

Niger: Too Little, Too Late

“How Niger is going to feed a population growing from 11 million today to 50 million in 2050 in a semi-arid country that may be facing adverse climate change is unclear.”
—Lord Adair Turner

Niger—with the world’s fastest growing population, its highest total fertility rate (TFR), a small and diminishing amount of arable land, low annual rainfall, a high level of malnutrition, extremely low levels of education, gross gender inequities and an uncertain future in the face of climate change—is the most extreme example of a catastrophe that is likely to overtake the Sahel. The policies chosen by Niger’s government and the international community to reduce rapid population growth and the speed with which they are implemented are of the utmost importance. In this comment, we review the problems posed by Niger’s rapid population growth and the policy options proposed to confront it.

THE PROBLEM

Demographics and Family Planning Norms

By mid-2010, Niger had an estimated population of 15.9 million and a TFR of 7.4 births per woman.^{1,2} The urgent need to slow rapid population growth can be seen in projections of the country’s population based on the date at which it achieves replacement level fertility (Figure 1, page 96) and on what it would have looked like if the TFR had been lower in 1990 and declined more rapidly (Figure 2, page 97). The Population Reference Bureau estimates that if the country’s TFR falls to 3.8 by 2050 (a median projection, which is by no means certain), the population will reach 58.2 million, likely making it the second most populous country in West Africa. The United Nations (UN) projections for Niger are similar: a population of between 47 million (TFR, 3.2) and 59.0 million (TFR, 4.2) by 2050,^{3,4} reaching 98.5 million by 2100.⁵ However, according to an analysis of family planning trends in 13 West African nations (including Niger) between 1991 and 2004, contraceptive prevalence in the region increased by only 0.6% per year over that period, strongly suggesting that those UN projections are unduly optimistic.⁶ The UN medium projection assumes a TFR in 2050 of 3.8, which implies continued population growth to 2100 and beyond.⁷

Since 2002, contraceptives have been provided free in Niger, distribution has been outsourced and some radio programs promoting family planning have been launched; however, contraceptive prevalence remains low. In 2009,

11% of married Nigerien women aged 15–49 were practicing contraception,² and fewer than half (5%) relied on a modern method, generally oral contraceptives or the IUD.^{3,8} The most common reasons given for nonuse were a desire for more children, menopause and sterility.⁸ Given such low contraceptive prevalence, the country’s population continues to grow rapidly (Table 1, page 98), thus skewing the age structure of the population. Approximately 49% of the population is aged 15 or younger, and only 3% is aged 65 or older.² For the contraceptive prevalence to reach 55% (the level needed to reach a TFR of 3.8) by 2050, the number of users would need to increase more than 10 times.

Nigerien family and cultural dynamics largely represent male interests, and many women do not have the autonomy or freedom to manage childbearing. The country has not ratified the Maputo Protocol outlawing early marriage, the median age of marriage among women is 15.5² and the median age at first birth is 17.9.⁸ Niger is one of the few countries in the world with little or no overall unmet need for family planning, not because of access to contraceptive methods, but because of a strong pronatalist culture in which the desired family size is higher than the actual family size. In 2006, married women and men reported wanting an average of 8.8 and 12.6 children, respectively.⁸ More than one-quarter of women older than 40 have 10 or more children. Only one in 100 women want to have at most two children.

Development

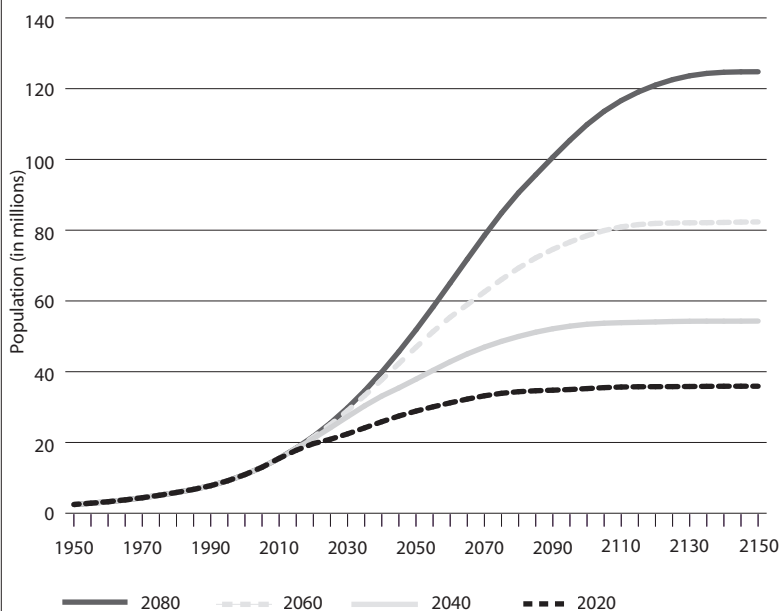
In 2008, Niger ranked 174 out of 178 countries on the Human Development Index, with more than 60% of its population living on less than US\$1 per day,⁹ and the country’s Gross National Income that year (\$330; purchasing power parity, \$680) was among the world’s lowest.¹⁰ Furthermore, recent economic growth (approximately 2% per year) has been lower than population growth (more than 3.9%).^{1,11} Niger’s high dependency ratio (i.e., the ratio of dependent people to the working-age population) of 108 per 100 undermines the potential to build up the savings needed to expand the country’s infrastructure.¹²

