written in the context of the Anthropocene and the COVID-19 pandemic. It is specifically related to human security and disaster risk reduction. Pandemics are often the result of planetary pressures due to people’s, especially vulnerable people’s, increasing contact with nature as a consequence of deforestation, agricultural expansion and intensive farming, the exploitation of wild species and mining. In addition, there has been increasing trade in wild animals (IPBES 2020a). Leach et al. (2021) provide examples of avian and swine influenza being the result of industrial production, in Asia in the first case and Mexico and the United States in the second. The 2013 Ebola epidemic in West Africa was, they argue, the result of a complex of “bats, intermediate wildlife hosts, dynamic forest ecologies and human-to-human transmission. These intersect with social and livelihood dynamics (e.g. migration, mining and hunting)” (ibid., p. 105233).

This paper asks whether the concept of nature-based human development adds a useful lens through which to advance human development thinking, and whether nature-based human development provides a more productive way of understanding Anthropocene-linked disasters, mental well-being and possible nature-based solutions. The paper opens with a brief discussion of human security and its relationship to disasters before turning to the concept of nature-based human development. Traditional human security thinking sees nature either as a direct threat to human well-being or as a threat resulting from human action, as is the case of pollution or climate change (UNDP 1994). Protection against threats has been a major concern of human security thinking, yet that thinking has not examined the *positive* role nature can play in mitigating threats or promoting well-being (Gasper and Gomez 2014). Here, the concept of *nature-based security* is introduced, paying particular attention to mental well-being as exemplified in the United Kingdom, where during COVID-19, nature played an important role in providing safety and freedom from danger, fear and anxiety, if only for a relatively limited time. It is argued that our relatedness to nature should be seen as part of the ‘vital core’, and hence, there should be corresponding rights—we have a right to nature.

Human security and disasters

Developed at the end of the cold war, the *1994 Human Development Report* introduced the concept of human security, which was understood as protecting “the vital core of all human lives in ways that enhance human freedoms and human fulfilment...” (MacFarlane and Khong, p. 160). This definition extended the concept of

security beyond State security and violence against individuals to include: 1) economic security, 2) food security, 3) health security, 4) environmental security (emphasizing the negative footprint humans have had on the planet since industrialization; water shortages, air pollution, deforestation, salinization and disasters were given particular attention), 5) personal security (including threats to the self, such as suicide and drug use), 6) community security, 7) political security and 8) global security. The list is not intended to be canonical, and people may differ as to what they find crucially important.

The word `security` has a natural language usage relating to freedom from danger, fear, anxiety and loss of employment, according to the Merriam-Webster online dictionary.³ Additionally, the concept has more specific uses within a variety of disciplines, including psychology, which is the main area of interest here. Thus, desires to limit human security to violence or the discipline of international relations (e.g., MacFarlane and Khong 2006) are an affront to natural language usage and other disciplines.

The *1994 Human Development Report* referred to Sen's work on famines, which has played a significant role not only in our understanding of famines but disasters more generally. He argued that famines are not the result of insufficient food but of people not having enough food as a result of social arrangements. Some famines, such as the 1943 Bengal famine, have their root causes in authoritarian regimes such as British colonialism. Thus, preventing such famines requires political change. According to Sen, there has never been a famine in a democratic country (Sen 2009), which is one reason why Sen places so much emphasis on public reason. However, this claim is open to dispute with counter examples—including the 1960 Bihar famine in India (Rubin 2009). Nevertheless, even if caveats are needed, Sen has played a central role in shifting the emphasis in disaster research and disaster risk reduction from the hazard itself to society as being the most significant cause of disasters (Blaikie et al. 2004, Hewitt 2012).

In contrast with Sen and the work on root causes, working within the human security paradigm, Gomez (2020) places much greater importance on the disaster cycle of response, recovery, prevention and preparedness. The argument here is that concentrating on root causes emphasizes the negative side, whereas stressing the disaster management cycle focuses on the positive side (ibid.). Thus, "Progress in security is thus measured in relation to the expansion of protection and strengthened resilience, and to how much of the resources invested in an emergency (e.g., in fighting wars) can be moved to other parts of the cycle, particularly prevention and preparedness..." (ibid., p. 13).

There is room for both paying attention to root causes and the disaster cycle. Viet Nam is a case in point. It has a population of 96 million people and is classified as a lower-middle-income country but has reached a stage

³ See: https://www.merriam-webster.com/?gad_source=1&gclid=Cj0KCQjwhfipBhCqARIsAH9msbkkfZ29PBiPoSdTxPJNFRcqc-LKgLd98L5LBHOI2CdLQoMoTtxaflaAlu5EALw_wcB.

of high human development. It has close trading ties with China and regular cross-border movement. In other words, as a country, it should have been very vulnerable to the COVID-19 pandemic. Yet in the early stage of the pandemic, it experienced ‘just’ 110 deaths. Whereas the United Kingdom, with a population of roughly 68 million in a high-income country with very high human development, saw over 128,000 deaths. Viet Nam’s success at providing security in the face of the pandemic has been attributed to its experience with SARS and avian flu. Its rapid preventative measures included closing the border with China, testing, lockdowns, quarantines (especially of international travellers), clear communication and investment in health.⁴ These steps clearly had great significance in reducing disaster risk. By contrast, as I will return to later, one of the causes of the deaths in the United Kingdom was what the British Medical Association described as “Covid’s little helper,” namely, years of government austerity measures (BMJ 2020).

Nature-based human development and nature-based security

One might suspect that ‘nature-based’ is the latest fad without offering much that is lasting. There is already substantial literature, however, on nature-based initiatives and solutions and their practical application as well as a healthy debate concerning their efficacy and scientific credibility. Nature-based solutions should be beneficial for human well-being and nature.

My conceptualization of nature-based human development differs from that introduced by the *2020 Human Development Report* (quoted above):

Nature-based human development concerns humans’ relatedness—enmeshed in socio-cultural, political and economic systems—to ecosystems’ and the biosphere’s unequally distributed threats and opportunities, accenting people’s agency and expanding freedoms people have to lead valued lives that are justifiable to others.

Firstly, my definition emphasizes normal human development concerns that remain central, as are the overarching importance of agency and Sen’s conceptualization of development as expanding freedoms. Secondly, it sees human development as based in nature and emphasizes our relatedness to unequally distributed threats (such as lions, earthquakes and viruses) and opportunities (such as lions, mountains and trees) offered by nature. An opportunity for one person may be a threat to another. Elephants, lions, leopards, tigers and so on may present opportunities for those on safaris but are considerable threats to those who live with them—in the worst case, death. Foraging elephants eat crops and drink water resulting in food and water

⁴ See more at: <https://ourworldindata.org/covid-exemplar-vietnam> access 10/07/2021.

insecurity. Predators can affect school attendance and have negative mental well-being consequences (such as fear) (Mariki and Sengelela 2019, Gross et al. 2001).

Thirdly, drawing primarily on Scanlon (1998) and Forst (1994), my approach introduces a critical contractualist theory of ethics and rights, based on the concept of justification to others, although this is not discussed here (see Crabtree 2012). Fourthly, nature-based solutions are a significant but not the only element of policy options. As the *2020 Human Development Report* also pointed out, it should not be forgotten that taxation policy, for example, is also of great importance.

Our relatedness to nature: environmental psychology, the vital core, rights and real freedoms

Seeing humans as nature-based draws our attention to our historical roots and our role in Earth systems. As the quote from Lenton (2016) at the top of this paper makes clear, human consciousness is the latest addition to the Earth's systems. Our relatedness to nature is founded in human evolution—humans are based in nature. The word 'nature' is problematic in that there has been a long history of human interaction with other Earth systems. Indeed, there is little 'untouched' nature—"natural history is human history" (Ellis et al. 2021, p. 4). At the end of the Pleistocene (the last ice age), approximately 12,000 years ago, humans already inhabited approximately 75 percent of the Earth's land, with land use causing extensive changes to biodiversity. Approximately 95 percent of temperate lands and 90 percent of tropical wooded areas were inhabited at that time. Indeed, the period after the end of the ice age saw the extinction of much megafauna, probably due to a mixture of climate change and human activities. Here, 'nature' is understood as cultured nature. From this perspective, land we currently consider 'natural' or 'wild' has in fact a long cultural history.

One way of understanding our connectedness to nature is through Wilson's concept of 'biophilia', which he defines as "the innate tendency to focus on life and life-like processes" (Wilson 1986, p. 1).⁵ For Wilson, the brain's functioning is the result of natural selection through "operating through the filter of culture" (ibid., p. 12). At present, there are two main theories explaining why nature (green and blue spaces) is beneficial to human well-being, namely Ulrich et al.'s (1991) stress reduction theory and Kaplan and Kaplan's (Kaplan 1995) attention restoration theory. Though neither approach refers to Earth system science directly, they are both to be understood in the context of evolution.

For Ulrich, it is important that humans initially developed in the context of natural as opposed to urban settings. Consequentially, we respond differently in different contexts. If the natural environment is (perceived as)

⁵ The term is originally Eric Fromm's.

unthreatening, blood pressure and heart rates are reduced. Conversely, the increase in a threatening natural environment escalates stress. In other words, the stress response differs. Low stress levels lead to sustained attention, which reduces both negative thoughts and emotions. Serious health problems arise if stress levels remain high in non-threatening environments. In a well-known study of patients in a Pennsylvanian hospital, Ulrich et al. (1984) found that a room with a view of nature, simply through a window, had greater restorative value for patients compared with those who had a view of a brick wall. The evolutionary point is that humans adapted to the natural environment prior to living in settlements, which are said to be more stressful, and the fundamental relationship remains. This thesis is difficult to verify, and one might want to question it as there was an evolutionary advantage in starting to live in settlements.

Attention restoration theory (Kaplan and Kaplan 1989, Kaplan 1995) also draws on evolution as part of its justification. Directed attention covers cases when our attention is devoted to a specific task or interest, in other words, when we are paying attention. Doing so leads, over time, to tiredness or fatigue. This contrasts with involuntary attention or ‘soft fascination’, which is effortless, as when watching the sun going down. This is restorative. The evolutionary explanation is that continued direct attention shuts out other phenomena with which we are not directly concerned. Cutting our minds off from everything else, however, means that we are less vigilant of dangers that may surround us—wild animals, for example. Thus, attention fatigue has a clear benefit, but attention needs restoring as both functions are central to human well-being (Kaplan 1995).

