

# Climate change and contraception

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Global climate change represents a grave threat to the future of human welfare and our natural environment.<sup>1</sup> The contentious ongoing policy debate about potential interventions focuses on switching to renewable energy sources and increasing energy use efficiency. But given the urgency of the problem and the lack of political will, other approaches to limit greenhouse gas emissions should be given higher priority. Improving access to effective contraception is one such policy that has thus far been largely ignored by the international climate community.<sup>2</sup> This recommendation is based on three simple facts: (1) population growth is a key driver of climate change, (2) higher and more effective use of contraception reduces unplanned pregnancies and hence population growth, and (3) many more women and men would freely choose to use contraception if only it were available and acceptable. The authors' recommended policy is about improving universal access to reproductive technologies, not about coercion.

In 2100, our planet is expected to be home to 10.9 billion people, up from today's 7.7 billion.<sup>3</sup> This expansion of humanity will take place mostly in sub-Saharan Africa and South Asia.<sup>3</sup> Rapid population growth has pervasive adverse effects on societies, economies and the natural environment. In particular, with an additional 3 billion people producing greenhouse gases, the global warming problem will become even more intractable in the coming decades.

Slower future population growth could reduce emissions globally by an estimated 40% or more in the long term.<sup>4</sup> Over the next few decades, overall emissions from low-income countries are likely to rise because of a rise in emissions per capita from rapid industrialisation, as well as from increasing population. Emissions from high-income countries (which are much higher in absolute and per capita terms) are expected to level off or decline as populations in these regions stabilise or decline and carbon emissions per capita decline.<sup>5</sup>

Over the past half century, many governments have invested in voluntary family planning and reproductive health programmes to assist women to avoid unplanned pregnancy, thus reducing high fertility.<sup>6–7</sup> These programmes provide access to and information about contraception. The rationale for investing in these programmes is a well-documented and substantial unsatisfied demand for contraception.<sup>8–9</sup> Around the world, large proportions of married women report in surveys that they do not want a pregnancy at the time of the interview, either having reached their desired family size or preferring to postpone the next birth. But a substantial proportion of these women (more than half in some countries) risk pregnancy by not practising effective contraception. As a result, unplanned pregnancies are common in both the developed and developing world. Worldwide about 99 million unintended pregnancies occur each year—44% of all pregnancies. More than half of these unintended pregnancies end in an induced abortion (56 million per year) and the remainder in unintended births or miscarriages<sup>10</sup> (see [figure 1](#)).