In 2007, only 15% of women in Niger had any primary education, and only 1% had completed primary school.⁸ The German Credit Bank is exploring ways of keeping girls in Niger in school; however, it seems extremely unlikely that investment in education will even keep school enrollment at a pace with population growth. By 2050, the

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FIGURE 1. Three cohort-component projections demonstrating the relative effect on population growth of reaching replacement level fertility in 2020, 2040, 2060 or 2080, Niger



Notes: Projections were created by modifying the 2010 revision of the World Population Prospects (medium variant) to include a linear decline in the net reproduction ratio to 1.00 in 2020, 2040, 2060 and 2080. Total fertility rate: 7.4 (2010). Unmet need for family planning: 16% (2008) Source: Venture Strategies for Health and Development, and African Institute for Development Policy.

school-age population will be eight times as large as it is today, yet the share of the government's general budget going to education has fallen over the last decade, from 15% to less than 10%.¹¹ Lack of education has clear implications for the overall development of the country.

It is also highly unlikely that Niger will have enough health care professionals to meet the needs of its exploding population. In 2000, there were 226 doctors, 13 pharmacists, 1,128 nurses and 334 midwives serving a population of 10.7 million people; seven years later, the number of health professionals had not grown even as rapidly as the population.^{11,13} The 2005 World Bank Report on Niger notes, "In the current state of affairs, the national human resource training system for the health sector is incapable of meeting such expanded needs. The public health training system is already experiencing huge difficulties."¹¹

Environmental Issues

The Sahel is one of the most fragile ecologies in the world. Only 12% of Niger's land area now receives enough rain to sustain agriculture,¹¹ and it is predicted that none of it will remain by 2100.¹⁴ Niger's soil is low in nutrients, poorly managed, overgrazed and losing up to 100 tons of topsoil from erosion per hectare per year.¹⁵ The amount of firewood used for cooking (two million tons annually) is twice the amount of natural replacement growth.¹⁶ Subsistence farmers and pastoralists in this landlocked country have weak links to domestic markets and even less access to imports such as improved seeds and fertilizers;

moreover, they lack financial institutions to lend money or insure against external shocks—and the animals people own as a capital investment die when the rains fail. Over several decades, grain output has been falling by an average of 0.6% annually.¹¹ New crop varieties of drought-resistant millet, sorghum and cowpea are being adopted; however, it seems unlikely that the yields will keep pace with population growth.

In August 2010, 12 million Nigeriens faced serious food shortages.¹⁷ That year, the World Food Programme provided emergency food aid to five million people, mainly infants and lactating women. Approximately 10% of children younger than five in Niger suffer from acute malnutrition, and 44% of children suffer from chronic malnutrition.¹⁸ According to a report released in 2010, Nigerian children aged two or younger are 72% more likely to be stunted if born during a drought.¹⁹

Future Scenarios

Predicting global warming at a regional or national level is difficult;²⁰ however, most climate scenarios paint a somber, even frightening, picture. According to the United Nations Environment Programme, "the Sahel is almost inevitably heading towards an environmental disaster."

