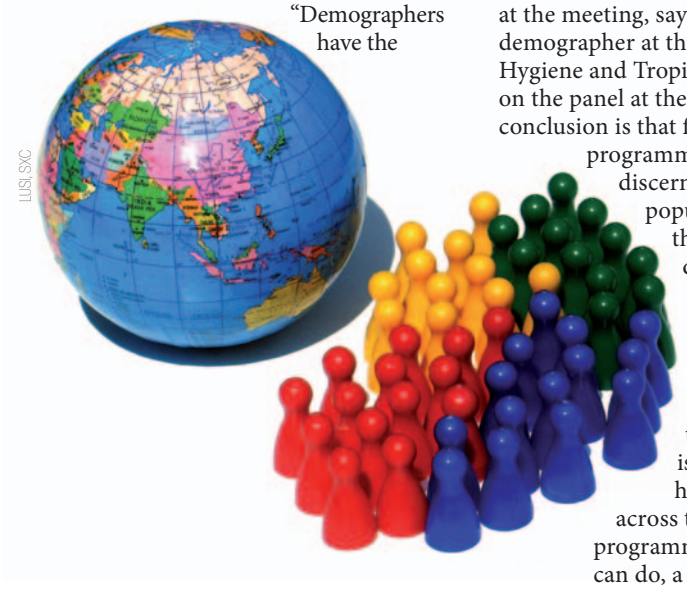
The population problem

By 2050, there will be an estimated 9 billion humans on the planet. **Kerri Smith** asks whether curbing the world's burgeoning population could help in tackling climate change.

When Brian O'Neill migrated to population research six years ago, he was surprised to find it a rather sparsely populated field. Looking for a wider-angle approach to the work he did in climate modelling, he decided to address the one important factor that he felt was being left out of emissions projections. Put simply, that factor was people: how many there are, how old they are and where they live. Unexpectedly, few other researchers were taking this kind of population information into account. "I entered a sparsely populated area of demography," he says.

With one foot in each camp, O'Neill, who is now based at the US National Center for Atmospheric Research in Boulder, Colorado, is ideally placed to gauge why research on population seldom enters into climate change equations. "The assumption of emissions scientists is that population isn't really important," he says. But, he adds, it doesn't help that it's also a politically sticky topic. Say the words 'population policy', and many people still think of China's one-child system, or campaigns of forced sterilization.

O'Neill is not alone in feeling that, as a population researcher, he is left a little in the cold when it comes to issues of climate. "Demographers have the feeling that they're not welcome in debates on sustainable development, especially those about climate change," says Thomas Buettner, deputy director of the UN Population Division, based in New York.



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World population is expected to reach 9 billion people by 2050.

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Last month, however, population policy was in the spotlight at one of the year's largest demography gatherings, the annual meeting of the Population Association of America, which ran from 17 to 19 April in New Orleans. One session was given over to discussion of a new book by Columbia University historian Matthew Connelly. In *Fatal Misconception: The Struggle to Control World Population*[1], Connelly details the sometimes murky history of the family-planning movement.

The book caused quite a storm at the meeting, says John Cleland, a demographer at the London School of Hygiene and Tropical Medicine who was on the panel at the conference. Connelly's conclusion is that family-planning programmes haven't made any discernible difference to population growth, a view that Cleland vehemently disagrees with. "No serious demographer believes that," he says. He adds that opinions like this make it hard to convince people that population policy is necessary — and hard to get the message across that population programmes have done, and can do, a lot of good. But even if attitudes towards population policies softened, what could such programmes actually do to help mitigate climate change?

THE EMISSIONS EQUATION

It is broadly thought that a larger population leads to greater emissions. On a global scale, per capita carbon dioxide emissions from fossil fuels have hardly changed since 1970, hovering around the 1.2-tonne mark (Fig. 1). This average varies hugely from nation to nation, but the general trend is that as the population has grown, emissions have increased in proportion[2]. The world population currently stands at around 6.7 billion, up from 1 billion in 1830, and the United Nations projects that 9 billion people will share the Earth — and generate the associated emissions — by 2050. So on the face of it, having fewer people might look like one reasonable approach to mitigating climate change.

Fred Meyerson, an ecologist, demographer and environmental policy researcher at the University of Rhode Island, is an enthusiastic proponent of this approach. His contention is that if emissions per person are fairly stable over time, an increase in population will have the knock-on effect of an increase in emissions[3].

Reducing unintended births, he argues, could be a useful place to start when trying to tackle climate change. And these births, he suggests, are there to be reduced: in the United States alone, almost half of all pregnancies are unintended[4]. Meyerson is careful to point out that such a scheme is a world away from the coercive policies that have rightly drawn so much criticism in the past. Instead, he suggests not only making sure that reproductive health services and contraception are supplied, but also concentrating on increasing the awareness of and demand for these services.

What is more, Meyerson adds, population policies, for all the controversy that a minority of them have attracted, have historically been more successful than policies seeking to decrease

emissions. Whereas population growth has been slowing since the mid-1960s, thanks in large part to careful family planning, "we have been bad at working on per capita emissions at all scales you care to think about," he says.

