



# Home and nearby nature: Uncovering relational flows between domestic and natural spaces in three countries during COVID-19

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## ABSTRACT

This paper addresses the role of living spaces, neighborhood environments, and access to nearby nature in shaping individual experiences of health and well-being during the first wave of the COVID-19 pandemic. Key data is drawn from the GreenCOVID study across Spain, England and Ireland. The survey gathered contextual information about home environments, neighborhood spaces, and access to nature elements, and standardized measures of health and wellbeing between April and July 2020 ( $n = 3,127$ ). The paper used qualitative data from the survey to document flows between home and nearby nature. These were framed as barriers/mediators with specific focus on differing interpretations of home as both trap and refuge, with additional dimensions of loss, disruption and interruption shaping the broad responses to the pandemic. By contrast nearby nature was an enabler/moderator of health and wellbeing, offering healthy flows between home and nature as well as respite and additional health-enabling factors. Differences were identified between the three countries but important commonalities emerged too, recognising the role nature plays as an asset both within and immediately beyond the home. The use of flow as metaphor also recognises the importance of embodiment and the elastic nature of connections between home and nearby nature for wellbeing. More broadly, flow provides a valuable way to trace affective relational geographers to develop a wider understanding of assemblages of health during pandemics.

## Introduction

### COVID-19 and its spatial effects

During the ongoing COVID-19 pandemic, vast research efforts have explored treatment, interventions, and vaccinations as well as identifiable impacts on human society, health, and wellbeing (Meyerowitz-Katz et al., 2021; Singh et al., 2021). For medical/health geographers, spatial epidemiology, disease diffusion and global impacts on health care systems, have been central concerns within a spatially framed public health (Andrews et al., 2021). In addition, globalized relational geographies and hyper-flows between spaces have prolonged different waves of the virus (Andrews et al., 2021). Beyond vaccines, other public health interventions, including substantive societal lockdowns, have been designed to disrupt the flow of the disease, yet inevitably disrupt flows in everyday life to reduce the spread of disease (Brunsdon et al., 2020;

Onyeaka et al., 2021). Depending on the severity of restrictive measures, many people have been confined to home, triggering different responses, ranging from feelings of entrapment to security. More positively, the impact of COVID-19 has been mitigated in part by people's ability to access health-enabling natural spaces and places in their immediate surroundings (Foley and Garrido-Cumbrera, 2021; Pearson et al., 2021). In this paper, we consider qualitative evidence from the GreenCOVID International Survey on how COVID-19 shaped health and wellbeing in Spain, England and Ireland between April and July 2020 (Garrido-Cumbrera et al., 2021). Specific mental health indicators were explored within the GreenCOVID survey alongside individual characteristics, lifestyle and physical activity, household factors, local environments including access to nearby green/blue space, and wider links to COVID-19 regulation (Garrido-Cumbrera et al., 2021). Furthermore, the GreenCOVID survey included two open-ended questions on how people felt during lockdowns and how nature operated as a moderator of

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that experience. Comments from over 3000 respondents identified the pandemic's variable spatial impacts, both structural and place-based, but also how these were assembled and affectively experienced. The multi-country perspective considered assemblages of place, lifestyles, and health care governance and explored how these shaped citizen health and wellbeing in diverse cultural settings during a pandemic.

#### *Enabling healthy flows between home and neighbourhood green spaces*

Extensive research on the relationships between improved wellbeing and contact with nature has focused primarily on green and blue spaces (Groenewegen et al., 2012; Hartig et al., 2014; Shanahan et al., 2016; Triguero-Mas et al., 2015; Astell Burt and Feng, 2019). This research, broadly speaking, has focused on different types of spaces and users (Gascon et al., 2015); access and proximity (Wheeler et al., 2012) and measurable health benefits from regular exposure, either as visual or physical immersion (Garrido-Cumbrera et al., 2021). The nature of flows and experiences of different types of green and blue space and their measurable value to promote mental health and wellbeing in particular, is documented in research on nature-contact, attention-restoration and stress-reduction (Hartig et al., 2003; Ives et al., 2017; Keniger et al., 2013). Although much research focuses on public green/blue spaces like parks and beaches, the value of private green space is also recognised, usually at a smaller scale, and often including domestic spaces such as gardens and balconies (Theodorou et al., 2021). Across green/blue space research, the importance of both physical and affective dimensions is emphasised, as well as a recognition that different assemblages of green/blue space operate in different and often complex and unpredictable ways to promote and sustain health and wellbeing (Duff, 2014; Lachowycz and Jones, 2013). Likewise, recent research on programmatic elements, such as designed interventions and social prescription, also recognise the complexity of the relationships between green/blue space and health and wellbeing and its potential for public and mental health interventions (Masterton et al., 2019; Britton et al., 2018).

Wider research on COVID-19 has identified measurable spatial inequalities between and within countries, regions, cities and even neighbourhoods (Andrews et al., 2021; Rose-Redwood et al., 2020; Shostak et al., 2021). In particular, the ability of the COVID-19 pandemic to devastate poorer and marginalized communities exacerbates existing global geographies of spatial injustice (Bambra et al., 2020). This applies also to measurable differences in geographical access to, and availability of, green space as a health asset, especially within deprived communities (Pearson et al., 2021). Such studies have effectively identified the who, what and where of those patterns, linked to wider pandemic governance and ongoing structural issues around health, housing and care (Spotswood et al., 2021). We use the material from the GreenCOVID survey to identify more closely how people described their experiences, and explore why micro-geographies of home, neighbourhood and nature shape health and wellbeing, particularly during a time where public health regulation often specifically reduced access to nature (Tomasso et al., 2021).

