

Catherine McDonald 0:07

Hello, and welcome to insights a podcast from [Understanding Society](#). The study that captures life in the UK in the 21st century, Understanding Society is a longitudinal survey. Every year we ask each member of thousands of the same households across the UK about different aspects of their lives. In each episode of this series, we're exploring how our data has been used in a key area. We'll look at what we found, what it tells us and what we can learn from it. I'm your host, Katherine McDonald, and in this episode, we're looking at how the physical environment in which you live can significantly affect your well being and in turn your life. Here to discuss this are [Dr. Sarah Knight](#) from the University of York, [Professor Brendan Burchell](#) from Magdalene College, Cambridge, and [Graham Duxbury](#), Chief Executive of [Groundwork](#), a charity that seeks to empower communities through environmental action. So Sarah, policymakers are increasingly using measures of subjective wellbeing to inform public policy. Can you start us off by telling us a bit about how they define and measure wellbeing?

Sarah Knight 1:15

Sure. So wellbeing is probably used interchangeably with health, and they influence each other, and they're on the same spectrum. But wellbeing is described as a multi-dimensional person specific, culture specific, kind of dynamic phenomenon. So probably, traditionally, it's measured objectively. So things like gross domestic product, income, so forth, are used as proxies for wellbeing. And more recently, there's the inclusion of physiological metrics such as cognitive functioning, stress response, things like that. So they're objective measures. And then on the other side are subjective measures of wellbeing. And that's a much more recent phenomenon. So it's shortened down. It's a person's cognitive and affective evaluation of their own life. And, again, there's lots of definitions of subjective wellbeing tend to be three components of it, eudaemonic, hedonic and life satisfaction. So eudaemonic is this kind of reference to all your activities worthwhile. Hedonic relates more to happiness and emotion, and it can be positive or negative, and life satisfaction, again, a kind of evaluation of satisfaction with your daily activities. And these are really picked up probably in the UK, in that 2010, David Cameron brought in the measures of national wellbeing to try and understand the different drivers of wellbeing across society. And then this is picked up, it's probably now used across all government departments in some form or another as a kind of measure of progress. And countries have taken this forward. So for example, New Zealand have a wellbeing economy. So wellbeing is really embedded as a measure of progress. Some people will say it's a better measure of progress than things like GDP. Wellbeing is embedded in things like the levelling up agenda, and international programmes, such as the sustainable development goals. And a good example of measurement of it used by our government is used by the Office of National Statistics Wellbeing -4 (ONS4) and they measure life satisfaction, how worthwhile you rate your daily activities, and your level of happiness and your level of anxiety.

Catherine McDonald 3:21

So it's great to know that all of that is being monitored and evaluated. In your study, "Can clean air make you happy?" You found the increases in air pollution from nitrogen dioxide, which is a gas mostly produced in diesel fumes had a negative impact on people's life satisfaction, and that the size of that impact was comparable to many, as you call them big hitting life events. Can you tell us more about that?

Sarah Knight 3:48

So yeah, me and some colleagues at University of York, we used the harmonised dataset of British Household Panel Survey and the UK Households Longitudinal Study. So we took about 50,000 adults from England and had a look as they moved about space and time trying to control for other determinants of wellbeing. Do we see a relationship between life satisfaction and how people experience air pollution? So our main results showed that an increase in 10 micrograms of nitrogen dioxide reduces your life satisfaction by 0.3 on a Likert scale of 7. That sounds meaningless, I think. So we wanted to find a better way to communicate how meaningful that is for people and we wanted to compare that to how that affects size is comparable to other determinants of wellbeing. So things like employment status and relationship status. If people were raised to the legal limit of nitrogen dioxide, which is 40 micrograms per metres cubed, the loss of life satisfaction was comparable to what we found within the dataset to things like marital separation, and about 50% on going from employee to unemployed. So, two really big determinants of life satisfaction, your happiness and the effect of this kind of level of exposure to nitrogen dioxide was much more substantive than we were expecting.

Catherine McDonald 5:04

And obviously, that's the effects on life satisfaction and nitrogen dioxide can also cause physical health problems as well, can't it? Can you tell us a bit about what they are?

