Voluntary family planning to minimise and mitigate climate change

John Guillebaud calls for action to tackle the effect of a rapidly growing world population on greenhouse gas production

Simply put, climate change is caused by excessive production of greenhouse gases. As highlighted by the late Professor Tony McMichael, the "cause(s) of the causes" should not be overlooked.[1] With climate change already close to an irreversible tipping point, urgent action is needed to reduce not only our mean (carbon) footprints but also the "number of feet"—that is, the growing population either already creating large footprints or aspiring to do so. Wise and compassionate promotion of contraceptive care and education in a rights based, culturally appropriate framework offers a cost effective strategy to reduce greenhouse gases. This article outlines the evidence for voluntary accessible family planning as a strategy to reduce greenhouse gas emissions and mitigate climate change.

Every week, world population increases by 1.5 million
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What is the relation between population and environmental impact?

During 1971-72, Ehrlich and Holdren identified three factors that create humanity's environmental (including climatic) impact, related by a simple equation[2]:

$$\text{Environmental impact, } I = P \times A \times T$$

in which A is affluence (material consumption and the concomitant "effluence" of pollutants such as carbon dioxide (CO_2) per person); T is technology impact per person (in which fossil fuels measure more highly than solar based energy); and P is population (the number of people).

Population's effect on the other two factors is multiplicative. Reducing P can reduce environmental impact if the other factors are constant. In fig 1, for example, fewer people requiring food would manifestly reduce the startling 30% of greenhouse gas emissions from agriculture and meat production combined (including CO_2 from deforestation, methane from livestock, and nitrous oxide from fertilisers).[3] That said, other contributory factors, including the worldwide trend towards higher meat consumption, must also be reversed.

KEY MESSAGES

- Family planning is preventive medicine and could bring more benefits to more people at less cost than any other single available technology
- Benignly delivered, family planning reduces greenhouse gas emissions and also conserves habitats
- The low carbon benefit of one less birth is greater in affluent settings than in poorer ones
- Climate concerned health professionals should therefore promote parental replacement fertility
- Action on population growth as well as technology and consumption is essential to ensure that climate mayhem is both minimised and mitigated

Population trends

Since 1850, substantial lowering of death rates, first through public health and later through antibiotics, along with slow falls in birth rates, have led to a global population of more than 7400 million people by June 2016, a sevenfold increase.

The total fertility rate is the projected mean number of children born to an average woman in her lifetime on current demographic assumptions or, in shorthand, the "average family size." Given world average mortality, countries achieving total fertility rates of 2.1 have replacement fertility, yet their populations continue to increase for roughly 60 years because of demographic momentum (see below). Since the mid-20th century the world's mean fertility rate has reduced from 5.2 to 2.5, and 46% of people live where the mean family size is equal to or below parental replacement fertility.[4] In 2013 an influential film by Hans Rosling, *Don't Panic—The Facts About Population*,[5] suggested that the population problem was essentially solved.

However, there is some "bad news." Firstly, fertility patterns vary by country: 45% of the world lives in areas where total fertility rates range from 2.1 to 5, and 9% where they exceed 5. In the 48 countries designated by the United Nations as least developed, population is projected to triple by 2100.[4] In much of sub-Saharan Africa fertility reduction has

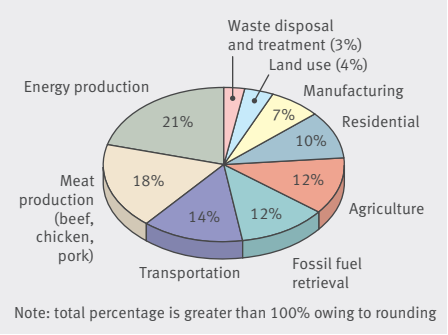

Fig 1 | Greenhouse gas emissions, as percentage of the world annual total[3]

stalled.[6 7] The UN's latest median world population projection of 11.2 billion by 2100 is predicated on continuing reductions in fertility rate; without them, the constant fertility variant projects to roughly 28 billion by 2100.[3]

A second problem is "inexorable demographic momentum" as a result of the population "bulge" of young people who were born when fertility rates were higher and are yet to start their families. That phrase was used in a widely publicised scenario based report *Human Population Reduction is not a Quick Fix for Environmental Problems*.[8] However, the scenarios have been criticised for ignoring country-to-country variability and hence understating the "enormous social and economic benefits that family planning adopting nations have experienced in one generation compared with their non-adopting neighbours"—that is, the benefits are not long delayed.[9 10]