In being locked into the home, a range of social and health impacts such as isolation, loneliness, disruptions to working lives, anger, or preoccupation about the future have begun to seriously affect mental health (Ahrens et al., 2021; Brodeur et al., 2021). A growing evidence base on the effects of lockdowns and confinement to home spaces exposes cracks in domestic wellbeing; evident in increased levels of marital breakdown and domestic abuse (Darmody et al., 2020; Smith and Easterlow, 2005; George and Wesley, 2021). The wider sociodemographic effects of the COVID-19 pandemic on mental health have been considerable, with young people and women experiencing the largest declines (Banks and Xu, 2020), as well as Italian evidence that levels of anxiety, depressive symptoms and stress became more severe over the duration of pandemic lockdowns (Fiorillo et al., 2020). Such negative health outcomes are in part linked to being stuck in place; in contrast to more normal flows across people's lives, between home, work, and

wider society (Reuschke and Felstead, 2020). We argue that flow acts as a crucial enabler of health and wellbeing in everyday life. This applies not just to physical activity (within green/blue spaces and home), but also to wider relations: topologies (networks) and topographies (places and spaces) that allow for built and natural environments to work together to sustain health and wellbeing (Kilanowski, 2017). Given physical and mental constraints brought about by COVID-19, those relations have been blocked, interrupted and diverted, but in looking at how citizens re-assemble both home and nearby nature as health-enabling resources to tackle those constraints, new appreciation of those spaces has emerged (Garside et al., 2020). We also explore in this paper the consequences on well-being and mental health of *not* being able to have contact with nature, which complements more common approaches that explore how nature can help to better cope with pandemic confinements. This shapes our own thinking and survey design, within which our open-ended questions were especially important to our understanding of specific impacts and effects.

Across the interface of place, space and public health, COVID-19 offers an active route to explore assemblages of health and wellbeing (Duff, 2014). The reality of dealing with COVID-19 challenges was faced with old ideas around fixed services, users, and communities, operating in bounded static ways; and is replaced by a recognition of pandemic lives shaped by differential mobility and fluidity of human movement in time and space, with complex emplaced relationships that produce heterogenous and constantly changing health outcomes (Cummins et al., 2007). In addition, there is a strong affective dimension to assemblages that consider, "a distinctive meshwork of practices, events, affects and relations" (Duff and Hill, 2022, 1). We use a definition of affect that, "is concerned with how emotions, sensations, atmospheres and feelings arise out of relational encounters between objects, spaces and people" (Spinney, 2015, 235). The impact of the pandemic on emotional health and wellbeing is evident in fear, concerns and restrictions on daily life that seemingly emerge from nowhere but through daily uncertainty, risks and confinement have become a deeply affecting experience for all. Assemblage thinking considers in part, a detailed mapping out of everyday place-based flows and networkings (social, cultural, familial and health) delineating how health becomes enabled in and between place(s) (Andrews and Duff, 2019). For COVID-19 those assemblages are evident not just in the surveillance/tracking of the disease, but also as interruptions that have, temporarily, suspended society within time and space. These interruptions and blockages to flows have emerged in very relational ways across multiple scales of operation, also shaping affective connections between regulation and experience (Duff, 2012; Foley et al., 2019). At a macro-geographical scale, the role of governments (national and global) and health agencies in shaping the flow of individual and communal health behaviors, as well as critical mass-media reporting, all shape an affective societal response shaped by cultural values. At micro- and meso-geographical scales, flows within the home and flows between it and nearby nature exemplify the interface of lived experience and public health regulation. While the interruptions are evident, there are also other allowances and affordances as enabling elements within the flows; examples include access to views and other multi-sensorial appreciations of nearby nature, as well as green space within the home, that help withstand the negative effects of the pandemic (Bell and Foley, 2021; Brace et al., 2020; Theodorou et al., 2021).

In our analysis we identify flows as affective components within assemblages of home/nearby nature that simultaneously trace the health/wellbeing impacts and effects of COVID-19. These are fluid across different countries, with higher vulnerabilities associated with ageing, ethnicities, and deprivation (Burnett et al., 2021). While in other areas of population health, COVID-19 has come as a shock in existing relations, it has put renewed emphasis on the potential of nature and natural spaces to act as important health-enabling assets in times of crisis (Duff, 2012). While there are aspects of Foucauldian governmentality in public health directives to self-manage behaviors, the

increased uses of green, blue, and other spaces have become important autonomous health-care management tools within the pandemic response (Corley et al., 2021; Spotswood et al., 2021; Guzman et al., 2022). In addition, lack of access to indoor facilities has been identified as affecting physical and mental health, across societies, and enhanced the importance of nearby outdoor natural spaces. In identifying home and nearby nature as spaces of respite and refuge during the pandemic, we feel there is a longer-term value in this way of tracking different elements that both interrupt and lubricate healthy flows as they emerge in different cultures and geographical settings (Sport England, 2020). Following Lachowycz and Jones (2013) we consider flows in terms of mediators and moderators: the former explaining processes through which two variables (home/nature and health/wellbeing) are related, the latter accounting for the strength and direction of that relationship. In providing insights into different mediating and moderating factors that shape these flows, our survey recognizes Duff's contention that 'becoming well' is an 'always-unfinished event of recovery [linking] human and nonhuman spaces, bodies, objects, and forces in the joint expression of an enhanced capacity to affect (and be affected by) other bodies and spaces' (Duff, 2016: 58). This can clearly also include people becoming less-well, as a specific impact of both the virus and the lockdown and our survey results do identify those negative aspects of the assemblage. But an emphasis on processes of recovery feels especially important during COVID-19; dimensions of respite and repair are evident in the tracing of flows and the blockages and bypasses that sustain those flows; deformations and reformations of assemblage that include the notion of not being well along with the notion of being well during the pandemic. Our work tracks how people use nature as a means of coping with deeper blockages of the social, material and affective components of assemblage made real under COVID-19 (Duff and Hill, 2014). It identifies flows as negotiations in and through space from home to nearby nature, documenting these effects and experiences as expressed across three countries. While some flows are common, others are shaped by their geographical and cultural settings. The GreenCOVID survey identifies specific enablers and barriers that help us better understand how home and nearby nature shapes the maintenance of health and well-being during a global pandemic.