Sarah Knight 5:13

Sure. So nitrogen dioxide, there's lots of research that shows it as a really big contributor to respiratory tract problems. So it probably exacerbates existing health conditions and can also bring about new conditions. So asthma will be a big one. Short term exposure to this can irritate your lung lining, irritate asthma, coughing, etc. More chronic exposure has been linked to increases in cardiovascular and respiratory issues. And there's a huge contribution from nitrogen dioxide to early deaths.

Catherine McDonald 5:45

And one of the main arguments you made in your research really clearly was that exposure to nitrogen dioxide is something that we all face, to some extent, with you know, diesel run cars. So therefore, the benefits of reducing those emissions would be significant.

Sarah Knight 6:01

When we relate it to these other determinants of wellbeing you think, you know, not everybody is unemployed, not everybody is single, but everyone to an extent is exposed to air pollution, it has different causes, but it's experienced by everybody. So a reduction in air pollution is likely to affect everybody. But there are probably gradients to the size of the effect of the different people. So some people are more exposed than others. So there's likely to be greater benefits for different demographics, but on the whole is experienced by everybody. So a reduction will likely have really broad societal impact.

Catherine McDonald 6:36

And as with many things, the UK is not geographically equal when it comes to exposure to nitrogen dioxide, either, is it what did you find there?

Sarah Knight 6:45

Yeah, absolutely. It's really interesting, and it's possibly what most people would expect. So where there's transport, and where there's people, there's nitrogen dioxide, road, vehicles, industry, etc, are really big causes a really big outputs of nitrogen dioxide. So we have a look at the spatial distribution of NO₂ and looked at the highest and the lowest values across England. So the average value in the Southwest, so in Cornwall, Devon is about 3 micrograms per metres cubed. And this is a kind of a annual ambient mean level. And the value for London is just under 60. Now this was taken for 2014, we did this. So there's quite a significant gap there, if you think an increase in 10 micrograms, and that we found has a significant relationship with the life satisfaction, actually, that you can see, then that kind of sits within these values quite clearly. The legal limit set by the EU based on World Health Organisation guidelines is 40 micrograms per metres cubed. So you can see that, for example, in places like London, you get a regular exceedance of this value. And so there's two values, there's annual exceedance, and there's daily limit exceedances. And again, these are based all by the World Health Organization's guidelines for what it means for people and for society. In 2018, London exceeded this daily limit within the first five days of the year. And there are places also, and it's not just London, there's London, there's other big cities, places with airports and a port, big transport hubs, they also have these exceedances. And I do believe in 2018, the UK Government was taken to court over this.

Catherine McDonald 8:18

So what can we do to reduce the amount of exposure? Is it only about turning to cleaner vehicles? Or can the damage be offset by time spent in green spaces? For example?

Sarah Knight 8:29

Yeah, so there's probably two ways. There'll be things like reducing your car journeys will reduce air pollution. You know, there's also not the onus necessarily on the individual, there's things about kind of in transport industries and so forth that need addressing. But as you know, as we know, diesel cars are being slowly reduced in this country, and we do see a reduction in NO₂ over time, which is fab and is probably largely attributed to that policy change. For individuals, I'd say avoid hotspots. So obviously, central London at major commuting and transport times, you can simply think about your routes about how you're moving about places. So even if you're just one road off the main busy road, your exposure to air pollution is significantly lower. So find quieter routes, or quieter times, in pedestrianised and green places. And, of course, COVID was a huge natural experiment about this, we saw huge reductions in air pollution as a consequence of this. And there were really really clear benefits to health, to wellbeing, and to how people are enjoying their cities.

Catherine McDonald 9:32

So let's move on to talk about green spaces now, then. Another study you did also looked at the importance of the ecological quality of public open spaces for wellbeing, what did you compare there? And what did you end up finding?

Sarah Knight 9:47

So we looked at London for this study, and we wanted to look at the relationship between public green and blue spaces and wellbeing. For green anything vegetation on, for blue, anything with water on and do we see it different relationships when we look at places of higher ecological quality. So we looked at places called sinks, which is a London designation. And it refers to sites of importance for Nature Conservation. So places that have good habitat for wildlife, so high ecological quality spaces, are they better for people than just greenspaces in general is quality better than just provision. So we use really high resolution data from GiGL, the greenspace information for Greater London centre, they have really nice model data, which identifies all locations across London, which are deficient in access to nature. And we use that dataset with the BHPS with the British Household Panel Survey, to see as people move through time and space, is their changing wellbeing related to a change in proximity to high quality green space, we found that being deficient to access to nature is bad for life satisfaction. So it's not just provision that's important for satisfaction, that is the quality of the green space and the blue space.