Voluntary family planning omitted in climate change coverage

As already noted, three factors affect environmental impact, yet most climate change discussions focus only on technology and consumption. Even if unremitting population growth is recognised (as, for example, in the *Living Planet Report* by the World Wide Fund for Nature with the Global Footprint Network)[11] it is usually treated as a "given," something to be measured and (hopefully) adapted to, not as something that is sensitive to policy intervention. This is analogous to monitoring a bucket that is filled from a running tap and, when it's close to overflowing, discussing complex measures to make the only available bucket larger, rather than turning off the tap. Doctors can have an important role in putting family planning on to the agenda (box 1).

Effective voluntary family planning

Voluntary family planning empowers women through the basic human right to have children by choice and not by chance. While prioritising reproductive rights, this scenario requires the removal of multiple barriers to accessing contraception.

These barriers are formidable in low resource settings but present everywhere. They can be tangible (eg, inadequate resourcing or maintenance of contraceptive supplies, child marriage, or sexual abuse) and intangible (eg, cultural and familial pronatalism, religious or partner opposition to contraception, fatalism, or myths and exaggerations about contraceptive side effects).[12-14] These barriers can primarily be tackled by education, in the media as well as in schools.[12-14]

Nations as culturally and politically diverse as Bangladesh and Brazil, Columbia and Cuba, Thailand and Tunisia, and regions such as Kerala in India, have halved their fertility rates in about the same time as China, yet without a coercive one child policy.[13 15 16]

Some support for family planning as an intervention has existed, intermittently, from the early days of climate concern.[17-21] More recently, the Royal Society's 2012 report on climate change, *People and the Planet*, highlighted "the importance of both slowing population growth and reducing per capita CO_2 emissions to stabilise the global climate" (box 2).[23] And, after decades of silence, in 2014 the Intergovernmental Panel on Climate Change (IPCC) stated, "CO_2 emissions could be lower by 30% by 2100 if access to contraception was provided to those women expressing a need for it ... This is important not only in poor countries, however, but also some rich ones like the United States, where there is unmet need for reproductive health services as well as high CO_2 emissions per capita."[24]

How does having one less child benefit the climate?

In 2009 it was calculated that by adopting available "eco-friendly" actions, including meticulous recycling, an American couple could curb their lifetime carbon footprint by 486 tonnes. Simply by having one less child, an American woman would reduce her "carbon legacy" (the summed emissions of herself and her descendants weighted by relatedness) by 9441 tonnes.[25] This is around 20-fold (10-fold in the United Kingdom) more than would be saved by other eco-actions. People in high income countries have the largest footprints[26]: one estimate is that each new UK baby will ultimately be responsible for roughly 35 times more greenhouse gas emissions than one in Bangladesh.[27]

For US and UK citizens these calculations support choosing a smaller family, even if

Box 1 Doctors, family planning, and climate change

Medical science bears much responsibility—albeit without intent—for the population "explosion" of the past 200 years, since the otherwise wholly good intervention of lowering death rates has created demographic imbalance. So, aside from choosing to have a small family, what can a climate concerned clinician do?

- Advocate for voluntary family planning. Contraception is a superb preventive medicine, reducing maternal and infant mortality and morbidity,[6 12] teenage conceptions, and the incidence of (unsafe) abortion[6]
- Promote parenteral and intrauterine long acting contraceptives, which are the most effective and require a medically trained provider
- Support organisations acting on population growth such as Population Matters (www.populationmatters.org), Population and Sustainability Network (www.populationandsustainability.org), and PopOffsets (www.popoffsets.org), which helps people and organisations to offset their carbon emission by funding family planning around the world

Box 2 Recent activity in world family planning

- The 2012 London Family Planning Summit won promises of $4.6bn (£3.2bn; €4.1bn) from donors and developing countries to provide all requirements for modern contraception for an extra 120 million women by 2020[13]
- The Family Planning 2020 global partnership (www.familyplanning2020.org) followed with the ambition to assist the estimated 225 million who wish to avoid a pregnancy but are not using a modern contraceptive
- Target 3.7 in the UN's third sustainable goal—to ensure healthy lives and promote wellbeing—reads: "By 2030, ensure universal access to sexual and reproductive healthcare services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes"[22]
- The UN climate change summit in Paris, December 2015, gave no prominence to the benign measures that could halt population increase. Ongoing taboos continue to "quarantine" this major component of humanity's predicament