## Methods

### *The GreenCOVID international survey*

The GreenCOVID<sup>1</sup> survey was initially developed within Spain by the Health & Territory Research (HTR) group of the University of Seville and subsequently rolled out in England and Ireland through the University of Winchester and Maynooth University, respectively. Having an international dimension to the survey was crucial in identifying spatial variations in the pandemic's effects across jurisdictions, yet also considered local demographics, cultures, and public health responses in providing explanation and potential causality. The online survey was conducted across Spain between 8th and 27th April 2020. England and Ireland joined and disseminated translated versions of the survey; in England from June 3rd to July 27th, and in Ireland between June 3rd and July 31st. The final cleaned sample was 3127 people: 2464 (79%) from Spain, 420 (13%) from England and 243 (8%) from Ireland. In the total sample, the average age was 39.8 years; youngest in Spain (38.1 years), followed by Ireland (42.7 years) and England (47.3 years). The survey was randomly disseminated online with a preponderance of female respondents, 73%. From a housing/home perspective, in Spain 72.1% of the total sample lived in flats/apartments, while in England and Ireland, it was more common to live in a terraced, town or detached house (both over 85%). Household size was smaller in Spain (105.2 m<sup>2</sup>), compared

to England and Ireland (198.7m<sup>2</sup> and 245.9m<sup>2</sup>, respectively). Fuller survey details, including its geographical spread, are available in a parallel paper that also identifies broadly positive associations between access to nearby greenspaces and improved health and wellbeing outcomes (Garrido-Cumbrera et al., 2021). In addition, preliminary findings on specific household factors affecting health and wellbeing identified both negative (smells, moisture, smoke, poor lighting and insulation, safety issues and neighbours' noise) and positive (having a terrace, yard, garden, rooftop or balcony or a view of nature) elements that inform the qualitative results presented below (Guzman et al., 2020). Further quantitative results on views, household characteristics, mental health and wellbeing are in development, but this paper focuses specifically on the qualitative research based on responses to two open-ended that provide deeper experiential insights into flows between homes and nearby nature. Open-ended responses provide qualitative information that includes the perceptions and opinions of survey participants. Therefore, the aim of the present study is to analyse how the COVID-19 pandemic and related lockdowns disrupted, reconfigured, and strengthened the relationship with the micro-spaces of the household and nearby nature, focusing on commonalities and variations between and within the three countries.

We conducted an analysis of data collected through the following open-ended questions: (1) "Describe how the COVID-19 crisis is affecting you?" and (2) "Describe the reasons why it is important for you to enjoy free spaces in contact with nature". From the 3127 individuals who completed the survey, 2596 provided a response to the first open-ended question, and 2593 to the second open-ended question (84% of Spanish, 76% of English and 88% of Irish respondents). Length of responses varied from a few words to substantial responses containing up to 267 words, with an average of 26 words. We used NVivo 12 Software to organize the data from the 3 countries and data from Spain was translated into English language by a co-author with previous professional experience in translation. Analysis was carried out following the template analysis procedural steps outlined by King (2017). Template analysis falls under the umbrella of 'codebook' thematic analysis and offers a systematic and flexible approach to qualitative data analysis (Braun and Clark, 2021). This approach was selected since it facilitates the participation of multiple researchers in the analysis and allows to explore both a priori and emerging themes (King, 2017). First, RF and VG became familiar with participant's responses by reading and re-reading all accounts and noting initial ideas. Secondly, authors independently carried out preliminary coding in the English and Irish responses. Authors then met to discuss their interpretations of this data, organized codes into meaningful clusters, and paid close attention to specific mentions of flows and mobilities, including terms that hinted at interruptions to that flow (trapped, stuck, blocked) and the lubricating effects of home and natural spaces (freedom, space, breathing). Then, an overall coding structure was developed and further refined through several iterations. Finally, the coding structure was applied to the remaining data and compelling extracts were chosen for the report, each recorded against the respondents home country (ESP: Spain; ENG: England; IRL: Ireland). Methodological rigour was enhanced through negative case analysis, clear audit trails and peer debriefing (Tracy, 2010).

While the open nature of Question 1 brought in a lot of wider dimensions of the pandemic, it also aimed to uncover particular impacts/stressors on individual health and wellbeing (Soga et al., 2021). Since Question 2 was directed more specifically at the enabling potential of green space, several responses detail the reasons why it was important for participants to enjoy free spaces in contact with nature. From analysis reiteration of both questions, we identified two broad categories we termed, stressors/mediators and enablers/moderators. In the case of stressors/mediators, key themes identified included loss/disruption as well as specific negative health and wellbeing effects (physical, mental, social, and emotional). The role of nature as an enabler, especially as a setting for respite, refuge, recovery, and health maintenance, was a key

<sup>1</sup> Full title: *Effects of The COVID-19 Pandemic Lockdown on Exposure and Contact with Nature in Three European Countries.*

moderating theme shaping positive health and well-being.