Catherine McDonald 11:03

Understood. Okay, thank you for that. Brendan, I'd like to come to you now, in your research, you approached it slightly differently. And you asked whether public space has to be green, in order to improve wellbeing. So before we dive into that, were you working on the same definitions as Sarah, as you know, so as we move forward and talk about green, blue and hard surface? Can you just run through those definitions for us?

Brendan Burchell 11:27

Yes, we did look at particularly green spaces, parks, countryside, footpaths, those sorts of things. And as Sarah was describing, we found all sorts of benefits for people's wellbeing having access to those sorts of spaces. We didn't do the sort of fine grain differentiation between those spaces that Sarah did. And there's all sorts of reasons that people give as reasons to get into nature that Sarah was talking about, being able to take exercise, being able to meet other people in those places. And we replicated those findings. But what was more interesting about our research was we went to look at the other types of public spaces in London. And those are the hard spaces. These can be children's playgrounds, skate parks, marketplaces, civic areas, town square, type spaces. And there's less research on those, when you look at the outer areas of London, you get a lot more of the green space. And they tend to be the more affluent areas, these other hard surface spaces tend to occur closer to the centre of London, and often in the less affluent areas. So that's where we think wellbeing might be particularly important. And when we first looked at those hard spaces, we didn't find any effects on wellbeing. And there wasn't much research to go before it was very much an exploratory study. Interestingly, though, when we started to differentiate between them, we did notice it really mattered where those hard spaces were. And it mattered who the people using the were as well. But if they were in an area that was perceived to be safe, that sort of area, you'd be happy to walk around, say, in the evening or after dark, then there will clearly was a benefit we found to people having those spaces, those public spaces close to where they live. But if you lived in an area where you didn't feel safe, then those areas could become threatening to you, we hypothesised. And then we actually found the opposite, we found a could have a negative effect on people's wellbeing.

Catherine McDonald 13:22

Did you get a sense of why that is, and if so what we could do to make them beneficial, regardless of where they are?

Brendan Burchell 13:28

We weren't able to follow up our research and do what would have liked to do some more qualitative research, to really dig deeper into why people have these reactions to public spaces, these hard spaces, then they are different in a number of different ways, clearly to the green spaces that has been so much research on, they tend to be much smaller, for instance, and they tend to if anything, force, or encourage people to be closer to other people using that space. So if you're in a, say, a children's play area, or a small area where there's sports going on, then you're likely to more likely to have contact with other people, at least, you know, sense that you're in a group of other people. And that can be a very positive thing. If you resonate with those people, if you think you have things in common, you feel safe around those people. But of course, if you're feeling threatened by those people, you think that there's a threat to your safety, there might be sexual harassment going on, there might be people engaging unsocial behaviours, then that's when we're going to find that threats overcomes the benefits of those hard spaces. So it's really important, where you put those spaces, and also how you design those spaces to encourage the good things that we can get from those bases and discourage the ways in which they can actually have a negative impact on people's sense of them. The other important dimension to it is who's experiencing those spaces. Again, we just so lucky to have these really rich datasets about London and about you know, people's wellbeing through the Understanding Society dataset, so we could get a sense of how people related to their local community, which is so important, it comes up again and again, in studies of urban living studies, sociology and psychology. We understood the tenure, and we could differentiate people who own their homes who rented their homes or in social housing, renting social housing, and the people who were renting social housing, in particular, it magnified this effects. And we presume that people often in that sort of housing can be more vulnerable. So they can benefit more from interaction with other people, maybe helping them to overcome loneliness, which we know is such an important issue in the UK and in London. But if they're feeling threatened, again, they probably feel maybe more vulnerable to that threat than other people.

Catherine McDonald 14.24

When you put it all together all, your thoughts and findings together, what policy recommendations were you able to make as a result of your research?