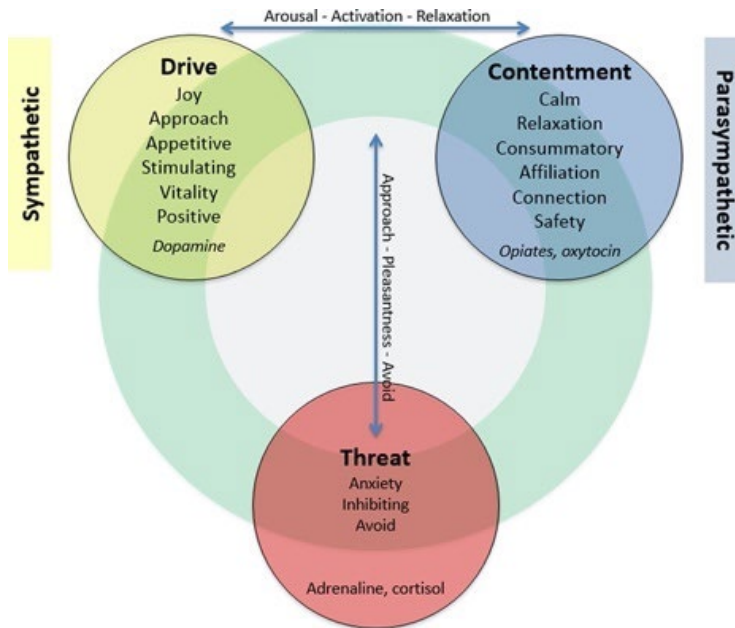
In addition to providing soft fascination, nature offers three main factors for restoration. Firstly, it allows us to ‘be away’ from everyday routines. This includes both ‘getting away from it all’, as with Bedouins going into the desert with their donkeys for a couple of days, as well as more prosaic shifts of attention. Secondly, nature must have ‘extent’; “it must provide enough to see, experience, and think about so that it takes up a substantial portion of the available room in one’s head” (Kaplan 1995, p. 173). Thirdly, it must be ‘compatible’ in relating both to what we are trying and like to do—there is no struggle. Compatibility varies from one person or culture to another. Not everyone would find going into a desert with a donkey a relaxing experience (see also Bratman et al. 2019).

Further developing the frameworks above, Richardson et al. (2021) have developed a simplified three-circle model of affect (moods, feelings) regulation to explain how nature is able to play a role in balancing our emotions and well-being (Figure 1).⁶ Since emotions have, in part, a physiological aspect, any adequate model of our link to nature will have to include affect regulation. The model has three components, namely, drive, threat and contentment, which are interlinked and connected to our nervous system and the release of specific hormones. A traditional human security approach would concentrate on the importance of threats that, for instance, produce anxiety and are linked with avoidance. From a nature-based human development approach,

⁶ For more on cognitive-emotional interaction, see Pessoa 2008.

nature’s opportunities relate to drive and contentment. Drive concerns our pursuit of various ends. It is closely connected to the sympathetic nervous system and consumes energy. The parasympathetic nervous system is coupled with restoration (rest and digest) and more closely linked with contentment. A balance has to be achieved, otherwise we would burn out.

Figure 1. The three-circle model of affect regulation



Source: Richardson et al. 2016.

Thus, cultured nature provides opportunities in relation to drive and contentment and is the source of threats. Humans have also evolved as sociocultural beings. From this perspective, emotions “tend to be elicited by other people, expressed toward other people, and regulated to influence other people or to comply with social norms” (van Kleef et al. 2016, p.1) at a variety of levels, from individual (such as feelings of gratitude) to dyadic (such as the emotional expressions of partners or taking another’s expression of pain or threat to be a warning). Within the context of a group, expressions of emotions tend to help build group identity and exclude others. At the cultural level, different expressions have been found to relate to a culture’s key features and power (van Kleef et al. 2016). Although there is little work done in this area, it would seem highly relevant as we often experience nature *with others*, as indeed we have done throughout our evolution. It will be difficult to establish the effect on well-being or mental health as solely being an effect of nature. This points to an exceedingly important gap in the environmental psychology literature.

The central point here is that contentment is also related to safety and hence security, which implies a concept of *nature-based security* that meets fundamental needs and is, therefore, part of the vital core. This in turn implies that we should have rights concerning access to nature.⁷

Green and blue spaces

Links between the regeneration of nature and well-being have already been acknowledged (UNEP 2021). This section provides a fuller overview of the literature linking nature and well-being before looking more specifically at the COVID-19 pandemic and possible win-wins for well-being, mental health, ecosystem restoration and climate change. It is important to emphasize that neither UNEP nor the *2020 Human Development Report* envisage that nature-based solutions will do everything. Similarly, the argument here is not that contact with nature will make up, say, for depression due to the loss of employment resulting from a COVID-19 lockdown. Nature-based solutions can make significant contributions, but other interventions may be more important—creating employment, for example.

In contrast to lions and elephants, the vast majority of the literature on the possible positive impacts of nature on mental health is concerned with green and blue spaces that are not clearly defined but include video experiments, views from windows, plants within houses, gardens, local parks, rivers, coastlines and national parks. As we have already seen, much of what people consider ‘nature’ has a long cultural history and includes vast areas of degraded land targeted for restoration.

The concept of well-being is employed in diverse ways within the green-blue literature. It includes eudemonic (flourishing), hedonistic, life satisfaction, subjective well-being and mental disorders. In terms of the last category, usage is sometimes vague as, for instance, depression may include both mild and severe depression. The picture becomes even more complicated when measures are taken into consideration, as a large variety of scales are employed, as are screening tools, and are thus not strictly comparable. These can be self-administered online and so do not represent actual cases for which clinical assessment is required.

The World Health Organization (WHO 2021) published a recent extensive review of the literature. Of 15,851 papers found in initial searches, the screening process reduced the number to 135 that included 55 cross-sectional studies, 68 experimental studies and 12 qualitative papers. Some of the most important findings concerning green spaces are summed up in Tables 1 and 2.

⁷ In July 2022, the United Nations General Assembly adopted a resolution declaring access to a clean, healthy and sustainable environment to be, a universal human right.

Table 1. Summary of mental health outcomes per green space category—experimental studies

| | Short-term health | | | | | | | Long-term health | | | | | | | | | | | | | | | | | | | | |
|----------------|-------------------|---|----------|---|----------------------|---|------------------|------------------|----------------------|---|-------------------|----|----------------|---|---------------|-------------------------------|---------------------------------|------------------------|-----------------|-----------------------|---|---|---|---|---|---|---|---|
| | Affect | | Vitality | | Restorative outcomes | | Perceived stress | | Physiological stress | | Problem behaviour | | Brain activity | | Mental health | Severity of a mental disorder | Prevalence of a mental disorder | Satisfaction with life | Quality of life | Subjective well-being | | | | | | | | |
| | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | |
| Urban GS | 4 | 2 | 1 | | | | 1 | 1 | 2 | | | | | | | | | | | | | | | | | | | |
| Park | 13 | 2 | 2 | | | | 4 | | 3 | 2 | 8 | 11 | | | 1 | 4 | | | | 1 | | | | | | | 1 | 1 |
| Garden | 2 | 2 | | | | | | | 1 | | 3 | 3 | 3 | 1 | 1 | | | | | | | | | | | | | |
| Forest | 18 | 8 | 3 | 4 | | | | 4 | 2 | 1 | 12 | 12 | 1 | | | 1 | | | | | | | | | | | | |
| Grassland | 2 | | 1 | | | | | | 1 | 1 | | 2 | | | | | | | | | | | | | | | 1 | |
| Trees & plants | 3 | 1 | | 1 | | | | 2 | | | 1 | | 1 | | | | | | | | | | | | | | 1 | |
| Biodiversity | | 1 | | | | | | 1 | 1 | | | 1 | 1 | | | | | | 1 | 1 | | | | | | | | |

GS = green space
 Note: numbers in cells reflect numbers of studies.

Source: WHO 2021, p. 16.

Table 2. Summary of mental health outcomes per green space category—cross-sectional and longitudinal studies

| | Short-term health | | | | | | | Long-term health | | | | | | | | | | | | | | | | | | | | |
|----------------|-------------------|---|----------|---|----------------------|---|------------------|------------------|----------------------|---|-------------------|---|----------------|---|---------------|-------------------------------|---------------------------------|------------------------|-----------------|-----------------------|---|---|---|---|---|---|---|---|
| | Affect | | Vitality | | Restorative outcomes | | Perceived stress | | Physiological stress | | Problem behaviour | | Brain activity | | Mental health | Severity of a mental disorder | Prevalence of a mental disorder | Satisfaction with life | Quality of life | Subjective well-being | | | | | | | | |
| | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | + | □ | - | |
| Urban GS | 1 | 1 | | | | 1 | | 1 | | | | | | | 1 | 1 | 1 | | | 1 | 1 | | | 3 | 1 | | | |
| Park | 1 | 1 | | | | | | 2 | 1 | | | 2 | 2 | | | 3 | 2 | 2 | | | 1 | | | 1 | 1 | 5 | 1 | 1 |
| Garden | | | | | | | | 1 | | | | | | 1 | | | | | | | | | | | | 2 | | |
| Forest | 2 | | | | | | | 1 | | | 1 | | 1 | 3 | 2 | 1 | | | 1 | 1 | | | 1 | 1 | | 2 | 1 | |
| Grassland | 1 | | | | | | | | | | | | | 1 | 2 | | | 1 | 1 | | | | | | 1 | 1 | | |
| Trees & plants | | | | | | | | 1 | 1 | | | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | | | | | | | | 1 | |
| Biodiversity | 1 | | | | | | | 1 | 1 | | | | | | | 1 | | | | | | | | 1 | | 1 | 1 | |

GS = green space
 Note: numbers in cells reflect numbers of studies.

+ Positive outcomes □ Neutral outcomes - Negative outcomes ■ 1-5 studies ■ 6-10 studies ■ 11-15 studies ■ >15 studies ■ 1-5 studies ■ 6-10 studies ■ 1-5 studies

Source: WHO 2021, p. 16.

Firstly, relatively few studies show negative outcomes from contact with green or blue spaces. The vast number of studies reveal either neutral or positive outcomes, across a wide range of well-being indicators—both short and long term. Of the papers reporting negative outcomes, just over 37.5 percent concern long-term mental health, as measured, for example, by the General Health Questionnaire, and the long-term severity of mental disorders (21.5 percent) as measured, for example, by the CES-D scale for depression. These are self-report questionnaires and not clinically verified. No studies revealed negative results concerning the prevalence of mental disorders. Of the 48 studies, a total of six (12.5 percent) found negative outcomes. These findings are of particular importance as the argument for green spaces often refers to mental health problems and their costs, and maintains that green-blue spaces are good for mental health and will help reduce spending on mental health. A total of 27 studies (56 percent) support this argument. A further issue is that studies

concentrate on types of green spaces rather than on their quality. This is also interesting, however, as it is clear that no one type of green space stands out as ‘the answer’. All types of green space have been found to have beneficial effects in at least one study. Turning to blue spaces (coasts, inland water, marine areas), the review found far fewer studies that were eligible—only 25. The majority concerned coastal areas, which were found to have positive benefits, with actual exposure rather than proximity being significant. Thus, while the overall picture is positive, there is undoubtedly a need for further research. Indeed it should also be mentioned that the majority of experimental studies have been carried out on student populations, which are not representative of the population as a whole.

The WHO’s findings concur with Mensah et al.’s (2016) review of the green space literature:

Green spaces were found to provide various social, economic, and environmental benefits, which in turn improve physical, psychological, emotional, social, and material wellbeing of individuals and thus enhance quality of life. It is therefore strongly recommended that conservation of green spaces should be integrated into national health, environmental and socio-economic policies in order to promote effective utilisation of green spaces to enhance citizens’ overall quality of life (p. 142).