## Empirical findings

### *Introduction: flows of health and wellbeing: reductive and enabling dimensions*

In its open-ended questions, the GreenCOVID survey sought to identify specific place-based factors that in part linked to governance and societal response. Stringent public health measures in Spain, prohibiting people from going outside buildings for walks or visiting green/natural areas, prevented direct exposure and interaction with the outside world, had evident consequences on lifestyles, physical and mental health. Less stringent measures still constrained people to staying near the home, e.g., in Ireland in 2 km/5 km catchments, which provided some flow space (see also Garrido-Cumbrera et al., 2021 for a fuller description of restrictions). The qualitative responses provided scope for understanding and evaluating the impacts of lockdown on how domestic and natural space related to one another, how a reshaping of this emerged during the pandemic and how an assemblage approach helps in understanding those impacts as deformations and reformations of societal health and wellbeing.

### *Flow as mediator: deformations, interruptions and blockages*

From the initial question on how the pandemic was affecting respondents, we identified both negative and positive perceived outcomes. Participants' responses emphasised interrupted and blocked flows emergent in both physical activities and mental states across the three countries, but also recognisable in affective deformations and truncations of the mesh of assemblages of home and nature (Duff and Hill, 2022). In structural terms, this deformation of previous certainties, both spatial and emotional, emphasises how important these are to reliability of a lived assemblage. Even accounting for everyday variations de-structuring had a significant affective impact which is broadly listed below as affective absence, disruption/interruption and feelings of entrapment. Affective absences included a series of losses to everyday wellbeing including loss of friends/relatives due to COVID; loss of life milestones; loss of travel and leisure opportunities; loss of 'personal' space; loss of normality, plans and routine.

In several survey responses, the affective absence was literal; acknowledging that the flow of life comes to a stop but doing so unexpectedly feels more impactful. In rituals around loss and grief, especially in Ireland where funerals are essential relational events, the blocking off of flows of shared care and grieving seem especially cruel, with respondents noting: "Upset for the people that have died and contracted it and also for people who can't attend funerals and give people the send off they deserve." (IRL) That sense of interrupted/truncated flow linked to affective absence applied equally to more positive life-course milestones such as missed births, graduations, weddings or intergenerational celebrations. Flows of leisure and travel were also disrupted, while the changing pandemic governance added additional uncertainty into wider life planning:

"I am stressed by the number of deaths and thinking of people who die alone or who lose a family member and cannot say goodbye. Also, the possibility of getting sick because I am a population at risk for asthma and I don't know who could take care of my children. It makes me sad to think of children who live in small flats and do not have a space to play and do not have the sun or the air. It also distresses me to think of people who experience toxic or abusive family situations during confinement". (ESP)

Across responses, loss and disruption emerged as significant negative mediators, alongside other barriers for health and wellbeing. Accounts from all three jurisdictions identified a multiplier effect of pressures associated with lockdown, such as enhanced requirements to care for

self and others; reduced incomes and concerns over poverty; worry about those with ongoing conditions; reduced access to medical care, welfare and other supports; etc. Several narratives referred to more than one disruption and highlighted their additive potential. For example, a respondent wrote they were:

"Suffering underlying stress due to underlying health issues, uncertainty regarding education of my children in new academic year (one starting university), economic fall out and restrictions on travel particularly not being able to get to the sea or mountains". (IRL)

This response speaks to a set of specific deformations that generated negative affects due to uncertainty and the actual loss or threat of loss of personal health, work, education and social mobility. While the sense of loss commonly incorporated feelings of grief, additional affective responses ranged from anger to hopelessness. Such responses spoke to a wider affective feeling of entrapment within a more normalised world of everyday flows, interactions with mental health and wellbeing, and a range of negative emotions including isolation, anxiety and depression:

"I'm feeling constantly exhausted, overworked, hemmed in, stressed, restless and sad at being prevented from doing the things I love. I miss being able to go into wild spots whenever I want to. I feel like I'm not measuring up to the pressures of work and life". (ENG)

Two core affects, fear and uncertainty, flagged interrupted flows and shifts in everyday plans and emphasised how important control, autonomy and certainty were to mental health management and wider feelings of stress and powerlessness. In some instances, the disruptions pertained short term plans that provide a structure to life, such as the following: "Its selfish I know but we have missed holidays (2) and whilst we have the money etc. returned, its such events that I really look forward to and help keep me happy" (ENG). Respondents also referred to longer term effects, such as lost or truncated educational and career opportunities:

"Make me feel like my family is going to be financially ruined. That I will not be able to continue to have scholarships to study, and that therefore I have no future here when I finish my studies. They also make me fear for my health and affect my desire to lead a normal life when this ends, if it is true that there will be relapses". (ESP)

Accounts also collectively referred to other blockages in flow in relation to health and wellbeing. These included reduced access to medical care; postponement of surgery or ancillary services; and reduced welfare and assemblages of affective support. For some people living with pre-conditions not related to COVID-19, these disruptions often led to exacerbation of disease and increased stressors:

"I find it difficult to make the most of the time to exercise as I have some temporary muscular-skeletal issues which were due to be treated but now are not being which is also affecting my mental health. As a single widowed parent, I feel lonely and under a lot of pressure to look after my child and also fearful of dying and leaving my child alone". (IRL)