Brendan Burchell 15:51

It's one of those bits of research, we think we've opened up a whole area that these things really matter. But how they matter and how they actually translate into the design of space, we couldn't come up and say, 'this is what you need to do', you need to consider like, giving people hard surface spaces near their homes isn't necessarily a good thing, it could be a negative thing, you need to look at the whole safety issue, how safe people feel in going around their local neighbourhood, and need to look at the vulnerability of the people using their spaces. So I think there's a lot to think about, we hope that there'll be a lot more research, we already have a really good understanding through Sarah's research and other research like it, of the possible benefits of greenspace, how that works. We know a lot less about hard space. We don't even know much about how much there is, for instance, in our

research, we didn't include pavements, and in some places, in London, pavements make up the vast majority of those hard spaces. And again, we know that in some areas, you get really positive life on pavements, in other case, places they are seen as as harsh threatening unpleasant environments. So we absolutely need to have a much deeper understanding of the way that this hard space is important in people's lives, particularly those people living in the less affluent areas or near the centres of big cities.

Catherine McDonald 15:57

Absolutely, as you say, you know, a complex set of elements to consider not just one quick, easy fix. Graham, I'd like to bring you in here. How would you react to the research findings that Brendan and Sarah have talked about?

Graham Duxbury 17:24

Well, I guess I'd say initially that I'm not surprised by the findings that are coming out for both of those pieces of work. But I'm really pleased that we're able to continue deepening our understanding of these issues. The link between environmental quality and wellbeing has been well established for many years, I think Public Health England, in 2020, we're talking about more than a billion pounds in health costs can be saved if everyone had good access to high quality green space. So there's the kind of physical benefits of that, the greener the neighbourhood, the lower obesity rates and reduced cardiovascular mortality. There's the mental health benefits of all of that. So green space, triggers positive emotions reduces anxiety improves life satisfaction, as we've heard, and there's even a study I know about where even having a view of trees outside your hospital window, helps you recover quicker from whatever procedure you've had. So all of this is well established. But it's excellent to be able to kind of, as I say, deepen that understanding. I'm particularly interested in Brendan's work around the hard spaces, because this isn't kind of fully studied or understood and I'm sure there's something here about the degree to which people feel able to connect and interact and feel part of the place in which they're in and having spaces to do that. Having spaces where you feel comfortable, where you feel safe, there's going to be a fundamental tool, that it's kind of the social infrastructure that we all need in order to feel good about ourselves and our place in the world. And then the other bit that I think is always an issue in these conversations is the social gradient and the inequality. So we know that exposure to environmental harms and access to environmental benefits is massively unequal in our societies. So if you were to map air pollution levels, and flood risk levels, and extreme heat levels, and access to green space levels, and overlay that on disadvantage, and deprivation indices, you'd find a pretty solid correlation. So yeah, it all kind of fits with the pattern that we've seen from previous research. It adds more detail, but it also fits with our kind of anecdotal evidence that we get from the work that we do on the ground in and with communities, engaging them in projects and activities to do with the design and development of spaces in their neighbourhood.

Catherine McDonald 19:33

Absolutely. And as you say, really important to have research like this to provide an evidence base on which hopefully decisions can be made and policy can be informed. Tell us what Groundwork aims to do and a bit about how it does that.

Graham Duxbury 19:47

So Groundwork has been around for 40 years. We're having a little anniversary moment this year. And we were set up very specifically at a specific point in time with a specific aim. It was a kind of time of crisis late 70s early 80s where there was a recognition that communities were being buffeted by forces seemingly beyond their control. So at the time, it was all about deindustrialization. It was about social tensions arising as a result of mass unemployment. And it was about the environmental degradation that went along with that post-industrial change, I guess. And the experiment that we were set up as we were set up as an experiment as Operation Groundwork was to put some professional skills at the disposal of local communities so that they could fashion practical solutions to some of those issues at a neighbourhood level. So that became you know, a lot about urban greening, it became about community organising, it became about the kind of confidence and skills and employability benefits that can result from that kind of work. And gradually, that went from a one off project on Merseyside to a national network and indeed, an international movement these days, and the same principles really are still in play the same focus on practical solutions, the same focus on helping communities make decisions, take control, get more involved in the way assets or management services are run in their local area, especially to do with the physical fabric of those local areas. And that's just playing out against the backdrop of different crises. So you know, the pandemic and the health inequality crisis that that demonstrated and highlighted and exacerbated straight into a cost of living crisis underpinning all of this climate and nature emergency. So what our projects, programmes and services are all about is trying to support the resilience of communities against that backdrop, and in that context, but also to foster community led action, and really practical solutions on some of those, you know, big environmental challenges. And that could be projects that would be very pertinent to today's discussion, such as planting green screens around school playgrounds, I think I saw a number of about 6.5k schools are in areas with dangerously high levels of air pollution. So simple measures about kind of greening the outside of our school playgrounds can make an appreciable difference. It might be about what we're doing climate proof landscapes that work with communities, local authorities, housing associations, to make sure local areas are more resilient to surface water runoff and extreme heat and so on. And quite often, we kind of gravitate towards particular places, particular community hubs that we might facilitate or manage where a lot of these activities can go on together, where a lot of volunteering activity can take place. And people feel a kind of sense of ownership of that place. And then from that place, we can ripple out services of activities, that across a wider neighbourhood.

