Should you not have kids because of climate change? It's complicated.

Some researchers have claimed the best thing to do for the environment is to have fewer children. The truth is more complicated.

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When Meera Sanghani-Jorgensen was in her 30s, she and her husband began to discuss having children. They both wanted to have kids, but Sanghani-Jorgensen couldn't shake the feeling that, by giving birth, she might be doing something bad for the earth.

"I wanted to have a child, but I was also looking at the planet and thinking: 'Well, what kind of future will we have if there's more of the same?' " she said. She thought about the diapers, the party favors, the toys, and the billions of tons of carbon emissions warming the planet every year. She felt weighed down by the consumption of her children before they were even born.

After much research, Sanghani-Jorgensen and her husband decided that having a child — a single child — could fulfill their desires without putting undue burden on an overheating world. "I was very particular about only having one," she said.

Her husband died in 2012; in the years since her daughter was born, Sanghani-Jorgensen, 48, considered having a second child many times, but always held back. "My reservation has been exactly environmental concerns," she said. Her daughter is now 13 years old.

Sanghani-Jorgensen is not alone. She joins a generation of people living in the U.S. and other rich countries preoccupied with how having children may worsen the world's rapid warming.

The movement isn't huge, but it has gained widespread attention. According to a 2021 Pew Research Center survey of childless adults, 5 percent of those who cited a specific reason for not having children said it was because of "climate change/the environment." Thoughtful essays have been written on the topic; activist groups and support networks have been formed and then dissolved. In a letter to investors last year, Morgan Stanley analysts noted that the "movement to not have children owing to fears over climate change is growing and impacting fertility rates quicker than any preceding trend in the field of fertility decline."

Yet research on the question has a surprising history, and some of the findings may already be out of date.

The same year that Sanghani-Jorgensen's daughter was born, two scientists at Oregon State University published a paper estimating that each child born in the United States adds thousands of tons of carbon dioxide to their parents' lifetime "carbon legacy." Those findings were later repackaged in a 2017 literature review by two sustainability scientists, who calculated that opting out of having a child would reduce emissions by approximately 60 metric tons per year, an amount that positively dwarfed the other possible actions (living car free: 2.4 tons of emissions avoided; skipping one transatlantic flight: 1.6 tons). Their paper fueled intense media attention — to date, it has been downloaded more than 850,000 times.

"Want to save the planet? Have fewer children," read one headline in the Guardian. "Science proves kids are bad for the Earth," declared another in NBC News.

In recent years, however, some climate experts have questioned the science underpinning such calculations. Others reject the idea that parents should feel responsible for the greenhouse gas emissions of their children.

There are, no doubt, environmental consequences to having children. But the question of whether to have kids in a warming world has started to shift from fears over what children will do to the climate to fears over what the climate will do to them.

Since before the Industrial Revolution, the planet has warmed nearly 1.2 degrees Celsius (or 2.1 degrees Fahrenheit), thanks to the fossil fuels that humanity has unearthed and burned, sending a heavy layer of carbon dioxide into the atmosphere. At the same time, the world's population has continued to grow. In 1960, there were 3 billion people alive, a fact that caused hand-wringing and fear of worldwide famines. Last month, the world's population reached 8 billion. According to one demographic estimate, 7 percent of all the people who have ever lived – starting from the origins of humanity about 200,000 years ago – are still alive today.

Population concerns have an unsavory history: Writers and thinkers have warned about unrestrained population growth for hundreds of years — often engaging in fringe ideas about forced sterilization and eugenics of people living in developing countries. But in the past decade or so, the worries have been more individual, personal, and rooted in Western consumption and responsibility. As of 2020, the average American had a carbon footprint — calculated by dividing the emissions of the country by its number of inhabitants — of around 14 metric tons of CO_2 per year, one of the highest in the world. (The average Indian citizen has a footprint closer to 1.77 tons per year.) Matthew Schneider-Mayerson, a professor of English at Colby College who is writing a book about reproduction and climate change, interviewed many Americans concerned about having children in an age of climate change. He found that a majority of his participants were "very" or "extremely" concerned about the carbon footprint aspect of having another child. "Adding another American to the mix is not a morally neutral act," one respondent said.