In terms of physical wellbeing, reduced physical activity, lost fitness, weight gain and unhealthy eating and alcohol consumption were identified across all three countries. For instance, a respondent wrote: "I have gained weight because I'm eating more (due to being bored on my own while working in my kitchen, while at the same time not walking to work every day)" (ESP). Across all three countries, other identifiable effects included a general feeling of life being on hold and reduced social contact linked to restrictions of movement even if digital connectivity partially sustained everyday societal assemblages. We also identified profound disruptions between flows from home and work that reshaped everyday livelihoods in the spectre of unemployment, uncertain incomes and enhanced caring impacts:

“I am unemployed and worried about my finances as the sector I work in is likely to be in considerable difficulty. I have a young child and am worried about his social development as he cannot see friends or family. I am in recovery from an eating disorder but finding it difficult not to relapse”. (ENG)

Others had similar issues with deformed assemblages in family lives, including the transformation of home into both workplace and school, while they also recognised some positive buffering elements that balanced those effects:

“Working from home and juggling children’s education is stressful. It’s quite isolating not being able to see friends or family in the way we did before. The children are really missing their friends. And working from home has led me to eating less healthily and gaining weight. But I do have flexibility over the hours I work and have enjoyed spending more time with the kids. It’s been a real insight helping them with their learning. And we’ve spent much more time outdoors than we otherwise would have (although this is partly due to the fantastic spring weather we’ve had”. (ENG)

Flows, especially from the home to outside, also represented a form of everyday regulation of life. From this perspective, negative factors were identified, especially in Spain, that affected flow, such as an undesirable sharing of both living and public spaces, linked to feelings of being crowded out; exacerbated by loss of routine. The lack of flow across both a working and personal life was highlighted, both in terms of holding assemblages of wellbeing in place, but also how the loss of flow to nature had a negative emotional effect, particularly when dwelling characteristics were not appropriate:

“I miss hiking and going out of the country house with my friends. The rest of the confinement I’m getting on well. The worst thing is that my house is very small, and I don’t have good conditions to telecommute 10 h a day”. (ESP)

Here reduced flow to commonly used safety valves represent a core relational blockage. During home confinement in Spain one of the few activities allowed was dog walking, which undoubtedly contributed to the sudden boom in the dog buying market. One respondent wistfully noted the lack of one, as an excuse to go outside; though equally the value of a pet as a more-than-human support was also identified (Brace et al., 2020; Bowen et al., 2020):

“I do not have a patio or terrace; the communal roof is prohibited. I do not have a dog to walk, and I only go out to the supermarket from time to time. Now I appreciate more the sun, the air, the peace of nature, the beach, the park. It gives well-being and tranquillity”. (ESP)

Echoing earlier work on composition and context (Smith and East-erlow, 2005), the idea of home-as-trap, emerged strongly from the responses, especially from Spain, where more citizens lived in apartment blocks, compounded by stronger prohibitions around leaving home. This sense of feeling trapped and removed from flow, was experienced in multi-scalar forms, an especially important factor in terms of mental health:

“Since the confinement was decreed, I have stayed in my apartment with my family. I have not even gone out to shop, the last time I went out was on March 13 .... I feel that I am fading, I am even losing interest in living, I need air. I would give anything to be able to go out on my bike, feel the sun, the wind, the untaintedness outside these 4 walls. Here I feel that I am going to go crazy, lacking the air I need to breathe”. (ESP)

For many being trapped at home emphasized a range of negative built environment elements (i.e., noise, smells, reduced services), but also meant not being able to escape from these annoyances; entrapment at home also generated some ambivalent experiences of social

connection. For some respondents it was the isolation and loneliness that represented the challenge to which outdoor and nature provided a respite opportunity:

“I’m going crazy, I need to get out. I need to see people in person, talk to people live. I need to walk and go to the park as I have never needed before. I wish we could at least go to the park. It would take away a lot of anxiety”. (ESP)

However, for others it was the constant company of family or other co-habitants which reminded people that sometimes having a space of one’s own may be necessary:

“Being stuck at home with my family for long periods of time is very stressful. I need to get out and work off energy or start to feel depressed. It’s also nice to be able to sit somewhere away from my home and have some time alone”. (IRL)

Place bound experiences were linked to wider local entrapments beyond the home, including confinement and constrained flows within nearby neighborhood: 2 km in Ireland and more variably (depending on region) in England. Although feelings of entrapment were not shared by all, with particular exceptions observed among essential workers whose own mobility was compromised by higher risks of viral exposure. Participants’ accounts suggested an overall shrunken and weakened network of flows and a reduced socialisation in place, something commonly expressed across all three jurisdictions. Overall, responses exemplify a societal sense of blocked flows in everyday lives and livelihoods but move beyond that to suggest that deeper affective interruptions are at the heart of COVID-19’s impacts. The accounts emphasise deep disturbances of habitual practices and societal flows, a reminder of the importance of structure and certainty in people’s lives and felt in a specific absence of certainty.

#### *Flow as moderator: reforming assemblages of home and nearby nature*

Question 2 was phrased in a way that enabled the identification of reformations of the assemblage, evident in the capacity of green/blue spaces to enable flow to promote positive physical and mental wellbeing. While Question 1 on the pandemic’s impacts did show some positive responses, Question 2 identified more substantially the enabling value of nearby nature as a moderator of flow within and beyond the home (Aresta and Salingaros, 2021). Negative comments, primarily around access and overcrowding, were rare, compared with almost universal recognition of nature’s positive capacity to provide solace and space outside the home (Burnett et al., 2021). We identified key themes from the analysis including affective flows between home and nature, nature as a provider of respite, and other place-based factors including physical activity and socialisation.