Catherine McDonald 19:52

And when you look at the statistics that Groundwork cites to evidence why your work is so important, they are really startling. So just to quote a few 75% of people say they feel unable to influence decisions about what happens in their local area. Nearly half of young people say they feel they don't belong to their own neighbourhood. And 40% of young people admit to feeling overwhelmed by the climate crisis. They are staggering, aren't they those figures?

Graham Duxbury 23:01

They are, absolutely. Yeah, and it's a feature and it's a principle of our work really, that if you can focus on kind of practical, tangible solutions, they can become a springboard for deeper levels of engagement, greater levels of community led action and decision making.

And there is this kind of empowering effect. And that plays out across the spectrum. Obviously, you know, for some people who traditionally have been marginalised in some of these conversations that might just be about having a voice and feeling that you know, you are being listened to in the way that decisions are being made, and public spaces are being designed and developed. For others, it might be support we can provide to help people become a more recognised community leader, to take on that responsibility of driving forward action and activity. And there is a lot of focus at the moment on community power as a concept, and who has a how do we foster it? How do you devolve kind of power and responsibility to local residents, local communities so that they can work effectively alongside public bodies and civil society organisations. And I just think these issues that we're talking about of the quality of local environments, the degree to which our shared spaces are hard grey spaces, or high quality, green spaces, the role of the local environment, it can be really, really powerful in nurturing greater levels of community power, it's everybody's business, it's a shared concern, everybody benefits from their spaces and places outside their front door at the end of the street. It's a visible, very visible indicator of the way things change in a neighbourhood. It's either on the up or on the way down, you know, the classic broken window theory, if no one's looking after a public space, then that tends to kind of create a cycle of decline that needs to be arrested and needs to be remedied. And a lot of the projects that we get involved in and that we support in these spaces can genuinely be community led and owned. So there are simple tasks. There are lots of different tasks at lots of different levels of people have lots of different abilities. And if we're going to, you know, address some of those inequality issues and those access issues and those quality issues that Sarah was talking about. People need to feel that these spaces are relevant to them, they need to feel safe in them. And they need to see people using them that are like them so that they feel comfortable in these spaces. So there's a huge scope for using local environments as a way of kind of getting traction on bigger societal issues, that in and of itself, there's a massive job to be done to make sure that those public spaces those green spaces that are of high quality, are relevant, are accessible and are contributing to the kind of wider goals that we need to have around nature recovery and tackling climate change.

Catherine McDonald 25:37

And Brendan, Sarah, presumably, you would both totally echo what Graham has said there and how powerful the work of Groundwork and organisations like Groundwork is?

Brendan Burchell 25:47

Yes, that makes total sense to me. And I know from my own personal experience of living in cities, and living in the countryside, how much that sense of ownership and interaction with the local environment can bring your community together. But we do have to remember that with the public hard spaces, they seem to equally often doing damage to people as they are doing benefits to people. So understanding that difference. And if we can better understand it, then I think it can really take that sort of work that Graham and other organisations are doing further so we can maximise the benefits from that very valuable work.

Sarah Knight 26:24

Yeah, absolutely echo what Brendan said. And I think Groundwork does an excellent job in terms of connecting people with nature. I think there's kind of a real disconnect with nature

in our country. And you know, we are one of the most depleted in biodiversity countries in Europe. So involvement in things like green social prescribing projects, kind of nature being suggested to people, getting people to take ownership of the spaces around them, to connect them and to really leverage those benefits from being in spaces and also improving them for themselves and for the environment as well.