"Any children we have in the developed parts of the world will be incredibly environmentally expensive," said Travis Rieder, a bioethicist at Johns Hopkins University who has argued for a shift toward smaller families. "And they might go on to have kids who also consume more than their fair share."

But the scientific data around the carbon impact of having children is relatively slim. To date, the 2009 paper by two Oregon State University scientists is the only original piece of academic research on the question. And that paper took an unusual approach. In an attempt to quantify *all* potential future carbon emissions of a child, the researchers assumed that a mother and father were each responsible for one-half of the emissions of their future child, one-quarter of their grandchild's emissions, one-eighth of their great-grandchild's emissions, and so on until the year 2400 — or until the family line died out.

That assumption resulted in extremely high estimates for the carbon impact of having a child. According to the study, having a child in a developed country like Russia, the United States or Japan, would result in approximately 60 metric tons per year in CO_2 emissions — an amount roughly equivalent to putting 13 gas-powered cars on the road for a year. When those numbers were compared to other individual climate actions, in the 2017 study, they looked even more stark.

That idea — that having one fewer child is the most important carbon-cutting move to make — has moved into society. Schneider-Mayerson says that many of the climate-concerned individuals he surveyed were familiar with the 2009 study, or at least its central finding; some even cited it as the moment when they definitively chose to *not* have children.

But several experts have argued for a different approach to assessing the contribution of having a child to climate change.

First, as Schneider-Mayerson points out, the 2009 study makes the current generation responsible for emissions *hundreds of years* into the future; by that logic, children born today are responsible for none of their carbon emissions – nor are their children or grandchildren. "It's the problem of double-counting," he said. "This suggests that a person is not responsible for their emissions if their parent chose to have them — which doesn't seem appropriate."

Moreover, the study's central estimate of the "carbon legacy" of having a child also assumes that the world makes absolutely no progress on shifting the economy away from fossil fuels from 2009 to 2400. "It's very egregious in that respect," said Zeke Hausfather, the climate research lead at the payments company Stripe, who has contributed to past reports by the U.N. Intergovernmental Panel on Climate Change. "It not only assumes that we don't decarbonize during the life of the child, but also that we don't decarbonize during the life of *their* children, or their children's children." (The authors of the 2009 study declined to be interviewed on the record for this story.)

And carbon footprints of people living in wealthy countries have already begun to change. According to analysis from the energy and economics firm Rhodium Group conducted for The Washington Post, an American born in 1950 will, over the course of their lives, be responsible for, on average, 19 metric tons of CO_2 per year. That person will have spent most of their life using energy provided by coal and other fossil fuels and driving heavily gas-guzzling cars. On the other hand, even if the United States doesn't pass any new climate policy between now and 2100, a child born today will have an average carbon footprint of about half of their grandparents': that's because renewable energy has gotten cheaper, and natural gas has largely replaced coal.

Kimberly Nicholas, a professor of sustainability science at Lund University and one of the authors of the 2017 literature review, says that she still believes it is reasonable to trace the emissions of a child through multiple generations. "I think it's a fair comparison," she said. But she ultimately doesn't think that the decision to have a child should come down to carbon footprint. "The numbers are the numbers," she said. "But what you do with them — and how they influence your decision-making — depends on the person."

If the United States reaches its climate goals – that is, cutting emissions in half by 2030 and to zero by 2050 – the picture looks even more different. In that case, a child born today would have a carbon footprint averaged over their lives of around 2.8 tons per year, not far from a current resident of Brazil. Under that scenario, having one fewer child starts to look on a par with living car-free or skipping a transatlantic flight — significant, but not even the most important individual action one can take.

(That estimate doesn't include emissions from outside the United States, such as the carbon dioxide released to produce goods that Americans import. But if current imports and exports were taken into account, U.S. emissions would only be about 6 percent higher.)