Responses that framed nature as a contingent and necessary space in the management of wellbeing in the early stages of the pandemic, identified enabling resources across old and new affective flows between home and nature. From a mental health perspective, exposure to nature provided a welcome contrast to feelings of entrapment with a “change of scenery rather than just the four walls of your house” (IRL), and was also identified as an essential (re)balancing flow of breath, air and affective calm, that provided sensory and cognitive stimulation: “To have a sensation of scale, so that the eyes can rest looking at infinity and to feel that the clean air caresses your face and fills your lungs” (ESP). With a renewed appreciation of nearby nature, people realized how important it was particularly in contrast to notions of home-as-trap, from which it provided an escape set alongside a more affective framing of home-as-refuge. Where people could get outside, it provided a sense of freedom that really mattered when other everyday flows felt out of control:

“I think it is very important to be able to spend time outdoors. We are lucky to have a garden. It has been quite crazy with the children at home the days that it has rained, I imagine myself without a garden

every day and I would go crazy. Having some time in the sun and the outdoors makes going through the confinement much better". (ESP)

In this and other responses, participants recognised having a garden as an affective asset, which opened up light and space in a domestic setting as well as beyond it. Similarly, other neighborhood and local characteristics were recognized as desirable if they enabled outdoor and nature engagement. For instance, a respondent wrote: "Fortunately, I live in an isolated building in the countryside, and I am still in contact with nature. I think that is my salvation from this strange situation that we are living" (ESP). This contrasted with the closing down of contact with nature and green space within some urban settings: "I have not left my house in 1 month and have not been near a tree. This is what happens in cities where there is only cement, sometimes we need to be in touch with living beings" (ESP). Closely aligned with the idea of refuge, the identification of nature as respite space was common across all three countries. In terms of flow, natural spaces were identified as important for recovery and getting away, even temporarily, from pressures of both home and pandemic. Respite was associated with being free, mobile and unstuck, each a release of flow potential, but also in mental health terms an asset that supports wellbeing management:

"Where we live, there is a small network of communal pathways .... It is not... frequently populated, so we often took walks for about 20 min or so and sat on some of the benches for another 30. Being able to walk and be outside is really important for me to not get too restless or frustrated with living in a tiny space. Sunlight, breeze, and bird-song are of course all really nice and calming, so it's nice to be able to go outside and relax a little bit. It also helps my adhd, both to keep me from getting under stimulated, and to help me physically signal to my brain that I'm switching activities". (ENG)

Mental wellbeing benefits also emerged in the identification of natural spaces as being specifically calming and stress-reducing. This finding resonates with psychological evidence on attention-restoration, especially to the more-than-human (Tester-Jones et al., 2020), and identify nature as providing a space to block-out or release negative emotions. In contrast, participants with limited opportunities to engage with nature or for whom valuable encounters were curtailed commented on some negative effects on their health and wellbeing:

"Being able to walk is very important to me, I have noticed cramps in my legs for days after taking my daily walks. Nature helps me not have anxiety and calms me down. The lack of natural light is making me more nervous". (ESP)

Nature's affective qualities also had a temporal component, with many responses identifying nature as a space in which time and thoughts slowed down. Spending time in nature with others was part of that slowing down while outdoor physical activity provided mental relaxation; a form of mindful grounding-in-mobility also identified in recent swimming research (Britton and Foley, 2021). Time spent outdoors was contrasted with time spent indoors, and "noticing nature" was a recurrent comment, showcasing enhanced appreciations of more-than-human flows as an additional rebalancing component of respite. Across all three jurisdictions such feelings are present in quotes that reflect the value of nature in providing both an affective boost and an emotional safety-valve:

"They provide a space for the mind to relax from COVID, the green, bird noises and fresh ocean water wash over the overwhelmed feelings. Makes me feel re-charged on energy and ready to move forwards (or give it a go again)." (IRL)

"It is important to be able to enjoy the outdoors, the sun, the wind, see wide and open spaces, listen to the birds, have a drink outside to clear your mind and get rid of the feeling of being enclosed. Also, something unforeseen always happens". (ESP)

"Being in the garden with the trees and plants really cheers me up. Also walking in the woods and parks. When I cycled to the sea it gave me such a boost to be near it. It has made a tremendous difference to be able to see the sea and walk in the parks". (ENG)

As apparent in these accounts, the combination of a physical activity response that incorporates a strong affective element with re-appreciation of nature, indicates how the assemblage reforms itself in both everyday use and imagination to rebuild health and wellbeing. The value of nature as a setting for physical activity and mobility (Sugiyama et al., 2013), as a contrast to the more stuck and trapping aspects of the lockdown speak directly to how flows into nature offer affective possibilities and promote healthy behaviors:

"Getting out for walks and exercise had helped me remain calm and release stress. I've been getting out for as much exercise as possible each day between running, cycling and walking at least twice a day. The lockdown has made me appreciate nature again." (IRL)

The affective effects of space emerged as important, linked to a wider freedom, but also to an allowance of flows, both within and beyond the home. This links especially to recent research on walkability, good access to nearby green space and there is much that connects these comments to that research strand (Sugiyama et al., 2013; Giles-Corti et al., 2014). Moreover, the sense of green/blue spaces as essential permeated social interactions through opportunities for safe physically distanced encounters and a break from close contacts at home:

"I don't think I'd have survived without – when it gets really tough, I can go out into the garden or nearby riverbank and tune into wildlife and forget the loneliness for a while. I space where being alone is fulfilling and rewarding not just depressing". (ENG)