Catherine McDonald 27:00

So I mean, sort of last question to all of you. And Graham, I'd like to come to you first. If you could say three things to policymakers and planners who are looking at physical space and how it's used right now, what would you say?

Graham Duxbury 27:15

I'd start with health, we really need some leadership on this from the health sector from the health perspective. So we've got integrated care boards and integrated care systems, which might give us another lever into this conversation. Because we know the solution to long term NHS and care funding is better prevention. And we know that the way in which we design and manage open spaces and the environments on which we all depend is going to be a crucial part of that. So that'd be my first bit. The second one is let's make the most of the money funding opportunities that there currently are. So we are committed to spending lots of money on levelling up funds and pound funds. And mayors have got, you know, a devolved powers around transport and skills, etc. There's an awful lot that can be done around green infrastructure and open space and public space and pride of place that isn't necessarily been done. So we just done a bit of research that shows that less than 5% of the money spent or allocated through those funds at the moment, is going towards projects with a clear focus on the green infrastructure, for instance. And then the last one for me is to recognise and invest in proper community engagement and community development. So we've got to make all of this stuff: green infrastructure, hard open spaces, relevant. And we can use that as a springboard for greater levels of community led action, on a range of other issues. But community engagement doesn't just happen by itself. It's a skill set. It needs to be invested in it needs to be supported.

Catherine McDonald 28:38

And Brendan, what would your three things be?

Brendan Burchell 28:42

I can only come up with two things to add to Graham's great points. The first is how important it is to include wellbeing and health into the design of the places we live, in particular city cities. We're going to have to redesign cities, I think quite considerably in the near future, if we're going to meet our climate targets, to decarbonize the way we go about our daily lives. And so while we're doing that, we shouldn't lose sight of the other ways in which we can positively use those environments to tackle other social problems such as health, such as tackling loneliness. The other point I'd like to make is, I think this shows a really nice example of when we're joining up the people collecting and making data available. And we're really grateful to Understanding Society and really grateful to the way in which London's provided such good data to researchers, that feeds through to people like myself who can make sense of that data. And it's often these relationships I've seen, sometimes they're very clear, like the benefits of green spaces. Other times, they're quite

complex, and they need social scientists often to really be able to unpick that and then the way that can then feed through to policymakers and if we've got that sort of join up between the people providing data, people analysing data and policymakers, then it makes me feel very positive about the way we can go forward with society, and really do things to improve people's lives that way better experience their day to day environment.

Catherine McDonald 30:08

And Sarah, final word to you, then what would your three messages to policymakers and planners looking at physical space and how it should be used? What would yours be?

Sarah Knight 30:17

Hm! Great ones already from Brendan and Graham, and I'll add to this, I'll say, quality is important, not just provision. So I think it's really important to say that in a green, grey, blue, hard, whatever the space is, it has to be about quality beyond just provision because these places aren't homogenous. Secondly, and similarly, quality is subjective. It's a perceived aspects of space. And this varies across demographics, socio economic gradients, gender, age, all the intersections of these things. So I think we just need better understanding about what this means. And I think this is this kind of context specific stuff, you can put a place somewhere, but who lives there as well, who's around it, and who does it supply. And I think that context is really important. And it's probably related to my third point as well is about this really important need, to connect people with nature. And it's a priority for loads of different government departments and bodies connecting people with nature, harnessing nature connection to really leverage health and wellbeing benefits from green infrastructure from environmental interventions. It's a really cost effective way of achieving environment and health care benefits. So again, investing in friends of groups, for example, getting building green infrastructure that's close to people. So this feeds into kind of urban design, urban planning, and so forth. Because there's a biodiversity crisis. There's a climate crisis, and there's a health loneliness, wellbeing crisis. So investing in green infrastructure and blue infrastructure. And as we've heard grey infrastructure, it's a really, really important way to address these crises.

Catherine McDonald 31:55

My thanks to Sarah Knight, Brendan Burchell and Graham Duxbury, you can find out more about how the data from Understanding Society is changing practice and informing policy by visiting the = website understandingsociety.ac.uk. This was a [Research Podcasts](#) production. Thank you for listening and remember to subscribe wherever you receive your podcasts.