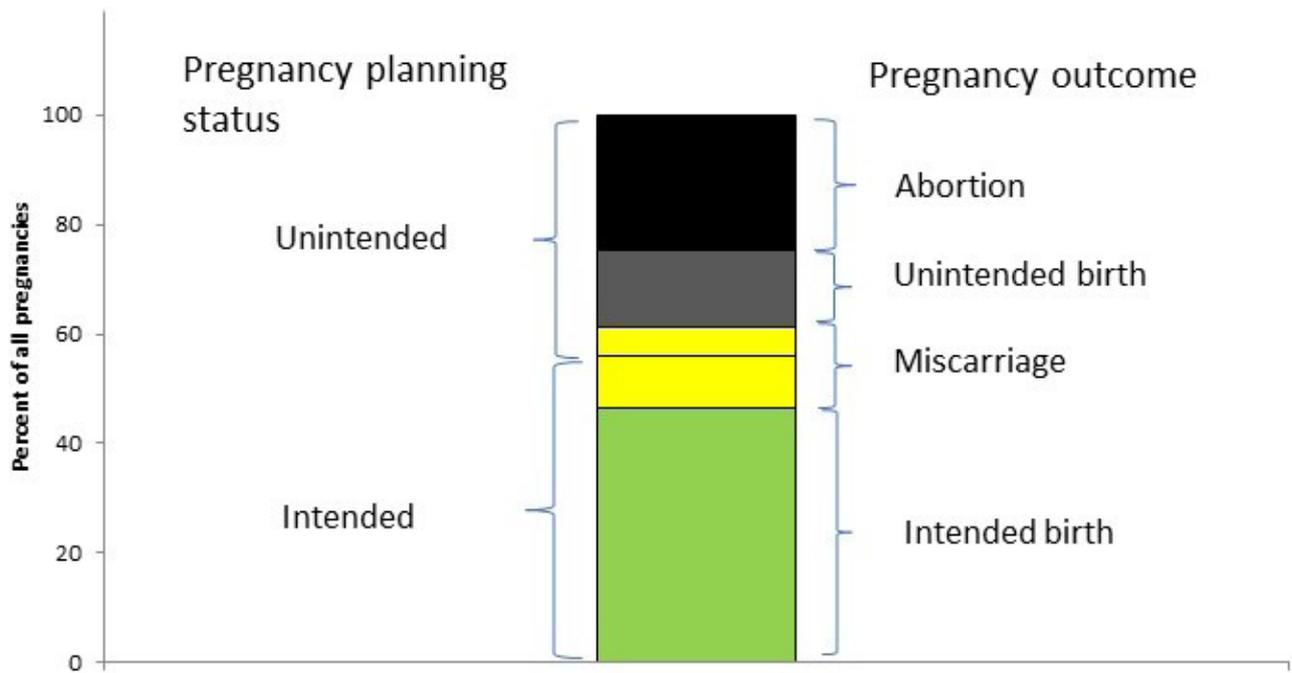
Why do some women who want to avoid pregnancy not use contraceptives? The answer lies in a mixture of social, economic, health and service-related reasons.<sup>8–11</sup> Lack of access to services and the relatively high cost of modern contraceptives are obvious obstacles for poor women, in particular in rural areas of the developing world. Addressing these issues is a key objective of family planning programmes which bring services to local communities and provide methods for free or at low cost. However, there are other, often more important, obstacles such as myths about hormones, traditional social norms and disapproval of husbands. In fact, fear of side effects and dissatisfaction with available methods are often the dominant reasons women are reluctant to use (or continue to use) contraception.<sup>8</sup>

Social norms dictate how people ought to behave, particularly in traditional



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**Figure 1** Planning status and outcome of all pregnancies worldwide, 2010–2015. (Source: 10 and authors' calculations).

societies where patriarchy is dominant; women are expected to follow the decisions of their husbands and community elders. These customs constrain the introduction of new behaviours such as fertility regulation in societies where it has been absent. Norms inhibiting women's ability to implement their reproductive intentions can be modified by appropriate media campaigns via print, radio or television.<sup>11</sup> It is important that such campaigns are developed in collaboration with community leaders and are sensitive to local customs. In addition, investing in men's and women's education, labour force opportunities, political participation and so on can lead to changing norms around women's roles in society and expectations around their ability to exercise their reproductive preferences.<sup>12</sup>

Concerns about contraceptive side effects can be addressed, at least in part, by providing careful counselling to overcome incorrect rumours about methods. Access to a wide range of options is essential to maximise the chances that clients' needs and concerns are satisfied at different times of their reproductive lives. Nevertheless, all existing contraceptive methods have some drawbacks in the view of some segments of potential users. It is therefore essential to expand research and development on novel and improved contraceptive methods.

Since the approval of the first contraceptive pill in 1960, the range of effective contraceptives has considerably expanded.<sup>13</sup> Long-acting reversible methods with the highest efficacy such as implants and intrauterine systems are now used by more than a hundred million women worldwide.<sup>14</sup> However, the insertion or removal of these systems requires trained health providers, who are not always available.

User-controlled methods such as vaginal rings have become popular. A novel contraceptive vaginal system (Annovera) for 1 year of use is expected to become available in the USA by the end of 2019.<sup>15 16</sup>

Still in an early stage of research are contraceptive methods for 1 month or on-demand use and biodegradable implants, all easier to administer. While the condom remains the recommended method to prevent both pregnancies and HIV or other sexually transmitted infections, more effective multipurpose prevention technologies, under the control of women, will reach the users in the near future.

