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The evidence of positive effects from nature includes studies on specific psychological conditions such as depression, anxiety and mood disorder. Access to nature has also been found to improve sleep and reduce stress, increase happiness and reduce negative emotions, promote positive social interactions and even help generate a sense of meaning to life. Being in green environments boosts various aspects of thinking, including attention, memory and creativity, in people both with and without depression. "The evidence is very solid," says psychologist Marc Berman at the University of Chicago.

Complications in comparing studies and saying exactly what's good for whom makes it hard to distil the effects into an individual prescription (see "How much nature do I need?"). In the UK's remote Shetland Islands, however, they are doing just that: since 2018, doctors there have been able to prescribe nature-based activities such as birdwatching and beach walks to treat mental health conditions and stress, as well as physical conditions such as heart disease and diabetes. They aren't alone, either: a review in 2019 identified 28 nature-based interventions used in various countries to improve health and well-being, from organised gardening programmes to forest bathing.

If we are to maximise the benefits of nature for the world's legion of nature-deprived city dwellers, we need to know exactly how they work. Here, too, there appears to be no simple answer.

Urban vegetation can benefit people's physical health by absorbing harmful airborne particulates and other pollutants produced by fossil fuel-powered transport and industry. It may improve mental health in this way as well. Evidence is emerging that exposure to these pollutants can damage the central nervous system and is linked with certain mental health conditions such as depression. Urban vegetation also helps mitigate noise pollution, which causes stress and sleep disturbance.

Paying attention

Another possibility is that the mental health effect is mediated via physical health: urban residents living near green spaces simply take more exercise, which in turn improves their mental health. But most research suggests otherwise. In many cultures, visiting green spaces is less associated with physical exercise than with sedentary social activities, such as picnicking. That could be a source of

nature's benefits in its own right: socialising can reduce loneliness, anxiety and depression. Certainly, being part of a supportive community is good for mental health – and research shows that attractive public spaces are a catalyst for building cohesive neighbourhoods.

Intriguingly, some well-being effects do seem to be entirely psychological. Just this year, researchers in Switzerland found that simply having a view of nature from your home can reduce your perception of noise – and the closer the green space, the bigger the effect. Attention restoration theory is the name given to one hypothesis that attempts to explain such effects. It says that everyday focused thinking is cognitively draining, with negative consequences for mood, and that the wide range of stimuli intrinsic to nature provide a restorative sensory environment that alleviates this attention fatigue.

"Some of the well-being effects of nature seem to be entirely psychological"

But that is as yet educated guesswork. "There's a lot going on. We have to be creative with our studies to try to isolate the different mechanisms," says Berman.

And it is only half the story. Besides mental health benefits, we know that healthy natural spaces provide us with a whole range of essential "ecosystem services" for free, from clean air and water to nutrient recycling, flood defence and pollination. Ideally, in designing or reconfiguring urban environments, we should aim to maximise the benefits for biodiversity too. How do we do that?

Urban latecomers

Although the first cities arose some 6000 years ago, it is only in the 20th century that urban living really took off – and only in the past decade or so that humanity became a majority-urban species