We only get part of the way to an argument stating that biodiversity matters for mental well-being. A well-mown lawn drenched with pesticides might be just as good for mental health as an area flourishing with biodiversity. Within this literature, there has been relatively little research on the degree of biodiversity or conceptualizing biodiversity. That which exists tends to see a positive relationship (de Vries and Snep 2019, Aerts et al. 2018, Ha and Kim 2021, Fuller et al. 2015, WHO 2021). However, not all biodiversity is straightforwardly visible to the eye or understood across taxonomic groups. People often have poor biodiversity identification skills (Fuller et al. 2007, Dallimer et al. 2012). For example, one hedge or one type of soil might contain much more biodiversity than another. Experiments (e.g., Ulrich et al. 1991) using videos of green landscapes may capture differences in urban and green spaces, but beyond that, they have little to say about biodiversity. Trees along the side of the road increase well-being and *may* generate greater biodiversity, but little attention is paid to the kind of trees, how much biodiversity they encourage, whether or not they are beneficial in slowing climate change or reducing pollution or the effects of pollen on people’s health. As is now often underlined, it is important to plant the right tree in the right place (UNDP 2020). Greater insect biodiversity has been found to have neither a positive nor negative effect on well-being (Chang et al. 2016), but clearly, some insect types are of great importance—a malaria-carrying anopheles mosquito being a case in point. Contrariwise, the evidence does not give fuel to the opposite view, namely, that increased biodiversity is necessarily worse for human well-being (WHO 2021). Arguments for biodiversity have to be supported on other grounds—to wit, reversing biodiversity loss.

The green-blue space literature has several limitations. Firstly, it has concentrated on visual stimuli rather than auditory stimuli, although an increase in bird songs has been associated with increased well-being (Marselle 2019, Zhang et al. 2017, Ratcliffe et al. 2016). Furthermore, the tactile effects of nature are seldom researched. There have been few studies on the possible effects of the wind (Bos et al. 2012). Evidence indicates that panic attacks have been linked to meteorotropism (Bulbena et al. 2005).

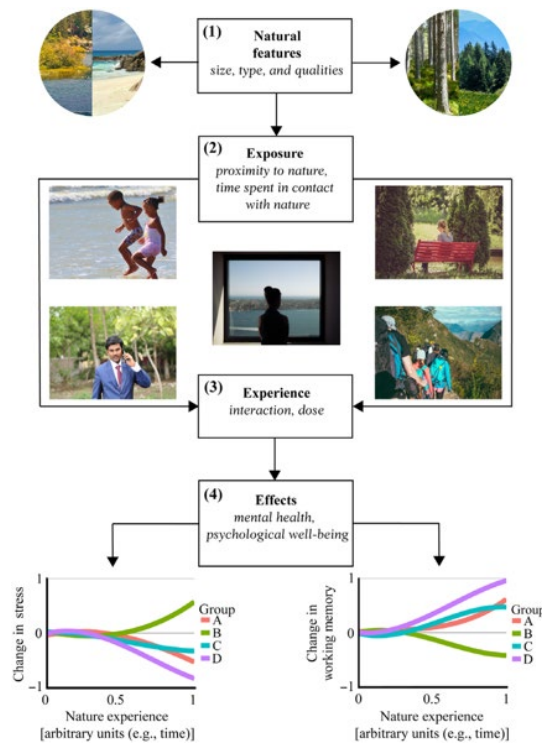
Secondly, surprisingly little research has taken changing seasons into consideration. This is the case even though seasonal affective disorder, which is a recurrent major form of depression that only occurs during the autumn and winter seasons, is a recognized disorder strongly related to light (Winthorst et al. 2017). The weather is a significant factor determining people's possibilities for enjoying green or blue spaces.

Thirdly, the green-blue literature has not considered deserts or arctic regions where green and blue may not be the dominating colours or types of landscape. Interestingly, Sagie et al. (2013) studied Israeli and Jordanians living in close proximity to one another in the desert. Both groups described the importance of the desert to their well-being. One Jordanian man said, "Many people go with a donkey to the desert for a few days to change, to relax, to think" (ibid. p. 42). A qualitative study carried out by Brooke and Williams (2021) suggests that the cryosphere—glaciers—can have a therapeutic effect on well-being. Willox et al. (2013) document the importance of ice to the well-being of the Innuits in Canada. Clearly, this is an area for further research, but it strongly suggests that the well-being benefits of green-blue areas are also linked to other factors such as culture and a sense of belonging.

Green-blue spaces and ecosystems services

Bateman et al. (2019) provide an ecosystem services model of how nature (green and blue spaces) affects people's cognitive functioning, emotional well-being and mental health. The model is to be understood as a work in progress that can be developed both in terms of theory and much-needed empirical evidence. The IPBES approach, with its focus on nature's contribution to people, has criticized the ecosystem services approach is that the latter has concentrated on economic evaluation rather than other values that people have (Díaz et al. 2018). In this sense, Bateman et al.'s (2019) approach is non-mainstream as it emphasizes that other values can be taken into consideration. Perhaps more importantly, the concept of ecosystem services concentrates on the benefits—services are defined as benefits—that nature has for people and not its *disservices* and threats, which are captured by the three-circle model discussed above. The approach is outlined in Figure 2.

Figure 2. A conceptual model for mental health as an ecosystem service



Source: Bratman et al. 2019.

The model entails an understanding of the relationship with nature that starts with ecosystems and moves through to mental health and psychological well-being. As Bateman et al. (2019) assert, most studies have gone straight from “the amount of contact that an individual or population has with nature” (p. 14).

A variety of well-being indicators (hedonistic and eudemonic as well as of mental disorders) have been used. Importantly, and unlike many other studies, Bateman et al. (ibid.) underline the fact that multiple mechanisms may impact a person’s well-being. Step 3 in the model concerns experience, which includes the sensory qualities of nature and the senses they relate to. Bratman et al. (ibid.) divide this category into interaction, such as the difference between looking at or swimming in water, and dose or absorbed dose, as two people can absorb the same dose differently (for example, a child’s upbringing can affect how she relates to nature and whether or not she passively absorbs it).

From a nature-based human development perspective, two points should be made. Firstly, step 1 seems to imply that nature is untouched rather than cultured, either in the way it has been used and valued (e.g., for its awe, sacredness or provisioning) or in how we are related in terms of belonging. Secondly, most crucially for

the Anthropocene, it is important to capture the dynamic interaction between nature and humans. We should also remember the possible negative consequences of people's use of nature. An example here is that people walking in nature during the pandemic at times disturbed nature, as was the case with the capercaillie (*Tetrao urogallus*) during its breeding season (the capercaillie is on the United Kingdom's Red List of endangered species). A further example was the large number of visitors to the Lake District in the United Kingdom. This caused considerable erosion in part due to the need to social distance (*The Guardian* 2021b). In addition, much research is interested in the consequences of our experience of nature in terms of pro-environmental behaviour (Alcock et al. 2015), and consequently, for example, climate change, and in turn the effects on people's well-being, which could be seen as increasing nature-based security. A third point is that there is no discussion of prioritization or conflicts concerning the use of nature (such as land ownership versus tourism on the Serengeti Plains). Lastly, there is no discussion of the ethical issues surrounding our use of nature (such as animal or ecosystem rights). These issues suggest the development of a framework that offers an alternative to the ecosystem services approach.⁸

The case of the COVID-19 disaster and the United Kingdom

This paper now turns to a case study of the United Kingdom, chosen because of the relative availability of data concerning mental well-being, green and blue spaces, and the use of those spaces during the pandemic. Although complete lockdowns severely limited the usage of green and blue spaces, there was encouragement to do so from many sides—the Government, environmental non-governmental organizations and mental health organizations. This section begins by looking at the root causes of the pandemic in the United Kingdom before discussing the significance of different groups (age, gender, ethnic background, economic security, minority groups and those on the front lines) and how they were affected at various stages during the pandemic. The section ends by looking at the use of nature during the pandemic, including the reasons for not visiting nature.

AUSTERITY AND THE ROOT CAUSES OF THE PANDEMIC IN THE UNITED KINGDOM

Initial risk factors for becoming seriously ill with COVID-19 included age and underlying conditions, and the risk of contamination, for instance, among front-line workers and people in close contact. All these factors are social factors with underlying social root causes (Marmot 2020, Venkatapuram 2020, Biggeri 2020). In the United Kingdom, the root social causes lie in government economic policy aimed at reducing expenditure. Through austerity measures, public expenditure dropped from 42 percent of GDP in 2009-2010 to 35 percent

⁸ While the IPBES concept of nature's contribution to people emphasizes some of these points, it has little to say about ethics and rights.

in 2019 (BMA 2020). This reduction had ramifications for health and life expectancy, which is no longer rising, together with an increase in social inequalities. In brief, as summed up by the Marmot Review:

From rising child poverty and the closure of children’s centres, to declines in education funding, an increase in precarious work and zero hours contracts, to a housing affordability crisis and a rise in homelessness, to people with insufficient money to lead a healthy life and resorting to food banks in large numbers, to ignored communities with poor conditions and little reason for hope... Austerity will cast a long shadow over the lives of the children born and growing up under its effects (Marmot 2020. p. 5).

According to the British Medical Association, at the start of the pandemic, 80 percent of English hospitals were already at dangerously low capacity, with low staffing levels, and insufficient numbers of ventilators, protective equipment and testing capacity. Thirty-five per cent of doctors were suffering from stress, anxiety, depression or burnout (BMA 2020).

Preparation for the next pandemic will have to address the root causes of vulnerability and will require changes in government spending and economic policy. Yet the Government may rely on technological fixes. As the former Secretary of State for Health and Social Care Matt Hancock stated, “That is at the core of what this Pandemic Preparedness Partnership is all about. And looking at the part that all of us can play in improving and streamlining vaccines, therapeutics and diagnostics, so we’re better prepared for future pandemics” (Hancock 2021). Not surprisingly, root causes of vulnerability affect groups at high risk, namely, older people, the unemployed, front-line workers, those with underlying diseases and mental health problems, minority groups and people affected by gender inequalities.

COVID-19 AND ADULT MENTAL HEALTH IN THE UNITED KINGDOM

Firstly, a word of caution: While a significant number of studies and reports have tracked mental health outcomes from the start of the pandemic to date, for good reasons, data quality has been affected by the fact that many studies rely on online, self-assessments that are not verified by a clinician. Furthermore, the instruments used are varied, which means that one study is not directly comparable with another, comparisons to pre-COVID-19 situations cannot always be established, and, moreover, some mental health disorders have received more attention than others. For example, a recent government review of the literature did not include any studies concerning obsessive compulsive disorder although cases were expected to increase given hygiene advice (Fineberg et al. 2020, Jassi et al. 2020). That said, some clear patterns emerge. Firstly, mental health problems increased across a spectrum of conditions. Secondly, the situation was worst during total lockdowns. Thirdly, there is strong evidence that connection to health services was substantially reduced. Thus, triangulating data is problematic (Mansfield et al. 2021).