A likely scenario is increased variability in summer rains, leading to droughts two out of every five years and major droughts every 10–20 years. Across the Sahel as a whole, droughts in the 1960s and 1970s led to an estimated 100,000 deaths. In the 1960s, the population of the Sahel as a whole was 25.5 million; by 2015, it is projected to be 88.0 million. As Shanahan and colleagues note, "Rapidly expanding populations in Sub-Saharan Africa depend heavily on monsoon rainfall for agriculture and power generation and are ill prepared to adapt to such a severe drought if [one] occurred today."²¹

The already high levels of malnutrition are likely to increase, and even without large-scale starvation, the death rate—especially among infants—is likely to rise. The social networks provided by extended families and other close kin that currently protect families against external shocks will likely collapse under the growing number of people slipping from chronic poverty (having to borrow money or rely on their extended families for food during certain parts of the year) into persistent poverty (depending year-round on relatives or external aid agencies for food and daily necessities). In this scenario, more and more food aid will be needed from the international community; however, with the rising cost of grain and competition for food from emerging economies (for farm animals as well as people), external food supplies may be depleted.

As the population of agriculturalists and pastoralists grows, and as the land becomes increasingly overused, millions will migrate to urban slums. Many may move south, crossing political, but not cultural, borders to enter northern Nigeria and other parts of West Africa, straining the food supply and economies of those regions. Rapid population growth and diminishing resources are likely to

increase the risk of conflict. A study that used regression analyses on past temperature changes to project future climate change predicted “a roughly 54% increase in armed conflict incidence by 2030 across the whole of Sub-Saharan Africa.”²²

It is difficult to escape the conclusion that across the whole of the Sahel, and in Niger specifically, the toll of rapid population growth on life and well-being will be substantial. Whether it is an infant weakened by malnutrition and dying from a respiratory infection, an adult who was stunted as a child and never achieved his or her potential, or a violent conflict over resources, the common path will lead back to overpopulation and the environmental degradation it causes.

POLICY OPTIONS

Two primary and somewhat contradictory policy options exist for slowing rapid population growth (Table 2, page 98). One is to emphasize socioeconomic improvement, which many assume will lead to lower fertility. The other is to give much greater weight to fertility regulation.

Socioeconomic Improvement

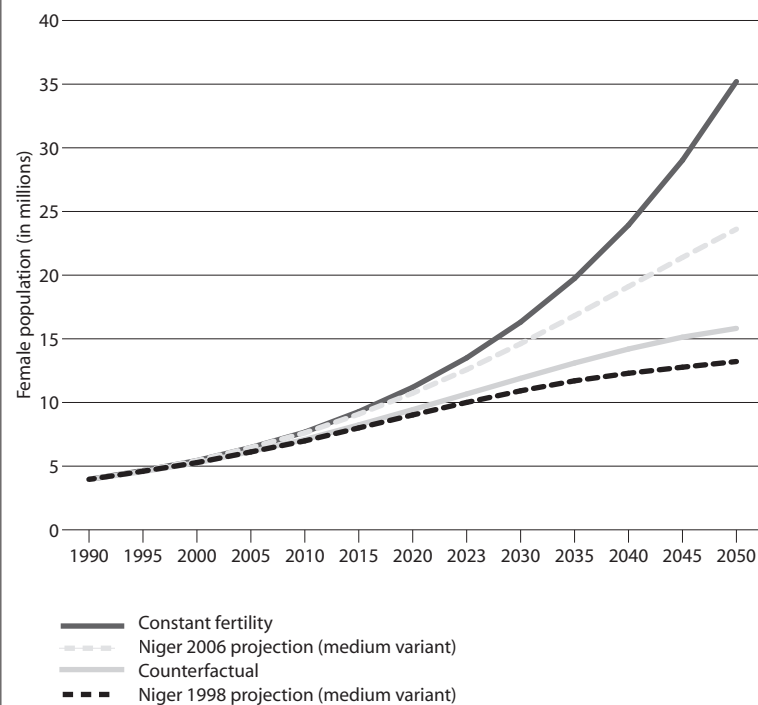
Economists in the World Bank and elsewhere continue to believe that development is the primary driver of fertility transition and often give only token support to investment in family planning. Until recently, this has been the mindset in Niger; as a result, the country has built up a great deal of demographic momentum (Figure 2).

The socioeconomic improvement option can be subdivided into a “market solution” policy and a “limited investment” policy.

