

# Social isolation and loneliness linked to poor health—our study could help explain why

December 13 2023, by Timothy Matthews and Line Jee Hartmann Rasmussen

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Numerous studies have shown that social isolation and loneliness are associated with an [increased risk of early death](#), on a scale comparable to

other known risk factors such as smoking and obesity. This year, the US surgeon general declared social isolation and loneliness to be a [significant public health concern](#).

But scientists are still trying to untangle the physical processes behind the relationship. Our team's [recent study](#) showed that [social isolation](#) and [loneliness](#) seem to be associated with higher levels of inflammation, which goes hand in hand with many health problems.

Researchers have argued that a desire for [social connection](#) — and, conversely, an aversion to social disconnection — is [part of our evolutionary heritage](#). As a species, humans are not particularly big, strong or fast, but we are highly social, and our ancestors' chances of survival and reproductive success would have relied on the principle of safety in numbers. Being cut off from the social group represents a threat to your safety.

The [immune system](#) is one of several processes in the body that come into play under this scenario. A lone individual without the protection of a [social group](#) would be at greater risk of injury, and it therefore makes sense that the immune system would respond by preparing itself to battle off infection. This [inflammatory response](#) protects you in the short term. However, it is not ideal for your body to be in this stressed state for a prolonged period, and it could [exert a toll on your physical health over time](#).

In [our study published in November 2023](#) in the journal *Brain, Behavior, and Immunity*, we investigated the associations of social isolation and loneliness with markers of inflammation. Social isolation and loneliness are not the same thing. The former is an objective measure of your social connections, and the latter an emotion that can be experienced even when surrounded by other people. Both can have implications for mental and physical health.

In this study, we used data from three studies. Each of them had data on social isolation, loneliness and inflammation. Two of these studies followed participants from [early childhood](#) through to adulthood. This enabled us not only to test whether shortcomings in early social relationships foreshadowed increased inflammation later in life, but also to check whether any effects we found in one sample could be replicated in another sample.

We looked at three different markers of inflammation. Two of these, a protein made in the liver called [C-Reactive Protein](#) (CRP) and a type of protein involved in immune regulation called [Interleukin-6](#) (IL-6) have been used extensively in [medical research](#). The third, a protein called [Soluble Urokinase Plasminogen Activator Receptor \(suPAR\)](#), is a recently identified biomarker that research suggests is useful as an indicator of chronic (as opposed to acute) inflammation.

Our findings indicated that social isolation in childhood was correlated with all three markers of inflammation in adulthood, both at the ages of 18 and 45. When we controlled for factors such as smoking and body mass index—which could be alternative explanations for these associations—we found that social isolation remained specifically associated with elevated suPAR.

This finding was replicated in both of the [longitudinal studies](#). We also found that living alone was associated with elevated inflammation (particularly suPAR) among patients in a clinical sample.

Loneliness was also associated with inflammation, although the pattern was less consistent. There was a correlation between loneliness and elevated suPAR in midlife. But, in early adulthood (age 18), loneliness was associated with lower CRP. The latter, somewhat counter-intuitive finding, is harder to interpret, but it may reflect the fact that lonelier 18 year-olds are less likely to be socializing and [coming into contact with](#)

[pathogens](#).

## Towards a more connected future

Our findings highlight *\*suggest\** that social isolation experienced in childhood can foreshadow health issues decades later. Social connection is not just rewarding in its own right—there is now an abundance of research showing that social health goes hand-in-hand with [mental](#) and [physical](#) health. We often talk about social isolation as something mostly experienced by older adults. But, as our study shows, it is a problem for people of all ages.

Studying the way our social world intertwines with our biological world can help us unravel the complex web of factors that shapes long-term health.

This body of research shows us how important it is to think about how we can intervene to spare lonely and isolated young people from negative long-term health outcomes. To address this issue, we need to think about what it means to be "socially connected" in a world in which everyone is, seemingly, always connected to each other through digital media.

Modern technology has the potential to be a force for both good and bad when it comes to social [health](#), and we must think carefully about what role it has to play in tackling [isolation](#) and loneliness in society.

**More information:** Timothy Matthews et al, Social isolation, loneliness, and inflammation: A multi-cohort investigation in early and mid-adulthood, *Brain, Behavior, and Immunity* (2023). [DOI: 10.1016/j.bbi.2023.11.022](https://doi.org/10.1016/j.bbi.2023.11.022)

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Citation: Social isolation and loneliness linked to poor health—our study could help explain why (2023, December 13) retrieved 27 April 2024 from

<https://medicalxpress.com/news/2023-12-social-isolation-loneliness-linked-poor.html>

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