This account reflects important 'choice' dimensions of control, and the possibility provided by outdoor environments to "share with others or be alone as desired" (ESP). As an established health and wellbeing outcome in the literature, socialisation was another important affective activity emergent from flows between domestic and natural space. Chief amongst these was the simple value of human contact, as meeting or seeing other bodies beyond the home generated positive emotions:

"It's so overwhelmingly important that it's hard to put into words. It is freedom, an escape from the house, calming, mindful, joyful. And now, it is somewhere where it is easy to meet family and friends for a socially distanced walk or visit". (IRL)

While this was possible within built environments, it was more accessible in nature. Spanish residents found this difficult to do in apartment blocks, so such choices were weaker than in the Atlantic Isles, though some quietly transgressed:

"I have always felt calm, and relaxation being surrounded by nature, especially in landscapes with water, such as the beach or large rivers. In situations of prolonged anxiety or stress, I go to these places to relax. These days I have been experiencing a growing anxiety about the confinement, week after week. Going out to throw the garbage overwhelms me more, because I constantly think that I am going to return to the confinement. Yesterday, I decided to skip the confinement in a not very dangerous way, in my opinion, to go to an old family house where no one lives, which has a small outdoor yard, to sit and look at the sky and get some sun. I was there for almost two hours, and my anxiety has dropped a lot, I plan to do it again". (ESP)

The identification of both safe social space and escape from confinement were evident here in a reworked assemblage which identified a strong affect in both the public health legislation but also how individuals individually negotiated with it. In some accounts, and mirroring home environments, the behavior of others caused stress and exemplified the always contingent nature of assumed therapeutic encounter (Conradson, 2005). Contested users and uses are ongoing

features of shared green spaces, even more evident, given the heightened emotions around pandemic lockdowns (Plane and Klodawsky, 2013; Masterton et al., 2021):

“Fresh air is essential for body and mind. Being surrounded by green is calming and grounding. But it can be difficult to access even local green spaces because of the speed at which drivers move their vehicles in close proximity to people walking and cycling. A short walk or cycle becomes stressful and upsetting because of drivers’ disregard for the vulnerable people around them ... as drivers routinely exceed speed limits and careen through red lights”. (IRL)

An enhanced affective awareness of the relationships between the natural and built environment recognised more-than-human aspects of the home/nature assemblage and their two-way flow into one another:

“In general, we live very badly in cities: very high air pollution and noise, due to traffic, which is becoming more and more unbearable for me. Seeing green and hearing birds is essential to be able to experience the variety of life forms (and in that sense, it is also an aesthetic experience of the first order). Also, verifying that we are not the only existing creatures, that there is life beyond us, and that it is complex and different helps us to relativize that feeling of omnipotence that has collapsed with the pandemic”. (ESP)

This and other similar responses acknowledged affective human frailty and hint at opportunities to embed the renewed environmental awareness into developing and adapting our future individual/shared living spaces to support health and wellbeing.

## Summary

### *Affective flows during COVID-19*

From qualitative evidence across the GreenCOVID survey, similar affective flows were traceable between home and nearby nature in Spain, England, and Ireland, despite different disease trajectories, lockdown regulations and social/cultural assemblages. Focusing on both negative and positive dimensions of that flow and associated effects/affects on people’s health and wellbeing, we identified renewed appreciation for natural spaces inside and outside the home and their value for affective interactions. Qualitative responses helped identify mediators and moderators of health and wellbeing linked to exposure (or lack thereof) during the COVID-19 pandemic (Meyerowitz-Katz et al., 2021). There were variations based on location and other spatial factors such as weather, but always a flowing connection between people and different scales of space and encounter with nearby nature (Bell et al., 2019). We offer evidence on differential impacts of pandemic lockdowns on entrapped domestic spaces, and how these might be mitigated and moderated by relations with nearby nature (Lachowycz and Jones, 2013). Home acts as both a space that limits flow, but also a relational node in connecting that flow, and we identify from the survey different culture-specific responses from three countries; partially shaped by fuller access to and views of gardens as private green space assets, in England/Ireland compared to higher levels of apartment-dwelling in Spain (Garrido-Cumbrera et al., 2021). It also identified the relative importance of housing type and tenure and the availability of natural spaces in immediate built or nearby natural environments (Corley et al., 2021; Guzman et al., 2022). Wider research on COVID-19 identifies inequalities in access to natural environments, but also within different forms of housing; a wider attention to inequalities in greenspace access may provide useful evidence for wider urban social planning (Olsen and Mitchell, 2020). Lessons for what happens when flows are reopened and how health and wellbeing might be shaped differently have significant structural dimensions, equally deepening understandings of flows within and through the home; what does and does not work for wellbeing in communal and shared housing settings, included the under-rated importance of ‘internal green’ (Theodorou et al., 2021). There is

an additional irony in the term, home-as-trap, given widespread crises in all three countries around access to housing and growing homelessness, but better attention to assemblages of housing and greenspace form, and their relation to each other as both mediator and moderator highlight opportunities for deeper research.