The human security approach stresses the interconnectedness of types of security. This is borne out by epidemiological evidence. Gillen et al. (2022) found that approximately 33 percent of health-care workers had moderate to severe levels of anxiety (28 percent), depression (33 percent) and post-traumatic stress disorder (15 percent). These issues were linked to a lack of protective equipment and pressure to work without protective equipment, a higher workload, specific traumatic events, not being able to do enough, inadequate training, and worries about workers' own families and the possibility of passing COVID-19 on to them (similar problems were found by Murphy et al. 2020, Ayling et al. 2020 and Chen et al. 2021).

Greene et al.'s (2021) study of 11,194 health-care and social workers found that just under 60 percent met the threshold for clinically significant disorders, including post-traumatic stress disorder (22 percent), anxiety (47 percent) and depression (47 percent). Key factors included being worried about infecting others, the inability to discuss concerns with their managers and problems with coping. Stigmatization and insufficient supplies of personal protective equipment were also central issues. Coping strategies for just under a third of the respondents included the use of alcohol, cigarettes or 'other substances'. A smaller sample of 387 health-care workers in West London revealed similar maladaptive coping strategies. Among them, emotional exhaustion was experienced by 52 percent and the same percentage suffered from insomnia. These figures perhaps reflect the 'good will' the National Health Service is said to run on. Curiously, 70 percent were found to be resilient but as many as 25.9 percent had suicidal thoughts (Pappa et al. 2021, see also Gilleen et al. 2021).

ECONOMIC SECURITY: LOW INCOMES AND UNEMPLOYMENT

Prior to the pandemic, psychological distress for those on Universal Credit, a change in benefits introduced by the Government in 2013, had increased 6.5 percent from 2013 to 2017 (Wickham et al. 2020). Problems have been magnified since the start of the pandemic. A report by the National Centre for Social Research (NatCen 2022) found that those seeking help either via self-employment support or the Universal Credit, among whom Black, Asian and minority ethnic (BAME) people were twice as likely as Whites to be represented, had a 13 percent increase in mental distress. Fourteen percent of those with multiple struggles, such as people with financial problems who sought non-work based financial support, were diagnosed with a mental disorder from May 2020 to January 2021. The Coronavirus Job Retention Scheme (often referred to as a furlough) provided a degree of economic security and some protection against mental health problems (NatCen 2022). A lack of financial security was also mentioned as problematic for mothers during the first lockdown (Dickerson et al. 2020a, 2020b).⁹

⁹ On the case of the United States, see a 2021 report by McKinsey, *How Affordable Is Mental Healthcare: The long-term impact on financial health*: <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/how-affordable-is->

PROVIDING SECURITY: CARING FOR CHILDREN

As in many countries, lockdowns meant that most children were unable to attend nurseries and schools; school activities were moved online. Not only did this place a stress on children, but it also meant that in many cases, parents had to take on many new tasks in addition to working from home, which was stressful in itself. Isolation also meant that parents were unable to draw on family and friends to care for their children as they would have done under normal circumstances. Furthermore, women usually had to do most of the household chores (Xue and McMunn 2021). Single mothers faced particular hardships, leading to high levels of distress as they had to cope with all these issues and were less likely to have a car, factors that resulted in higher rates of depression during the first lockdown than normal (Xue and McMunn 2021, Zhou et al. 2020). Generally speaking, parents showed greater levels of anxiety and stress in the first lockdown. Financial and food security also played a role (Dickerson et al. 2020a). A study in Bradford found that 20 percent of families reported inadequate food security, with 9 percent stating that they regularly had to cut down on food or skip meals (Dickerson et al. 2020b). A number of parents emphasized the importance of gardens and parks as a coping strategy, as was taking time alone (Dawes et al. 2021).

SECURITY AND GENDER

Linked to the above, women have faced greater challenges than men, showing higher levels of depression, anxiety and loneliness, and lower levels of life satisfaction and happiness. Data suggested that women were more worried about being infected or becoming seriously ill from the virus, and about the ability of the health service to cope (such worries might have been less if austerity measures had not been taken). There were no gender differences in stress levels related to finance, employment or access to food. Thoughts about death or self-harm, reported self-harming and reported abuse were similar irrespective of gender (UCL 2020). Internationally, there have been reports of homicide associated with family violence in several countries. Assessing family violence is problematic during normal circumstances as there is underreporting (Bradbury-Jones et al. 2020). Yet one important indicator was that the National Domestic Abuse Hotline in the United Kingdom registered a 25 percent increase in calls during the first lockdown (Kelly and Morgan 2020).

AGE: A SECURITY PARADOX?

Age and underlying health conditions are two major risk factors for death or serious illness from COVID-19. Those at high risk were asked to shield themselves. Consequences for young people have been, generally, comparatively mild. One might therefore expect older people to have higher levels of psychological distress, along with those with underlying health problems (Lob et al. 2020). Paradoxically, young people have been found to have higher levels of anxiety and reduced well-being, which have manifested in ways that include self-

[mental-healthcare-the-long-term-impact-on-financial-health?cid=podcast-eml-alt-mip-mck&hdpid=b93211d1-4d5a-4901-8794-4585ea19bd80&hctky=12215521&hlkid=af3cc](https://www.who.int/news-room/podcasts/mental-healthcare-the-long-term-impact-on-financial-health?cid=podcast-eml-alt-mip-mck&hdpid=b93211d1-4d5a-4901-8794-4585ea19bd80&hctky=12215521&hlkid=af3cc).

harming. These patterns may be higher among BAME populations (Jia et al. 2020, Kwong et al. 2021, Deng et al. 2020). A report by the Association for Young People’s Health (2021) pointed to a number of factors, primarily, financial hardships (more than 400,000 additional households with dependent children claimed the Universal Credit in April and May 2020) and job losses that were substantially higher among those aged 16 to 24 compared to any other age group. Sexual exploitation, which according to one study increased by 69 percent within the first 10 weeks of the lockdown (Kooth 2020), parental problems, school and higher education exam pressures, and loneliness were other issues.¹⁰

CHILDREN AND YOUNG PEOPLE

There are relatively few large-scale studies of children’s mental health during the pandemic (Newlove-Delgado et al. 2021). Two stand out as particularly relevant: the National Health Services survey on children and young people, which has a pre-pandemic baseline (2017) and has been carried out in two waves since then (2020 and 2021), and the surveys of YoungMinds, a charity, which are aimed at children already known to have difficulties, and have been carried out in four waves.

The Mental Health of Children and Young People Survey offers a comparison of the mental health of children, following the same children. Thus, the initial survey in 2017 was based on a random sample of 9,117 children and young people aged 2 to 19.¹¹ The 2020 sample was based on those from the 2017 group who agreed to be involved in future research (3,570 participants). The initial group and 2020 group were then the basis for the 2021 sample (3,667 participants). Children were followed throughout the period; the initial group of 2 to 19 year-olds in 2020 was then grouped as those aged 6 to 19 with an additional group of those aged 20 to 22, and a group of 23 year-olds in 2021. Only the first interviews were carried out face to face, and only the Strengths and Difficulties Questionnaire was used in all three waves. No diagnoses were made; the report talks of ‘probable disorders’.

The main increase in probable disorders took place from 2017 to 2020. In fact, there were no statistically significant differences between 2020 and 2021. From 2017 to 2021, there was a rise in probable disorders from 11.6 to 17.4 percent among boys and girls in the 6 to 10 age group, and from 10.1 to 17.4 percent in the 17 to 19 age group. In 2021, the share was just under 20 percent of the group of 21-22 year olds. The nature of the surveys allowed for disaggregation to the individual level. This showed that almost 40 percent of children aged 6 to 19 in 2021 had seen their mental health decline but almost 28 percent registered improvements. Of the 11 to 16 year-olds, girls (43.4 percent) were more likely than boys (34.4 percent) to have increased problems.

¹⁰ Similar findings have emerged in Germany and the United States. A ‘developmental stage’ explanation points to the importance of social relationships and activities, such as parties and concerts, and the fact that many young people live alone (Gunnarsson et al. 2020).

¹¹ Parents were also involved in the surveys of younger children.

Rates were substantially lower in Asian/Asian British (8.4 percent) and Black/Black British (8.2 percent) than White British (18.9 percent) and other groups (22.5 percent). Almost 57 percent of children in special education and those with disabilities had a probable disorder, up by approximately 13 percent. Problems related to eating, sleeping and loneliness all increased. There were no major changes in substance abuse among 11 to 16 year-olds; the vast majority did not use alcohol, cigarettes or drugs. There were no statistically significant changes with respect to social media use despite increased time online.

Mental health problems were serious prior to the start of the pandemic. Roughly 8 percent of children had a mental disorder, or, to put it in perspective, three children in every classroom. Suicide was the most common cause of death for both boys (16.2 percent of all deaths) and girls (13.3 percent) between the ages of 5 and 19. Self-harm is pervasive among 17 to 19 year-olds with a mental disorder. Thirty-three percent of adults with mental disorders had the roots of their disorders in childhood. Mirroring the situation worldwide, only 1 percent of the National Health Services' budget is spent on young people's mental health; in general, support is inadequate (YoungMinds 2021). Again, problems have their roots in government economic policy.

YoungMinds has undertaken surveys of young people at four stages during the pandemic. The surveys were aimed at evaluating the impact on young people with a history of mental health problems. In addition to establishing whether their situation had become worse, the surveys explored coping and support. The first covered 2,111 young people and was carried out from 20 to 25 March 2020 during the first lockdown, when schools were closed for the first time and additional restrictions were introduced. In theory, schools were open to those who absolutely needed to attend, including children with "Educational and Health Care Plans for their Special Educational Needs and Disabilities and 'vulnerable children' and young people on the child protection register (i.e., children in families with intervention for abuse and neglect)" (Holt and Murray 2021, p. 4).

The second survey was carried out when the first set of restrictions was eased (6 June to 5 July) and there was hope that schools would reopen for the autumn term. The survey included 2,036 young people. The third survey included 2,011 young people and was undertaken from 15 to 30 September, when schools had just reopened. The fourth survey was carried out from 26 January to 12 February 2021 during the second lockdown. It included 2,438 young people. The surveys reflect patterns and problems in human security. Preventing the threat to bodily security, which was prioritized by the Government, significantly increased the threat to mental health in a variety of ways, including due to a lack of food security and job losses against a background of an over 20 percent reduction in GDP in the second quarter of 2020.

The surveys are particularly important in providing a picture of the lives of young people who already had problems. Longitudinal analysis reveals how problems have changed. For example, young people were worried about food at the start of the first lockdown but apart from those who had eating disorders, this problem was not mentioned later. This is interesting, as food security was a serious issue for children in the United Kingdom

(Holt and Murray 2021) and was highlighted by YoungMinds in surveys reflecting varying uncertainties and worries about the future.