But the devil is in the details, and the population–emissions equation that Meyerson is working with is far too simplistic, say his critics. Many people in the developing world actually desire larger families, so reducing unwanted or unintended fertility would not have a big impact in many places, says Joseph Chamie, former director of the UN Population Division and now at the Centre for Migration Studies in New York. In addition, inhabitants of the developing world have lower per capita emissions in the first place. "Of course reducing population growth helps," Chamie says. "But it's not enough."

Reducing population growth in Niger, for example, where the population size is predicted to triple by mid-century, would not have a dramatic effect on emissions right now. And in many countries in Europe — where reducing emissions levels is more pressing — populations are declining, so a demography-based climate strategy would be ineffective. In a generation's time, however, when developing countries begin industrializing apace, a large population could be bad news.

Terry Barker, director of the Cambridge Centre for Climate Change Mitigation Research, UK, suggests that population changes are too far removed from climate change mitigation to be considered as a policy option. "My view is that we have to solve the climate problem directly by decarbonizing the world economy urgently, and that population changes over the next 50 years or so will not make much difference," he says. That's not to say that population policies should not be pursued in their own right: regardless of any of these arguments for or against its effects on climate change, Chamie argues, reducing unintended fertility is worth doing.

EMOLDINO

Population policy has been a sticky topic in climate change discussions, mainly owing to negative associations with China's one-child system and with campaigns of forced sterilization.

GENERATIONS AHEAD

Meyerson believes that population policies could have an immediate effect if they are built into our thinking on climate change here and now. But demography could offer some aid for climate problems on a much longer timescale, too.

Demographers are used to thinking ahead a few generations, when today's one-year-olds have families themselves and the impacts of population changes taking place now catch up. "The ship Demography moves slowly," says Buettner. Indeed, population policies in the 1950s and 1960s have already helped stop climate change from being worse and occurring earlier, he believes. "If nothing had happened [at that time], world population could easily have been 2 or 3 billion more people by now."

This is why we need to start taking notice of population effects today, says O'Neill. "Population policy can have immediate impacts on lots of things, but effects on total population size aren't significant for generations," he says.

And it's not only the sheer size of populations that matters to emissions levels. Other aspects, such as rates of ageing and urbanization, are also poorly accounted for in many climate change models, says O'Neill. His team used internationally recognized climate change projections from the Intergovernmental Panel on Climate Change, but none of the 40 scenarios they looked at attempted to isolate the effects of population. He is currently working on putting that right, together with colleagues from the International Institute for Applied Systems Analysis in Vienna, Austria.

The team became interested in the effects of ageing on emissions, making the assumption that as a population ages its economy slows and hence its emissions fall. When they looked at future emissions for the United States, taking ageing into

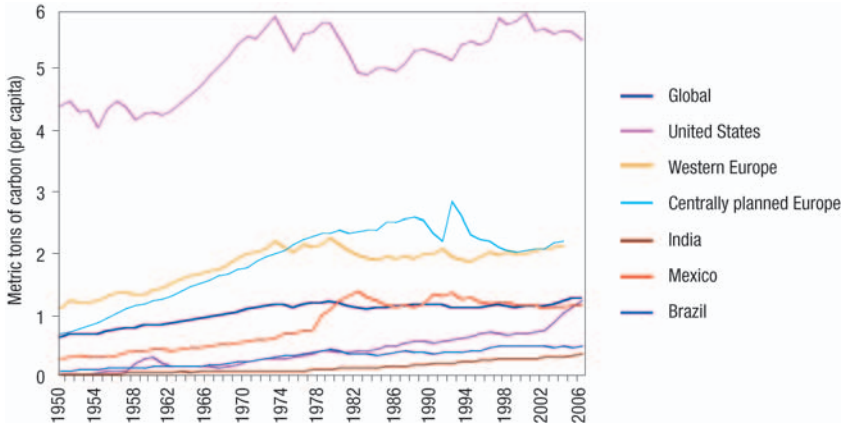

Figure 1 Per capita global greenhouse gas emissions 1950–2006. Graph from ref. 3, courtesy of Frederick Meyerson.

account, the results of their models implied that with a relatively high — but realistic — rate of ageing, emissions would be one-third lower by the second half of this century than many standard models predict. This reduction could be even more pronounced in faster-ageing regions such as western Europe and Japan[5].

This might sound like good news for reducing greenhouse gases. But ageing is only one factor in the mix, and other changes can send emissions soaring. Urbanization is one of them, and scenarios in which O'Neill and his colleagues have included this as a factor make depressing reading. In unpublished work presented at the annual meeting of the Population Association of America last year, they concluded that the effect of people moving from country to town in China could swell emissions up to 40 per cent above what's expected by the middle of the century[6].

Nobody is arguing that population policies provide a 'one-stop shop' for reducing emissions. And their effects are likely to be a lot more complex than the simplistic 'fewer people equals less emissions' view. "I don't expect it to be a silver bullet," says O'Neill. "Low population scenarios can produce a very wide range of emissions."

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But thinking about population provides another way of viewing the problem, a new perspective that we ignore at our peril. "The population movement has, without knowing it, done much to limit the effects of modern life," says Buettner. The effect it could have on the quintessentially modern issue of climate change is something that's definitely worth looking into further, says O'Neill. "Demographers have a lot to say about it. If they're not active enough, then we're going to miss out."

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Kerri Smith is a podcast editor and reporter for Nature.