

# Years lived alone and/or serial break-ups strongly linked to inflammation in men

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Living alone for several years and/or experiencing serial relationship break-ups are strongly linked to raised levels of inflammatory markers in the blood—but only in men—finds a large population study published

online in the *Journal of Epidemiology & Community Health*.

Although the inflammation was classified as low grade, it was persistent, and most likely indicates a heightened risk of age-related ill health and death, suggest the researchers.

Divorce and committed relationship break-ups, which are often followed by a potentially lengthy period of living alone, have been associated with a heightened risk of poor physical and mental health, lowered immunity, and death.

But most previously published studies have focused on the impact of one partnership dissolution, and then usually only on marital break-ups.

The researchers therefore wanted to find out what impact an accumulated number of partnership break-ups or years lived alone might have on the immune system response in middle-age, and whether gender and educational attainment might be influential.

They drew on information submitted to the Copenhagen Aging and Midlife Biobank (CAMB) study by 4835 participants, all of whom were aged between 48 and 62.

Information on serial partnership break-ups, which included 83 deaths of the partner, was supplied by 4612 (3170 men and 1442 women); and information on the number of years lived alone was supplied by 4835 (3336 men and 1499 women) for the period 1986 to 2011.

Years lived alone were categorized as: under 1 year, defined as the reference group as this is very common and considered normal; 2–6 years; and 7 or more years.

Information on potentially influential factors was also obtained: age;

educational attainment; early major life events (loss of a parent, financial worries, family conflict, foster care); weight (BMI); long term conditions; medicines likely to affect inflammation (statins, steroids, non-steroidal anti-inflammatory drugs, immunosuppressants); recent bouts of inflammation; and personality trait scores (neuroticism, agreeableness, and conscientiousness).

The inflammatory markers interleukin 6 (IL-6) and C-reactive protein (CRP) were measured in blood samples.

Around half the participants had experienced a partnership break-up, and a similar percentage had lived more than 1 year alone (54% of women, 49% of men).

Around 1 in 5 had 10 or fewer years of education, and around 6 out of 10 had one or more long term conditions. Around half had experienced early major life events, and half of the women and almost two thirds of the men were overweight or obese.

Among men, the highest levels of inflammatory markers were found in those who had experienced the most partnership break-ups. They had 17% higher levels of inflammatory markers than those in the reference group. Similarly, levels of inflammatory markers were up to 12% higher in the group who had spent the most years living alone (7 or more).

And the highest levels of both inflammatory markers for years lived alone were observed among men with high [educational attainment](#) and 2–6 years living alone (CRP), and 7 or more years spent alone (IL-6).

But these findings were observed only among the men; no such associations were found among the women.

Men tend to externalize their behavior following a partnership break-up,

by drinking, for example, whereas women tend to internalize, manifest in depressive symptoms, which may influence inflammatory levels differently, note the researchers.

And the study only included a relatively small number of women (1499) which might also explain the discrepancy, they add.

This is an observational study, and as such, can't establish cause. And the researchers acknowledge that as the average age of the participants was 54, when the full consequences of exposure to inflammatory chemicals may not yet have peaked. Men also generate stronger inflammatory responses than [women](#) of the same age, they point out.

But immune system competence tends to tail off with age, often leading to systemic low grade inflammation which is thought to have a key role in several age-related diseases, such as cancer, cardiovascular disease, and type 2 diabetes, they explain.

"Small numbers of breakups or years lived alone is not in itself a risk of poor health, but the combination of (many) years lived alone and several break-ups is in our study shown to affect both CRP and IL-6 levels significantly," write the researchers.

"The levels of inflammation in our study are low, but they are also significant, clinically relevant, and most likely a risk factor for increased mortality," they point out, adding that there are "notable numbers of people living with low level inflammation."

They continue: "Since the number of one-person households has been increasing throughout the past 50–60 years in most high-income countries, this group of people going through relationship break-ups, or who are living on their own for different reasons, are part of at-risk groups."

**More information:** Do partnership dissolutions and living alone affect systemic chronic inflammation? *The Journal of Epidemiology & Community Health*,

[jech.bmj.com/lookup/doi/10.1136//jech-2021-217422](http://jech.bmj.com/lookup/doi/10.1136//jech-2021-217422)

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