A summary report on the surveys revealed how undertaking surveys during COVID-19 was problematic. The surveys were carried out by telephone and some respondents found it difficult to speak, not least when their problems were related to the situation at home. Given the lockdown, it is expected that the number of child abuse cases would increase as children were isolating together with their abusers (*ibid.*). As with adults, however, the exact situation is hard to assess given the difficulties young people had speaking. Commonly, home abuse is revealed at school, but as schools were locked down, this was no longer a possibility. Prior to the pandemic, an estimated 2.2 million children were in households affected by the ‘toxic trio’ of domestic abuse (800,000), parental drug and/or alcohol dependency (478,000) and severe parental mental health issues (1.6 million). An estimated 100,000 lived in a household where all parts of the toxic trio were present. The National Domestic Abuse Helpline saw the number of calls rise by 80 percent in June 2020. Alcohol Change UK, which provides help for people with alcohol problems, experienced a 400 percent increase in the number of people seeking help (Children’s Commissioner 2020).

All surveys revealed that a large percentage of respondents answered that their mental health had become worse than before the pandemic (80 percent or more). In the first survey, 32 percent stated that it had become much worse. This figure increased to 41 percent by the time of the second survey. A small percentage stated that mental health had improved. In such cases, this was due to their problems mainly being related to their situation at school.

Previous studies of disasters (Norris et al. 2002a, 2002b) have revealed that losing social networks can be a major cause of mental health problems. Conversely, social networks can play a major role in preventing problems. This is not surprising as humans are social beings. This has also been the case during the pandemic. A major problem revealed by all four surveys was that young people’s social networks were threatened. Isolation and loneliness were major themes as were worries about losing friends. Thus, the second survey revealed that 87 percent of respondents had felt lonely or isolated during the first lockdown, even though 71 percent remained in contact with friends. Connectedness with friends was the main coping strategy. While most children were happy to return to school, especially those with Internet problems, doing so could also be problematic due to worries about social distancing (or the lack thereof) and possible contagion. Some young people were worried about friendships not being continued. Fifty-eight percent said that seeing classmates (not the same as friends) had a positive effect; 30 percent said it had a negative effect; 12 percent said it had no effect.

Problems arising from being away from school related in particular to structures and routines that normally helped distract people from their own negative thoughts. Anxiety around schoolwork and exams increased

over time as did fears about the future. Some young people found a loss of purpose. Responders were also worried about their future mental health, with 67 percent believing that the pandemic would have a long-term negative effect and that their adult life had become increasingly uncertain. There was common agreement that the second lockdown was the worst, with 75 percent saying that it was harder than the previous one.

Many respondents were worried about family health and the possibility that they might transmit the disease, especially if family members were in high-risk groups. Issues concerning bereavement began to surface in the second survey.

Throughout the pandemic, a number of coping strategies were used, such as face-to-face calls with friends, watching TV and films, exercise and breathing techniques. Watching the news had both positive and negative effects. Many respondents felt stigmatized as young people (and specifically, as ethnic minorities, who were being blamed for the transmission of COVID-19). Being in nature was barely mentioned as a positive coping strategy, which is not surprising as people during the first lockdown were only allowed one outing a day and many parks were closed (Holt and Murrey 2021). There was no mention of watching nature videos, looking at plants or gazing out the window. Nevertheless, many pointed to shorter, colder or freezing days during the second lockdown as having a significantly negative effect on their mental health as it disrupted their routines and chances of doing exercise. This was compared to the first lockdown when it was sunny and warmer, which suggests that subconsciously nature was playing a role.

Support from mental health services, schools, general practitioners and university counsellors was affected by the pandemic. Some activity was moved online or took place via phones, but throughout the entire period, approximately 25 percent of respondents who would have liked support did not have any at all. Private support was expensive and peer group meetings stopped. In some cases, young people had not told their families that they were receiving support, making it difficult to continue during lockdowns.

OLDER PEOPLE

The category of 'older people' is vague as different research uses varying ages despite people having vastly different situations and capabilities. Prima facie placing 50-year-olds upwards in one group seems questionable given the different opportunities and obstacles people face. The Government of the United Kingdom's Age Spotlight examined the situation of older people defined as 60-plus. Despite the fact that this age group was generally considered at risk, measures of depression, anxiety, self-harm and thoughts of death were all lower for them than for any other age group from the start of the 2020 lockdown (calendar week 13) until restrictions were eased (calendar week 29). These numbers also reflect the pre-COVID-19 situation. Measures of loneliness and life satisfaction were the same for all groups.

A survey in England of 5,820 people aged 52 or older from 3 June to 26 July 2020 showed that people with impaired activities of daily living (ADL) had clinically significant symptoms of depression, anxiety and loneliness (Steptoe and Di Gessa 2021). Similar findings were obtained by a survey carried out for Aging Better, a non-governmental organization. Among people aged 50 to 70, 36 percent stated that their mental health had become worse since the start of the pandemic, with pre-existing health conditions and job and financial insecurity adding to stress and anxiety. The need to remain indoors was another major stressor.

Age UK has produced two reports concerning mental and physical health and the pandemic. The first was based on two surveys, one a representative sample of 1,364 people over age 60, almost half of whom were over age 70. The other survey took place on social media with 569 respondents; 200 answered on behalf of an older person. Half the people in the sample were over age 70. The research was undertaken during the summer and revealed that respondents were clearly concerned about the winter months, the bad weather and longer dark nights. As such, it provides a clear message for the green-blue literature, which commonly does not take the seasons into account. Furthermore, Age UK is acutely aware of the specific problems that affect older people. Thus, there is a particular concern about mobility and movement, with 25 percent of older people reporting that they were unable to walk as far as they could prior to the pandemic. Twenty percent felt less steady on their feet, resulting in, among other consequences, weight increases, which made them feel more depressed. Twenty per cent of those interviewed stated that it had become more difficult to remember things since the start of the pandemic due in part to the lack of stimulation. Cognitive problems increased. Eighty-two per cent of people suffering from Alzheimer's experienced a worsening of symptoms. There were increased reports of anxiety, not least related to the possibility of catching COVID-19 when leaving home. Feelings of depression and meaninglessness resulted from loneliness. BAME people were at greater risk in part because of significantly higher mortality rates.

The second report included surveys carried out in February and March 2021. These comprised a representative survey of 1,487 people over age 60, and a survey via social media of 14,840 people, over 70 percent of whom were over age 70. An in-depth qualitative study was also undertaken. Mobility was again highlighted. Forty-two percent who had already experienced difficulty in getting up and down the stairs found it more difficult to do so. An estimated 2.9 million people said they were living in more pain than prior to the pandemic. This too has consequences for mobility and the freedom to visit green or blue spaces.

Thirty-six per cent said they were more anxious. An estimated 6.9 million people felt less motivated and, implicitly, less likely to lead the lives they valued prior to the pandemic. People felt isolated and had a loss of confidence. Twenty-two percent found it more difficult to remember things compared with the start of the pandemic. People had problems with loss and grief, and in some cases were unable to be together with significant others when they died. Those from lower social grades had considerably more problems compared

with those from higher social grades. For example, 18 percent from higher social grades had memory problems; the corresponding figure for lower social grades was 25 percent. Thirty-one percent from lower social grades found it difficult to walk as far compared to their pre-pandemic situation. The figure was 21 percent for higher social grades. People from BAME backgrounds had magnified problems. For example, 27 percent were less confident going for a walk compared to 19 percent of those who were White.

MINORITY GROUPS

Specific research on BAME groups has tended to have such small samples that any generalizations tend to be difficult. Nevertheless, the overall picture is that BAME groups suffer more than White British (Government of the United Kingdom 2021). They have worse mental health across every measure, with higher rates of depression, anxiety, concerns about employment, financial stress, thoughts of death or self-harm, reported abuse and loneliness, and lower life satisfaction and happiness (UCL 2020). One study that particularly concentrated on the BAME population compared self-assessed depression in a sample taken both before the start of the pandemic and during the first lockdown. The results suggest that all groups (White males, women and BAME) had symptoms of depression. Women, irrespective of ethnicity, and BAME men showed increased mental distress—in other words, the gap was between White males and other groups (Proto and Quintana-Domeque 2021). This was irrespective of other socioeconomic factors. The tentative hypothesis was that the difference resulted from the diverse effects of social distancing, which reflected cultural disparities under normal circumstances. This is clearly grounds for further research. As a result of the original outbreak starting in China, there have been reports of discrimination against Chinese (Usher 2020; see also Jaspel and Lopes 2021). Research on LGBTQ+ (lesbian, gay, bisexual, transgender, queer plus) people is missing (Gorczyński and Fasoli 2020, McGowan et al. 2021). The needs of sex workers have also been ignored (Howard 2020).

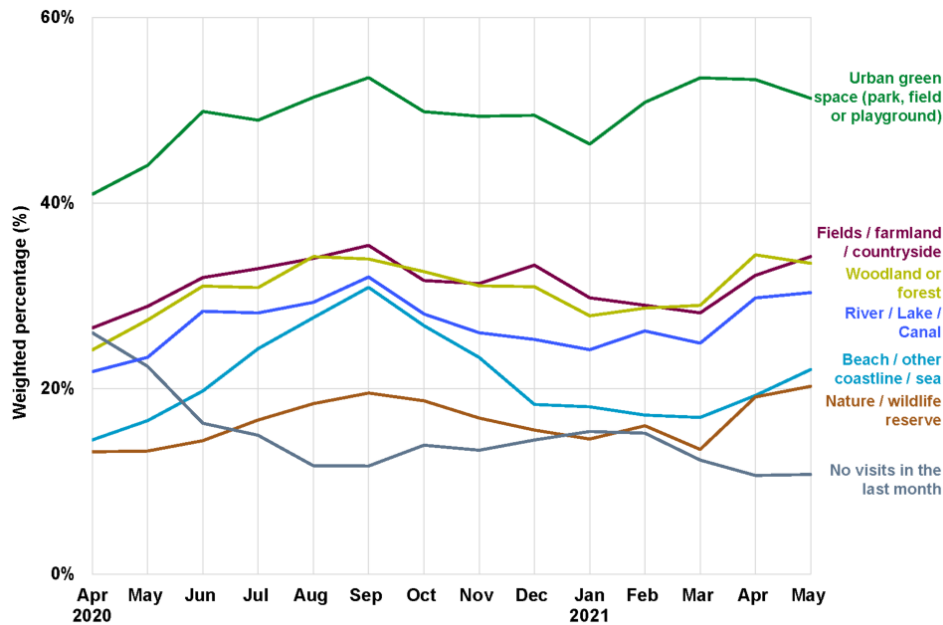
NATURE-BASED SECURITY AND COPING WITH THE PANDEMIC

Natural England carried out a regular people and nature survey tracking people's use of and attitudes towards nature during the pandemic, with different surveys used for adults (aged 16 and up) and children (aged 8 to 15). More than 40 percent of adults stated that nature and or wildlife and natural spaces had been of increased importance since the first restrictions were introduced. Eighty-nine percent agreed or strongly agreed with the statement that: "In general, green and natural spaces should be: Good places for mental health and wellbeing." Only 3 percent disagreed or strongly disagreed.

Nature was used differently. Given the fact that most people live in urban areas, it is not surprising that urban green spaces were most frequently visited. Furthermore, given the pressure on nature that large numbers of visitors create, there are clear policy implications, namely in increasing the amount of urban green space. In addition, it is clear that natural spaces are used in multiple ways (playgrounds, parks, fields; see Figure 3), which means that urban planning needs to account for these. When asked about the period from April 2021 to March

2022, 78 percent of respondents said they went for a walk (including walking a dog), 24 percent said they watched wildlife, 12 percent ate out or had a picnic, 11 percent played with children and 10 percent went for a run or a bike ride.