The central issue, Hausfather said in an email, is that *humans* don't cause carbon emissions — fossil fuels cause carbon emissions. A planet with only 4 billion people but an energy system still tied to oil, natural gas and coal, would still emit more carbon than the planet could handle (that is, any amount in excess of what can be absorbed by oceans and land).

And climate change needs to be addressed within the next few decades. According to one study in the Proceedings of the National Academy of Sciences, even a draconian worldwide one-child policy, instituted today, would still result in about 7 billion people in the year 2100. Less than the current United Nations estimate of 11 billion, perhaps, but still enough to burn a great deal of fossil fuels.

On the flip side, if countries decarbonize by switching to clean energy, "it doesn't matter how many people are on the planet," Hausfather said. "It comes down to: 'How hopeful are you that society can solve this problem?'"

Rieder, the bioethicist, argues that while deciding to have a smaller family won't overturn the problem of climate change, it can still be an ethically sound decision. "You have a good moral reason to be part of the solution, not part of the problem — even when your part is infinitesimally small," he said. At the same time, climate change is only one segment of the world's environmental problems — albeit the most existential one. Human population also encroaches on wildlife, takes up land, and a thousand other things that weigh heavily on the earth. "We might be carbon neutral in a few generations," he said. "But what about their food use and their fresh water needs?"

Some women reject the framing that a child is a small carbon bomb waiting to go off. Josephine Ferorelli, a yoga teacher, and Meghan Kallman, a sociologist and state senator for Rhode Island, met through a friend almost a decade ago and bonded over their concerns about children and the warming planet. They eventually founded a group known as "Conceivable Future," a network that hosts house parties for people to discuss their feelings about the topic.

Part of their goal now, they say, is to try to help women voice — and ultimately set aside — feelings of individual guilt around having kids. They argue that individual parents aren't responsible for a system-wide problem. "I hope that when people come to a house party with us, what they leave with is at least an unburdening of the 'carbon footprint' way of thinking," Ferorelli said.

But the other side of the equation — the worry about what kind of future today's children will experience — is more difficult to untangle. The irony is that even as the footprint of a child born in the developed world is decreasing, the impacts of climate change that child will experience are *in*creasing – and in some cases much faster than scientists had expected. All across the world are already facing days filled with choking wildfire smoke, catastrophic floods, and dangerous heat waves. A child born today will likely still be alive in 2100, at which point warming could have doubled.

Camila Thorndike, a 35-year-old who lives in Washington, D.C. and is the director of policy programs at the nonprofit climate group Rewiring America, first started thinking about climate change and having children when she was in eighth grade. She says that much of her hesitation now to have a child is rooted in fear over what their future will look like. "It's coming partly from a place of love for my hypothetical child," she said. "I want to protect them from suffering. Not that life is ever free from suffering, but … what of the joys and peace and goodness that make me happiest to be alive will be accessible in 20, 30, 40 years?"

Other women have ended relationships over this question. Laurel, a 33-year-old from Wisconsin who asked to be identified only by her first name, divorced her first husband partly because he wanted to have children and she, worried about a climate-changed future, didn't want to. "With the uncertainty of the world right now – it doesn't feel safe," she said. "I wouldn't want to subject my children to that." She is now remarried to a man who also wants to stay child-free.

Such concerns have no easy answer. Many people, perhaps, would choose not to have children if they knew with certainty that extinction-level warming were right around the corner. On the flip side, more people might choose to have children if they knew with certainty that countries would rally to end greenhouse gas emissions and create a more sustainable society. The in-between is where it gets difficult. Should you still have kids if they will grow up with smoke-filled summers and steadily rising sea-levels? Should you have kids if the developed, Western world will suffer minimal losses but developing countries will suffer hugely?

Hausfather, the climate scientist, argues that climate is more of a threat multiplier — something that will make political and economic upheaval much more likely. "It's up to us to decide if it's going to be an apocalyptic hellscape," he said. "And it depends on a lot of factors beyond just climate change."

Thorndike, who has gone back and forth for many years about whether or not to have children, says that she now has a lot of humility about the decision. "My perspective has changed so many times over the last 20 years," she said. "It's a decision that no one can make for another person. And I allow myself the space for that uncertainty."