Many men are willing to share responsibility for family planning, but their choices are limited to condoms, withdrawal and male sterilisation, which are not popular. Increasing options and services for men, addressing their concerns and dispelling myths will increase male engagement. Several male hormonal contraceptives are currently in development.<sup>17</sup> The most advanced is a transdermal gel effective in suppressing spermatogenesis while maintaining male habitus.<sup>18</sup>

Further into the future are non-hormonal contraceptives for women and men based on novel genomics and proteomic tools.<sup>19</sup> Additional attention to 'green' manufacturing and improved disposal of products should ensure minimal disruption of the environment.<sup>20</sup>

Improved contraceptive technologies will offer more choices to women and men, thus reducing unplanned births and abortions. However, there is no need to wait for innovations. Wider distribution of contraceptives already on the market through greater investment in voluntary but underfunded family planning programmes is sufficient to raise contraceptive use

substantially. This in turn would have a profound positive impact on human welfare, the climate and the environment.<sup>2 21 22</sup>

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## REFERENCES

- Intergovernmental Panel on Climate Change (IPCC). Climate change 2014: synthesis report IPCC; 2014.
- Bongaarts J, O'Neill BC, O'Neill B. Global warming policy: is population left out in the cold? *Science* 2018;361:650–2.
- United Nations. *World population prospects: the 2019 revision*. United Nations Population Division, 2019.
- O'Neill BC, Liddle B, Jiang L, *et al*. Demographic change and carbon dioxide emissions. *The Lancet* 2012;380:157–64.
- International Energy Agency. *World energy outlook 2018*. IEA, 2019.
- Cleland J, Bernstein S, Ezeh A, *et al*. Family planning: the unfinished agenda. *The Lancet* 2006;368:1810–27.
- May J. *World population policies: their origin, evolution and impact*. Springer, 2012.
- Casterline JB, Sinding SW. Unmet need for family planning in developing countries and implications for population policy. *Popul Dev Rev* 2000;26:691–723.
- Darroch JE, Audam S, Biddlecom A, *et al*. *Adding it up: investing in contraception and maternal and newborn health*. Guttmacher Institute, 2017.
- Bearak J, Popinchalk J, Alkema L, *et al*. Global, regional, and sub-regional trends in unintended pregnancy and its outcomes from 1990 to 2014: estimates from a Bayesian hierarchical model. *Lancet Global Health* 2018;64:e380–9.
- Bongaarts J, Cleland J, Townsend J, *et al*. *Family planning programs for the 21st century: rationale and design*. Population Council, 2012.
- Keleher H, Franklin L. Changing gendered norms about women and girls at the level of household and community: a review of the evidence. *Glob Public Health* 2008;3:42–57.
- United Nations, Department of Economic and Social Affairs, Population Division. *World contraceptive use 2017 (POP/DB/CP/Rev2017)*. United Nations, 2017.
- Townsend JW, Sitruk-Ware R, Williams K, *et al*. New strategies for providing hormonal contraception in developing countries. *Contraception* 2011;83:405–9.
- Archer DF, Merkatz RB, Bahamondes L, *et al*. Efficacy of the 1-year (13-cycle) segesterone acetate and ethinylestradiol contraceptive vaginal system: results of two multicentre, open-label, single-arm, phase 3 trials. *Lancet Glob Health* 2019;7:e1054–64.
- Gemzell-Danielsson K, Sitruk-Ware R, Creinin MD, *et al*. Segesterone acetate/ethinyl estradiol 12-month contraceptive vaginal system safety evaluation. *Contraception* 2019;99:323–8.
- Long JE, Lee MS, Blithe DL. Male contraceptive development: update on novel hormonal and nonhormonal methods. *Clin Chem* 2019;65:153–60.
- Roth MY, Shih G, Ilani N, *et al*. Acceptability of a transdermal gel-based male hormonal contraceptive in a randomized controlled trial. *Contraception* 2014;90:407–12.
- Aitken RJ, Baker MA, Doncel GF, *et al*. As the world grows: contraception in the 21st century. *J. Clin. Invest.* 2008;118:1330–43.
- Moore K, Townsend J, Spieler J, *et al*. A greenprint for sustainable contraceptive research and development. *Contraception* 2013;87:347–51.
- Anderson DJ. Population and the environment — time for another contraception revolution. *N Engl J Med* 2019;381:397–9.
- Emmott S. Though climate change is a crisis, the population threat is even worse. The guardian, 2015. Available: <https://www.theguardian.com/commentisfree/2015/dec/04/climate-change-population-crisis-paris-summit>