Figure 3. Usage of different green and blues spaces during the COVID-19 pandemic



Source: Natural England 2021.

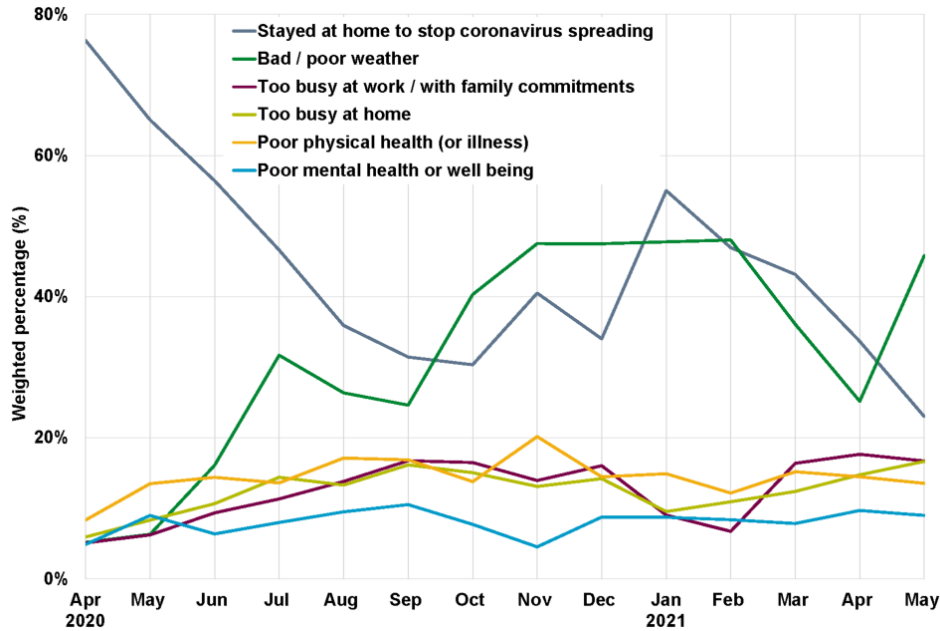
Work on a ‘dose of nature’ has suggested that 120 minutes a week is optimal for well-being (White et al. 2019). This finding was taken up by Canadian doctors who prescribed a dose of nature during the pandemic (Fielding 2022). Not surprisingly, time spent in nature was lowest during the lockdowns and highest during the summer holidays in August, but otherwise, approximately 11 percent of respondents said that they did not visit nature.¹²

The Natural England surveys also asked people why they did not use green spaces (Figure 4). The main reason was a question of security—stopping the spread of COVID-19. In addition, poor weather, not taken into consideration in the green-blue literature, saw a substantial increase as a reason during the winter months. A significant number of people did not visit nature due to their low well-being or poor mental health—a group who, if the theory is correct, need it most. There is an important unanswered question here as to whether this group correlates well with those within the mental health surveys who stated they had suffered severe mental health problems since the start of the pandemic. Household income levels also played a major role, with 75

¹² The survey defines green and natural spaces as “green and blue spaces in towns and cities (e.g. parks, canals); the countryside (e.g. farmland, woodland, hills and rivers); the coast (e.g. beaches, cliffs) and activities in the open sea; visits of any duration (including short trips to the park, dog walking etc.). They do not include: gardens; outside spaces visited as part of someone’s employment; spaces outside the UK” (Natural England 2021).

percent of those earning at least £50,000 visiting a green or natural space compared with 44 percent who were earning less than £15,000.

Figure 4. Reasons for not visiting nature



Source: Natural England 2021.

Natural England undertook an online survey of 1,501 children aged 8 to 15 in August 2020, at which stage England was not locked down. Forty-eight per cent of children stated that they had remained at home because of worrying that they could catch or spread the virus. Eighty-three per cent said that they were happy as a result of being in nature; 94 percent stressed that a deeper engagement with wildlife/noticing nature increased their happiness. Yet 81 percent said they had spent less time outdoors together with their friends. Looking to the future, 44 percent would like more time outdoors when at school. The seaside (27 percent), woodland (26 percent) or countryside (24 percent) were infrequently visited, reflecting the urban nature of children’s lives.

There were inequalities in access with a much higher proportion of children from ethnic minority backgrounds (71 percent) spending less time outside. The corresponding figure for White children was 57 percent. Seventy-three percent of children from low-income households (annual income of £17,000 or less) spent less time outdoors; the corresponding figure for children in households with an annual income above £17,000 was 57 percent. Eighty-two percent stated they wanted to do more to protect the environment. This concern applied to all children irrespective of age, region, ethnicity, social status or annual household income.

REAL FREEDOMS: ACCESS TO NATURE, ACCESS TO SECURITY

By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.

—Sustainable Development Goal 11, target 7

There is a positive overlap between this work and the Sustainable Development Goals. If nature can play a role in preventing ill-being, access to nature is of crucial importance. The human development approach stresses the real freedoms people have to lead valued lives. A fundamental question therefore is: Do people have real access to nature? Much of the green-blue literature measures mental health and distances to green and blue spaces for the average person. Yet many people are not average. For instance, they might have health conditions that hinder mobility or present barriers to safely crossing roads.

Access to nature in Britain is unevenly distributed. Government figures reveal that only 12 percent of British households have no access to either a private or a shared garden. The percentage is higher in London at 21 percent. People in London are most likely to live within a five-minute walk to a park (44 percent). Furthermore, there are major differences among ethnic groups with Black people being four times more likely than White people to be without a garden. These variations remain across demographics, with young people less likely to have gardens, and based on socioeconomic status. Employment is a significant factor; 20 percent of unskilled manual workers, casual workers and the unemployed are without a garden, whereas the figure is only 7 percent of those employed in managerial, administrative or professional occupations.

An estimated 28 percent of British people live within 300 metres of a park and 72 percent live within 15 minutes of a park. If playing fields are also taken into account, then 52 percent of people live within 300 metres and 95 percent within 900 metres of either a park or a playing field. In the poorest areas, 57 percent of people live within a five-minute walk to either a park or playing fields. While these data provide a general picture, they are based on general survey mapping and do not necessarily reflect actual access. The human development approach has been concerned with the real freedoms people have to live lives they value. This can provide the basis for a more complex analysis. For example, there may be roads preventing young children or old people from getting to green spaces (lockdowns have meant reduced traffic and therefore greater safety on the streets). Moreover, a 15-minute walk may be a considerable effort for some people, including those with disabilities. All in all, put the other way round, 72 percent of people living in England live more than five minutes from a park and 28 percent live further than 15 minutes from a park, yet 86 percent of people in minority groups and 88 percent of Whites state that green spaces are within easy walking distance (Office for National Statistics 2020).

It is clear that a significant number of older people find it difficult to access green and blue spaces for reasons such as problems with walking, even though, in theory, a park might be only five minutes away. Such problems were exacerbated by the pandemic which led to a deterioration in physical health. Winter weather was also a complicating factor.

Access to nature is also determined by existing property rights. In many European countries (Austria, Czech Republic, Estonia, Finland, Iceland, Latvia, Lithuania, Norway, Sweden and Switzerland) people have the freedom to walk and camp in the countryside as a right. These entitlements have long histories. Scotland introduced a Land Reform Act (2003) that allowed similar possibilities, including cycling, horse riding, wild camping, rowing, sailing and swimming. Yet land property rights prohibit this kind of activity in England, and thus limit the real freedoms people have and the possible forms of connectedness with nature (Hayes 2020). Disabled people are even more restricted in using the countryside. More than 20 percent of England's population is unable to use rights to public ways (Natural England 2018).

Nevertheless, the interventions and solutions described above offer potential to initiate more permanent transformations in cities. Two major programmes that address such adjustments, post-COVID-19, are in Milan and Paris. The idea in both cases is that all citizens should be able to access all public amenities, including parks, in no more than 15 minutes by foot. Milan has also introduced play streets, which are free from cars, in areas with little green infrastructure (Hanzl 2020, McCunn 2020). In terms of accessibility, these initiatives plainly suffer from the same problems discussed above. Nonetheless, they can be seen as a step in the right direction.

Conclusion

In brief, this paper has argued for seeing human security through a nature-based human development lens. Doing so results in a very different view of personal security. It results in conceptualizing the vital core as including human-nature relationships as a basic need; therefore, we should acknowledge the *right to nature*. Relatedly, it introduces the concept of *nature-based security*. Mental well-being has seen disproportionately little attention at the international and national levels and within the human development and human security approaches (happily, this was emphasized in the *2022 Human Development Report*). The paper has shown how important nature can be for mental well-being and security in the current pandemic and beyond. Our relatedness to nature cannot be captured by income alone, but by a host of other factors and, not least, our unequal access to nature, which is also an issue of rights.

References

- Aerts, R., O. Honnay and A. Van Nieuwenhuysse. 2018. "Biodiversity and Human Health: Mechanisms and evidence of the positive health effects of diversity in nature and green spaces." *British Medical Bulletin* 127(1): 5-22.
- Alcock, I., M. P. White, R. Lovell et al. 2015. "What Accounts for 'England's Green and Pleasant Land'? A panel data analysis of mental health and land cover types in rural England." *Landscape and Urban Planning* 142: 38-46.
- Alkire, S. 2005. *Valuing Freedoms: Sen's capability approach and poverty reduction*. Oxford University Press.
- Association for Young People's Health. 2021. "Summerising What We Know So Far About the Impact of Covid-19 on Young People." <https://www.youngpeopleshealth.org.uk/wp-content/uploads/2021/02/Impact-of-Covid-19-on-young-people-briefing.pdf>.
- Ayling, K., R. Jia, T. Chalder et al. 2020. "Mental Health of Keyworkers in the UK during the COVID-19 Pandemic: A cross-sectional analysis of a community cohort." *medRxiv*.
- Biggeri, M. 2020. "Introduction: Capabilities and Covid-19." *Journal of Human Development and Capabilities* 21(3): 277-279.
- Blaikie, P., Cannon, T., Davis, I. and Wisner, B., 2014. *At Risk: Natural hazards, people's vulnerability and disasters*. Routledge.
- BMA (British Medical Association). 2020. "Austerity: COVID's little helper." <https://www.bma.org.uk/news-and-opinion/austerity-covid-s-little-helper>.
- Bos, E. H., R. Hoenders and P. de Jonge, P. 2012. "Wind Direction and Mental Health: A time-series analysis of weather influences in a patient with anxiety disorder." *Case Reports*, bcr2012006300.
- Bradbury-Jones, C., and L. Isham. 2020. "The Pandemic Paradox: The consequences of COVID-19 on domestic violence." *Journal of Clinical Nursing*.
- Bratman, G. N., C. B. Anderson, M. G. Berman et al. 2019. "Nature and Mental Health: An ecosystem service perspective." *Science Advances* 5(7): eaax0903.
- Brooke, K., and A. Williams. 2021. "Iceland as a Therapeutic Landscape: White wilderness spaces for well-being." *GeoJournal* 86(3): 1275-1285.
- Bulbena, A., G. Pailhez, R. Acena et al. 2005. "Panic Anxiety, Under the Weather?" *International Journal of Biometeorology* 49: 238-243.
- Chang, K. G., W. C. Sullivan, Y. H. Lin et al. 2016. "The Effect of Biodiversity on Green Space Users' Wellbeing—An empirical investigation using physiological evidence." *Sustainability* 8(10): 1049.
- Chen, R., C. Sun, J. J. Chen et al. 2021. "A Large-Scale Survey on Trauma, Burnout, and Posttraumatic Growth Among Nurses During the COVID-19 Pandemic." *International Journal of Mental Health Nursing* 30(1): 102-116.
- Cheng, Y., J. Zhang, W. Wei et al. 2021. "Effects of Urban Parks on Residents' Expressed Happiness Before and During the COVID-19 Pandemic." *Landscape and Urban Planning*. doi.org/10.1016/j.landurbplan.2021.104118.
- Children's Commissioner. 2020. *Children in the Time of Covid*. <https://assets.childrenscommissioner.gov.uk/wpuploads/2020/09/cco-childhood-in-the-time-of-covid.pdf>.
- Crabtree, A. 2012. "A Legitimate Freedom Approach to Sustainability: Sen, Scanlon and the inadequacy of the human development index." *The International Journal of Social Quality* 2.1: 24-40.
- Crabtree, A. 2013. "Sustainable Development: Does the capability approach have anything to offer? Outlining a legitimate freedom approach." *Journal of Human Development and Capabilities* 14(1): 40-57.
- Crabtree, A., ed. 2020. *Sustainability, Capabilities and Human Security*. Springer Nature.
- Dallimer, M., K. N. Irvine, A. M. Skinner et al. 2012. "Biodiversity and the Feel-Good Factor: Understanding associations between self-reported human well-being and species richness." *BioScience* 62(1): 47-55.
- Daly, M., and E. Robinson. 2021. "Longitudinal Changes in Psychological Distress in the UK from 2019 to September 2020 During the COVID-19 Pandemic: Evidence from a large nationally representative study." <https://doi.org/10.31234/osf.io/mjg72>.