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Box 3 Costs and cost effectiveness

- The international community has invested $400bn over 50 years in the 20 least developed countries that have the highest birth rates, implicitly assuming that socioeconomic development will lead automatically to smaller families
- Of this sum, less than 1% has gone explicitly into contraceptive care[33]
- Studies invariably show that family planning is highly cost effective compared with other emission abatement strategies.[3] Estimates vary: one study concluded that investment of $1-2 per capita in family planning abates one tonne of CO_2 emissions[34]
- Achieving the UN's low fertility scenario could contribute16-29% of the reduction in greenhouse gas emissions needed by 2050 to avoid global warming by 2°C[32]
- Fulfilling the unmet need for modern contraception among all women who state that they wish to delay or end childbearing requires investment in contraceptive care to be more than doubled from $4.1bn to $9.4bn annually[30]
- The amount required equates to <6 days of current US annual expenditure on defence ($598bn)[35]

they can provide for a larger one. The charity Population Matters promotes a voluntary guideline of a worldwide maximum of two children, which would make an important collective difference to emissions. It is unfair for people in high income countries to focus on reducing population growth in low income countries as the main climate intervention, especially when accompanied by inaction about their own much larger emissions.

Two facts are incontrovertible: our finite planet will not support unending growth (roughly 82 million people annually), and once 2.1 becomes the mean family size, population growth will eventually cease. So why should it be controversial to propose that this parental replacement fertility becomes the accepted upper norm?

The obstacles are massive, including a feeling among many people, often reinforced by culture and religion, that they cannot satisfy their parental instincts by having only one or two children. Such attitudes may trump a more altruistic decision by people to consider their climate legacy, changing their preferences in the interests of posterity and the biosphere.

Population and environmental education is key

There is a blind spot in all countries concerning the planet's finitude and the unsustainability of unremitting population growth. Education efforts can help people to understand these concepts, however, as interview data from Ethiopia have shown.[28] Environmental concerns, along with sexual and reproductive health, have been widely and successfully promoted through radio and television "soap operas" (see www.populationmedia.org).[14] These long running, culturally embedded dramas educate through their popular characters, torn between good and bad influences.

Access to contraceptives is highly variable, but access alone is not enough. The incidence of unplanned conceptions in both teenagers and adults in 2014[29] was 40% globally (around 80 million annually) and 49% in the ostensibly well educated US.[30] Any contraceptive may fail. A voluntary guideline must never penalise large families, in which child poverty is most common, and there must be a safety net for unintended or later order births. Crucially, to criticise parents at any level of affluence, anywhere, who have already had large families is decidedly unfair if, as is so common, their education and upbringing never brought this environmental dimension to their attention.

Myths, half truths, and realities of voluntary family planning

A persistent myth is that quantitative concern for human numbers is intrinsically coercive,[15] and in much of civil society this idea still inhibits rational discussion about population stabilisation. Can sensible people not unite in condemning both coercive contraception, which is indeed vile, and coercive conceptions that arise from women being denied access to the methods that they might choose should the applicable barriers be removed?

Fertility decline by country commonly precedes increases in wealth, and prosperity consistently accelerates after fertility rates fall (this happens sooner in countries where family planning is promoted).[7 10 31] Good family planning programmes have driven the fertility transition even where poverty and illiteracy prevailed.[7 32]

Despite such facts some have argued[5 13] that rising household wealth and improved child survival[7] are prerequisites to acceptance of small family sizes. This view promotes the continuing derisory funding of voluntary family planning services internationally (box 3). It is, however, based on the false assumption that couples in poverty decide to have many children for economic and "social security" reasons or because they anticipate high child mortality.[15] In reality, however, given that intercourse is always more frequent than would be required for intentional conceptions, in the absence of access to family planning having a larger rather than a smaller family is less of a planned decision than an automatic outcome of human sexuality.[13 15] Large families simply happen when people are not able not to have a large family. Small families do, however, result through choice when women have easy access to education and family planning. Identifying and removing barriers to such access in every setting must be prioritised.[13 15] One such barrier is the Vatican's prohibition of modern contraceptives. The ban disproportionately affects Catholics in poorer settings[7] and persists despite pressure to relax this stance, most recently with respect to avoidance of pregnancy where exposure to the Zika virus is likely.[36]

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