Describing these flows across the assemblage included some ‘Zen’ affective moments; but also, how the experiential flows of everyday life acted as lubricants that fostered movement along active lived networks; flows that matter in the functional and material dimensions in assemblages of health and wellbeing (Duff, 2012). During COVID-19, interruptions to that flow were physical and mental: the virus acting as both somatic (respiratory lubrication and work/home (im)mobility) and psychological (truncated social networks, enhanced fear and anxiety, blurred spaces) interrupter. Green space assemblages emerged as important enablers of healthy flow at a population level: for most respondents being outdoors in good weather and in sociable environments (even if not touching) re-emphasised the value of socialisation and the ‘everyday wash’ of others. Those flows echo discussions on braided health (Lovell et al., 2021), within which the complex channeled flows between and within home and nature operate at different rates and speeds, yet also consider cultural variations and inclusion (Macfarlane and Macfarlane, 2019). Interruptions and blockages were shaped by local cultural factors such as tougher lockdowns in Spain, where in addition, apartment living was more common. Flows in nature were enabled in different ways: for some nature acted as release valve or natural oxygen tank of light, air and autonomous rather than assisted breath; markers of a natural flow into which people wanted to imbricate themselves. The wider value of respite, of taking/having a break from the incessant pressures of the pandemic, operated across different scales and flows of relational selves. If one insidious aspect of COVID-19 is the virus’s ability to exploit cracks in immune systems, it also uncovers and widens cracks in everyday lives and emotions and disrupt the linkages and connections that hold wider assemblages of health and wellbeing together. Nature is articulated in our study as an important salve and sealant for those cracks, a healing flow enabled by views, exposure, affective availability, and contingent use. Natural spaces act as valuable open settings for potential encounter within otherwise locked down domestic spaces. They also show the value of incidental encounters; encounters that exemplify important social, emotional, even romantic relations interrupted by the pandemic.

A telling aspect of the qualitative responses is their very embodied affective nature, against which wider flows of senses and feelings were interrupted and blocked off by COVID-19. Physical activity and everyday mobilities are essential components of a shared wellbeing practice and the closing off of that embodied expression created wider vulnerabilities and weaknesses in relations (Stockwell et al., 2021). Natural spaces reduce stress, provide respite from pressures at home (with additional workplace identities), help bodies recover and become still. Yet this is a relational stillness with everyone finding their own flow and still points in imbrications between home and nearby nature. That relationship between flow and non-flow is important in terms of physical activity being constrained by being in the home but enabled outside.

In discussing flows between assemblages of home/inside and nature/outside, COVID-19 identified an elasticity in relations that was social, ecological, and temporal (Ward, 2020). The different benefits identified for nature, usually related back to home, identify elasticity as a topological idea, with every connection - spatial and social - stretched in both positive and negative ways during the pandemic. While there is a durability to that relation, it becomes reconfigured under pressure or even snaps. We argue this reflects how flows are reconfigured in spaces; yet wider research suggests nature as a setting for hard resets or rewiring of brain circuits creating new neural as well as spatial pathways (Kühn et al., 2021). Material aspects of relational flow identified green space as an important natural matter across three countries: acting as balancing element against the material-built environment and differential flows between them (Andrews and Duff, 2019). One prominent finding across

responses is a deeper recognition of what really matters: connection, small joys, proximal resources, an enhanced attunement to the natural world. The different cultural relations between the countries matter in terms of lifestyles outside and the obvious differences in seasonal flow between Spain, where being outside is a way of life; and the more enclosed spaces of home shaped by Atlantic climates (Bell et al., 2019).

There are limitations to our analysis findings and generalizability. The online nature of the data limited opportunities to contribute in the study to individuals with access to the internet and digital technologies, and the samples from the three countries are not representative of their general population. Additionally, the nature of open-ended survey questions did not allow researchers to prompt participants or clarify information from short responses. However, it is a strength that the survey questions were purposefully developed to explore the effects lockdown by COVID-19 on exposure and contact with the environment. In addition, the online survey allowed for timely data collection that provided insights into how natural and built environments influenced health and well-being outcomes during the early stages of the pandemic.

## Conclusions

Across the survey responses, there are hints of empathic learning and wider buy-in to a shared public health response; shared care and hopeful adaptations evident in the home and in nature. These provide interesting lessons for geographical gerontology as the GreenCOVID survey identifies the importance of domestic green space, mobility affordances, light and space, common across all three countries. As flows have been reduced and people confined to homes and neighbourhoods, it provides an emergency proxy for the experience of ageing-in-place in terms of reduced bodily capacities and activity spaces. It may make wider society more mindful of the interruptions and capacity reductions experienced by older people or people with disabilities. The findings also help promote a wider recognition of nature as an asset for all across the life course; one that has multiplier effects in terms of care and maintenance of lived flows and that applies equally to children and family geographies, both also deeply affected by COVID-19. Finally, our wider study identifies that alongside an ongoing engagement with nature to manage health and wellbeing, an enhanced appreciation of nature helps promote pro-environmental responses and wider place-care (Garrido-Cumbrera et al., 2021). We consider that, for all the country-specific interruptions and blockages identified by our respondents, the ongoing flows between and within home and nearby nature have been affectively deepened during the COVID-19 pandemic in broadly similar forms in Spain, England and Ireland. Those flows reflect a gratifying public response in our study countries and beyond, recognising the best means to enable health and wellbeing are philosophies built on shared care and mutuality, expressible in both spatial and societal form.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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In recognition of research taking place during and arguably trading on a time of acute public health distress, we dedicate this article to all people who have been affected by COVID-19; who have lost loved ones and family; or who have worked bravely to mitigate its effects. We also recognise that suffering unwittingly supports research; but hopefully that research may also help alleviate that suffering. VG contribution was supported by the Health Research Board (HRB) Grant Under SPHeRE-2019-1. GreenCOVID survey supported by the University of Seville and the Spanish Geographical Association (AGE).

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.wss.2022.100093.

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