- Dawes, J., T. May, A. McKinlay et al. 2021. "Impact of the COVID-19 Pandemic on the Mental Health and Wellbeing of Parents with Young Children: A qualitative interview study." *BMC psychology* 9(1): 1-13.
- De Vries, S., and R. Snep. 2019. "Biodiversity in the Context of 'Biodiversity–Mental Health' Research." In *Biodiversity and Health in the Face of Climate Change*, pp. 159-173. Springer, Cham.
- Deng, L., H. Luo, J. Ma et al. 2020. "Effects of Integration Between Visual Stimuli and Auditory Stimuli on Restorative Potential and Aesthetic Preference in Urban Green Spaces." *Urban Forestry & Urban Greening* 53: 126702.
- Dewa, L. H., C. Crandell, E. Choong et al. 2021. "CopeY: A mixed-methods coproduced study on the mental health status and coping strategies of young people during COVID-19 UK lockdown." *Journal of Adolescent Health* 68(4): 666-675.
- Díaz, S., U. Pascual, M. Stenseke et al. 2018. "Assessing Nature's Contributions to People." *Science* 359(6373): 270-272.
- Dickerson, J., B. Kelly, B. Lockyer et al. 2020a. "When Will This End? Will It End? The Impact of the March-June 2020 UK COVID-19 Lockdown Response on Mental Health: A longitudinal survey of mothers in the Born in Bradford study." *medRxiv*.
- Dickerson, J., B. Kelly, B. Lockyer et al. 2020b. "Experiences of Lockdown During the COVID-19 Pandemic: Descriptive findings from a survey of families in the Born in Bradford study." *Wellcome Open Research* 5.
- Ellis, E. C., N. Gauthier, K. K. Goldewijk et al. 2021. "People Have Shaped Most of Terrestrial Nature for at Least 12,000 Years." *Proceedings of the National Academy of Sciences* 118(17).
- Fielding, S. 2022. "Canada Lets Doctors Prescribe Trips to National Parks." <https://www.verywellmind.com/canada-lets-doctors-prescribe-trips-to-national-parks-5218922>.
- Fineberg, N. A., M. van Ameringen, L. Drummond et al. 2020. "How to Manage Obsessive-Compulsive Disorder (OCD) Under COVID-19: A clinician's guide from the International College of Obsessive Compulsive Spectrum Disorders (ICOCs) and the Obsessive-Compulsive and Related Disorders Research Network (OCRN) of the European College of Neuropsychopharmacology." *Comprehensive Psychiatry* 100: 152174.
- Forst, R. 2011. *The Right to Justification: Elements of a constructivist theory of justice*. Vol. 46. Columbia University Press.
- Fuller, R. A. K. N. Irvine, P. Devine et al. 2015. "Mental Health Benefits of Long-Term Exposure to Residential Green and Blue Spaces: A systematic review." *International Journal of Environmental Research and Public Health* 12(4): 4354-4379.
- Gasper, D., and G. Oscar. 2014. "Evolution of Thinking and Research on Human Security and Personal Security 1994-2013." <https://repub.eur.nl/pub/76016/>.
- Gilleen, J., A. Santaolalla, L. Valdearenas et al. 2021. "Impact of the COVID-19 Pandemic on the Mental Health and Well-Being of UK Healthcare Workers." *BJPsych open* 7(3).
- Gomez, O. 2020. *Protecting Our Human World Order: A human security compass for a new sustainability decade*. New York: Human Development Report Office. <http://hdr.undp.org/en/content/protecting-our-human-world-order-human-security-compass-new-sustainability-decade>.
- Gorczynski, P., and F. Fasoli. 2020. "LGBTQ+ Focused Mental Health Research Strategy in Response to COVID-19." *The Lancet Psychiatry* 7(8): e56.
- Gough, I. 2014. "Lists and Thresholds: Comparing the Doyal-Gough theory of human need with Nussbaum's capabilities approach." *Capabilities, Gender, Equality*: 357-82.
- Government of the United Kingdom. 2021. *COVID-19: Mental Health and Wellbeing Surveillance Report*. <https://www.gov.uk/government/publications/covid-19-mental-health-and-wellbeing-surveillance-spotlights/covid-19-mental-health-and-wellbeing-surveillance-report-spotlight-age-groups>.
- Green, P. 2020. "Risks to Children and Young People During Covid-19 Pandemic.." *Bmj* 369.
- Greene, T., J. Harju-Seppänen, M. Adeniji et al. 2021. "Predictors and Rates of PTSD, Depression and Anxiety in UK Frontline Health and Social Care Workers During COVID-19." *European Journal of Psychotraumatology* 12(1): 1882781.
- Gross, E., N. Jayasinghe, A. Brooks et al. 2021. *A Future for All: The need for human-wildlife coexistence*. Gland, Switzerland: World Wildlife Fund.

- The Guardian*. 2021a. "Death Caused by Alcohol at Highest Level Since 2008 in Scotland." 17 August. <https://www.theguardian.com/society/2021/aug/17/deaths-caused-by-alcohol-at-highest-level-since-2008-in-scotland>.
- The Guardian*. 2021b. "Lake District in Peril Due to Climate Emergency and Influx of Pandemic Walkers." 18 August. <https://www.theguardian.com/uk-news/2021/aug/18/lake-district-climate-emergency-pandemic-walkers>.
- Gunnarsson, B., I. Knez, M. Hedblom et al. 2020. "Stay-At-Home Orders Due to the COVID-19 Pandemic Are Associated with Elevated Depression and Anxiety in Younger, But Not Older Adults: Results from a nationwide community sample of adults from Germany." *Psychological Medicine*: 1-2.
- Ha, J., and H. J. Kim. 2021. "The Restorative Effects of Campus Landscape Biodiversity: Assessing visual and auditory perceptions among university students." *Urban Forestry & Urban Greening* 64: 127259.
- Hancock, M. 2021. "Preparing for Future Pandemics." <https://www.gov.uk/government/speeches/preparing-for-future-pandemics>.
- Hanzl, M. 2020. "Urban Forms and Green Infrastructure: The implications for public health during the COVID-19 Pandemic." *Cities & Health*. doi: 10.1080/23748834.2020.1791441.
- Hayes, N. 2021. *The Book of Trespass: Crossing the lines that divide us*. London: Bloomsbury Publishing.
- Hewitt, K. 2012. "Culture, Hazard and Disaster." In *The Routledge Handbook of Hazards and Disaster Risk Reduction*. London: Routledge.
- Holt, L., and L. Murray. 2021. "Children and COVID-19 in the UK." *Children's Geographies*: 1-8.
- Howard, S. 2020. "COVID-19: Health needs of sex workers are being sidelined, warn agencies." *British Medical Journal* 369: m1867.
- IPBES (International Panel on Biodiversity and Ecosystem Services). 2020a. "COVID-19 Stimulus Measures Must Save Lives, Protect Livelihoods, and Safeguard Nature to Reduce the Risk of Future Pandemics." Media release, 27 April. <https://www.ipbes.net/covid19stimulus>.
- . 2020b. *Workshop Report on Biodiversity and Pandemics of the Intergovernmental Platform on Biodiversity and Ecosystem Services*. Bonn: IPBES DOI:10.5281/zenodo.4147317.
- Jaspal, R., and B. Lopes. 2021. "Discrimination and Mental Health Outcomes in British Black and South Asian People During the COVID-19 Outbreak in the UK." *Mental Health, Religion & Culture* 24(1): 80-96.
- Jassi, A., K. Shahriyarmolki, T. Taylor et al. 2020. "OCD and COVID-19: A new frontier." *The Cognitive Behaviour Therapist* 13: E27. doi:10.1017/S1754470X20000318.
- Jia, R., K. Ayling, T. Chalder et al. 2020. "Mental Health in the UK During the COVID-19 Pandemic: Early observations." *MedRxiv*: 2020-05.
- Kaplan, S. 1995. "The Restorative Benefits of Nature: Toward an integrative framework." *Journal of Environmental Psychology* 15(3): 169-182.
- Kaplan, R., and S. Kaplan. 1989. *The Experience of Nature: A psychological perspective*. Cambridge University Press.
- Kelly, J., and T. Morgan. 2020. "Coronavirus: Domestic abuse calls up 25 percent since lockdown, charity says." BBC News. <https://www.bbc.com/news/uk-52157620>.
- Kooth. 2020. *How COVID Is Affecting the Mental Health of Children and Young People*. London: Kooth.
- Kwong, A. S., R. M. Pearson, M. J. Adams et al. 2021. "Mental Health Before and During the COVID-19 Pandemic in Two Longitudinal UK Population Cohorts." *The British Journal of Psychiatry* 218(6): 334-343.
- Leach, M., H. MacGregor, I. Scoones et al. 2021. "Post-Pandemic Transformations: How and why COVID-19 requires us to rethink development." *World Development* 138: 105233.
- Lenton, T. 2016. *Earth System Science: A very short introduction*. Vol. 464. Oxford University Press.
- Lob, E., P. Frank, A. Steptoe et al. 2020. "Levels of Severity of Depressive Symptoms Among At-Risk Groups in the UK During the COVID-19 Pandemic." *JAMA Network Open* 3(10): e2026064-e2026064.
- MacFarlane, S. N., and Y. F. Khong. 2006. *Human Security and the UN: A critical history*. Indiana University Press.
- Mansfield, K. E., R. Mathur, J. Tazare et al. 2021. "Indirect Acute Effects of the COVID-19 Pandemic on Physical and Mental Health in the UK: A population-based study." *The Lancet Digital Health* 3(4): e217-e230.
- Mariki, S. B., and M. L. Sengelela. 2019. "Coexisting with Wildlife: Its effects on pupils and children in a Maasai community, Tanzania." *Journal of Social and Political Sciences* 2(1): 142-159.
- Marmot, M. 2020. "Health Equity in England: The Marmot review 10 years on." *BMJ* 368.

- Marselle, M. R., J. Stadler, H. Korn et al., eds. 2019. *Biodiversity and Health in the Face of Climate Change*. Cham, Switzerland: Springer Nature.
- McCunn, L. J. 2020. "The Importance of Nature to City Living During the COVID-19 Pandemic: Considerations and goals from environmental psychology." *Cities & Health*. DOI: 10.1080/23748834.2020.1795385.
- McGowan, V. J., H. J. Lowther and C. Meads. 2021. "Life Under COVID-19 for LGBT+ People in the UK: Systematic review of UK research on the impact of COVID-19 on sexual and gender minority populations." *BMJ Open* 11(7): e050092.
- Mensah, C. A., L. Andres, U. Perera et al. 2016. "Enhancing Quality of Life Through the Lens of Green Spaces: A systematic review approach." *International Journal of Wellbeing* 6(1).
- Murphy, J., E. Spikol, O. McBride et al. 2020. "The Psychological Wellbeing of Frontline Workers in the United Kingdom During the Covid-19 Pandemic: First and second wave findings from the COVID-19 psychological research." Consortium (C19PRC) study.
- NatCan. 2022. "Society Watch: They think it's all over: The social legacy of the COVID-19 pandemic." <https://natcen.ac.uk/publications/society-watch-2022-they-think-its-all-over-social-legacy-covid-19-pandemic>.
- Natural England. 2018. "Opening Access to the Countryside." <https://www.gov.uk/government/news/opening-access-to-the-countryside>.
- . 2021. "The People and Nature Survey for England: Year 2 annual report—data and publications (April 2021–March 2022) (Official Statistics) main findings." <https://www.gov.uk/government/statistics/the-people-and-nature-survey-for-england-year-2-annual-report-data-and-publications-april-2021-march-2022-official-statistics-main-findings/the-people-and-nature-survey-for-england-year-2-annual-report-data-and-publications-april-2021-march-2022-official-statistics-main-findings>.
- Newlove-Delgado, T., S. McManus, K. Sadler et al. 2021. "Child Mental Health in England Before and During the COVID-19 Lockdown." *The Lancet Psychiatry* 8(5): 353-354.
- Norris, F. H., M. J. Friedman and P. J. Watson. 2002a. "60,000 Disaster Victims Speak: Part II. Summary and implications of the disaster mental health research." *Psychiatry: Interpersonal and biological processes* 65(3): 240-260.
- Norris, F. H., M. J. Friedman, P. J. Watson et al. 2002b. "60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001." *Psychiatry*, 65(3), 207-239.
- Nussbaum, M.C., 2007. *Frontiers of Justice*. Cambridge, Massachusetts: Harvard University Press.
- O'Connor, R. C., K. Wetherall, S. Cleare et al. 2021. "Mental Health and Well-being During the COVID-19 Pandemic: Longitudinal analyses of adults in the UK COVID-19 Mental Health & Wellbeing study." *The British Journal of Psychiatry* 218(6): 326-333.
- Office for National Statistics. 2020. "One in Eight British Households Has No Garden." <https://www.ons.gov.uk/economy/environmentalaccounts/articles/oneineightbritishhouseholdshasnogarden/2020-05-14>.
- OHCHR (Office of the High Commissioner on Human Rights). 2021. *Healthy Biosphere*. Report of the Special Rapporteur on Human Rights and the Environment. https://www.ohchr.org/Documents/Issues/Environment/SREnvironment/Healthy_Biosphere_A75161.pdf.
- Pappa, S., J. Barnett, I. Berges et al. 2021. "Tired, Worried and Burned Out, But Still Resilient: A cross-sectional study of mental health workers in the UK during the COVID-19 pandemic." *International Journal of Environmental Research and Public Health* 18(9): 4457.
- Pessoa, L. 2008. "On the Relationship Between Emotion and Cognition." *Nature Reviews Neuroscience* 9(2): 148-158.
- Proto, E., and C. Quintana-Domeque. 2021. "COVID-19 and Mental Health Deterioration by Ethnicity and Gender in the UK." *PloS one* 16(1): e0244419.
- Ratcliffe, E., B. Gatersleben and P. T. Sowden. 2016. "Associations with Bird Sounds: How do they relate to perceived restorative potential?" *Journal of Environmental Psychology* 47: 136–144. doi: 10.1016/j.jenvp.2016.05.009.
- Richardson, M., K. McEwan, F. Maratos et al. 2016. "Joy and Calm: How an evolutionary functional model of affect regulation informs positive emotions in nature." *Evolutionary Psychological Science* 2: 308-320.
- Richardson, E. A., N. V. San Juan, D. Aceituno et al. 2021. "Mental Health and Well-Being of Healthcare Workers During the COVID-19 Pandemic in the UK: Contrasting guidelines with experiences in practice." *BJPsych Open* 7(1).

- Rubin, O. 2009. "The Merits of Democracy in Famine Protection—Fact or Fallacy?" *The European Journal of Development Research* 21(5): 699-717.
- Rusi, J., and B. Lopes. 2021. "Discrimination and Mental Health Outcomes in British Black and South Asian People During the COVID-19 Outbreak in the UK." *Mental Health, Religion & Culture* 24(1): 80-96.
- Sagie, H., A. Morris, Y. Rofè et al. 2013. "Cross-cultural Perceptions of Ecosystem Services: A social inquiry on both sides of the Israeli–Jordanian border of the Southern Arava Valley Desert." *Journal of Arid Environments* 97: 38-48.
- Scanlon, T. 2000. *What We Owe to Each Other*. Belknap Press.
- Sen, A. K. 1999. *Development as Freedom*. Oxford: Oxford University Press.
- . 2009. *The Idea of Justice*. Cambridge, Massachusetts: Harvard University Press.
- Steffen, W., K. Richardson, J. Rockström et al. 2015. "Planetary Boundaries: Guiding human development on a changing planet." *Science* 347(6223).
- Steptoe, A., and G. Di Gessa. 2021. "Mental Health and Social Interactions of Older People with Physical Disabilities in England During the COVID-19 Pandemic: A longitudinal cohort study." *The Lancet Public Health* 6(6): e365-e373.
- Stewart, F. 2019. "The Human Development Approach: An overview." *Oxford Development Studies* 47.2: 135-153.
- UCL. 2020. *COVID Social Study*. 24 November. <https://www.covidsocialstudy.org/results>.
- Ulrich, R. S.. 1984. "View Through a Window May Influence Recovery from Surgery." *Science* 224 (4647): 420-421.
- Ulrich, R. S., R. F. Simons, B. D. Losito et al. 1991. "Stress Recovery During Exposure to Natural and Urban Environments." *Journal of Environmental Psychology* 11(3): 201-230.
- UNDP (United Nations Development Programme). 2014. *Human Development Report 2014: Sustaining Human Progress: Reducing vulnerabilities and building resilience*. New York: UNDP.
- . 2020. *Human Development Report 2020: The Next Frontier: Human Development and the Anthropocene*. New York: UNDP. <http://hdr.undp.org/en/2020-report>.
- UNEP (United Nations Environment Programme). 2021. *Becoming #generationrestoration: Ecosystem restoration for people, nature and climate*. <https://wedocs.unep.org/bitstream/handle/20.500.11822/36251/ERPNC.pdf>.
- Usher, K., J. Durkin and N. Bhullar. 2020. "The COVID-19 Pandemic and Mental Health Impacts." *International Journal of Mental Health Nursing* 29(3): 315.
- van Kleef, G. A., A. Cheshin, A. H. Fischer et al. 2016. "Editorial: The Social Nature of Emotions." *Frontiers in Psychology* 7: 896. doi: 10.3389/fpsyg.2016.00896.
- Venkatapuram, S. 2020. "Human Capabilities and Pandemics." *Journal of Human Development and Capabilities* 21(3): 280-286.
- Venter, Z. S., D. N. Barton, V. Gundersen et al. 2021. "Back to Nature: Norwegians sustain increased recreational use of urban green space months after the COVID-19 outbreak." *Landscape and Urban Planning* 214: 104175.
- White, M. P., I. Alcock, J. Grellier et al. 2019. "Spending at Least 120 Minutes a Week in Nature Is Associated with Good Health and Wellbeing." *Scientific Reports* 9(1): 1-11.
- Wickham, S., L. Bentley, T. Rose et al. 2020. "Effects on Mental Health of a UK Welfare Reform, Universal Credit: A longitudinal controlled study." *The Lancet Public Health* 5(3): e157-e164.
- Willcox, A. C., S. L. Harper, V. L Edge et al. 2013. "The Land Enriches the Soul: On climatic and environmental change, affect, and emotional health and well-being in Rigolet, Nunatsiavut, Canada." *Emotion, Space and Society* 6: 14-24.
- Wilson, E. O. 1986. *Biophilia*. Reprint edition. Cambridge, Massachusetts: Harvard University.
- Winthorst, W. H., A. M. Roest, E. H. Bos et al. 2017. "Seasonal Affective Disorder and Non-Seasonal Affective Disorders: Results from the NESDA study." *BJPsych open* 3(4): 196-203.
- Wood, G. 2003. "Staying Secure, Staying Poor: The "Faustian bargain". *World Development* 31(3): 455-471.
- World Bank. 2021. *The Economic Case for Nature*. Washington, DC: World Bank.
- WHO (World Health Organization). 2021. *Green and Blue Spaces and Mental Health: New evidence and perspectives for action*. Copenhagen.
- Xue, B., and A. McMunn. 2021. "Gender Differences in Unpaid Care Work and Psychological Distress in the UK COVID-19 Lockdown." *PloS one* 16(3): e0247959.

YoungMinds. 2021. "Corona Virus Impact on Young People with Mental Health Needs." <https://www.youngminds.org.uk/about-us/reports-and-impact/coronavirus-impact-on-young-people-with-mental-health-needs/>.

Zhang, Y., and J. Kang. 2017. "Effects of Soundscape on the Environmental Restoration in Urban Natural Environments." *Noise & Health* 19(87): 65.

Zhou, M., E. Hertog, K. Kolpashnikova et al. 2020. "Gender Inequalities: Changes in income, time use and well-being before and during the UK COVID-19 lockdown". <https://files.osf.io/v1/resources/u8ytc/providers/osfstorage/5ed64215c75686044d2d5b69?action=download&direct&version=8>.

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