- **Market solution.** Pritchett asserts that high fertility primarily reflects desired family size, and that because the cost of family planning is always lower than the cost of having and raising a child, couples should be able to achieve their fertility targets without significant external inputs.²³ We suggest that the logic behind this policy is flawed. A free market in fertility regulation has never existed in Niger because the population lacks the resources to participate in it,²⁴ contraceptive options are not widely available, abortion is illegal and most people do not have sufficient information to make informed choices. In short, for most Nigerien women, Pritchett’s model does not fit, because family planning is not a realistic option for them.

- **Limited investment.** Niger’s recent policy changes making contraceptives free of charge and widening channels of distribution have given a small boost to contraceptive prevalence;²⁵ however, there is still a long way to go. The country’s International Planned Parenthood Federation affiliate—the *Association Nigérienne pour le Bien Être Familial* (ANBEF)—includes among its initiatives services for male and female infertility, and for training young people in income-generating activities, as well as HIV prevention services, even though, unlike many African nations, HIV prevalence in Niger is less than one percent.²⁶ Given the demographic problems facing Niger, however, it seems

FIGURE 2. Alternative population projections for women in Niger based on four fertility scenarios



Notes: Projections were made using Leslie matrix projection methods, and incorporate observed mortality changes between 1990 and 2010, but assume constant mortality after 2010. World Health Organization life tables corresponding to the years 1990, 2000, and 2009 were used to project the population for the periods 1990–2000, 2000–2010 and 2010–2050, respectively. These projections do not take into account possible improvements in mortality after 2010 and thus underestimate the potential for population growth. Source: World Health Organization, Life tables for WHO member states, no date, <http://www.who.int/healthinfo/statistics/mortality_life_tables/en/>, accessed June 1, 2011.

curious that ANBEF omits from its initiatives any mention of “population,” “family planning” or “contraception.”

A “limited investment” policy gives the greatest weight to socioeconomic factors in the transition to smaller families, but may also include a small investment in family planning as an equity issue—not to ameliorate the adverse impact of rapid population growth in a country such as Niger, for example. As expressed by Hodgson and Watkins,²⁷ this policy explicitly excludes any concern with slowing rapid population growth: “Family planning services should be provided within the context of comprehensive reproductive health programs that [have] enhancing health, not lowering fertility, as their fundamental objective.”

Emphasis on Family Planning

A policy emphasizing family planning in no way denies the importance of investing in human capital, enhancing health, reducing poverty and improving the status of women, but it asserts that these investments alone will not reduce rapid population growth in the foreseeable future. Such a policy also maintains that a vigorous, strategic emphasis on fertility regulation is necessary, but not sufficient, for socioeconomic development.

Policies emphasizing fertility regulation can be subdivided into two categories. One focuses on meeting the unmet need for family planning and stresses that access to contra-

TABLE 1. Selected population characteristics, by Demographic Health Survey year, Niger

Characteristic	1959/60	1988	1992	1998	2006	2009
Population (in millions)	2.9	7.3	na	10.0	12.9	15.9
Birthrate	50–55	52	49.7	51.7	45.8	52.0
Death rate	27	20	na	na	na	17
Life expectancy from birth (in yrs.)	37	47	na	47.5	56.5	48
Infant mortality rate	200–250	138–158	na	118	148	108
Total fertility rate						
Nationwide	6.1	7.1	7.4	7.5	7.1	7.4
Rural	na	na	7.5	na	7.4	na
Women's desired family size	na	na	8.2	8.2	8.8	na
Contraceptive prevalence						
All methods	na	na	4.4	7.6	10	11
Modern methods	na	na	2.3	4.4	4.5	5
Rural	na	na	2.5	na	3	na
Median duration of lactation (in mos.)	na	na	20.9	na	21.3	na
Age at first birth*	na	na	17.7	na	17.9	na
Age at marriage						
Males	na	na	na	na	23.1	na
Females	na	na	15.1	na	15.5	na
% polygamous males aged 40	na	na	24	na	25	na
Median age of population	15.5	15.9	15.9	16.2	16.0	na
% rural	95	85	na	80	na	80
Maternal mortality ratio†	na	na	671	590	648	820

*Among females 20–24. †Maternal deaths per 100,000 live births. Note: na=not applicable. Sources: reference 11. **Population, infant mortality rate and maternal mortality ratio**—1998: World Bank, *World Development Report 2000/2001: Attacking Poverty*, New York: Oxford University Press, 2001. **Women's desired family size**—1998 and 2006: Measure DHS, Demographic and Health Surveys Database, <<http://www.measuredhs.com/accesssurveys/>>. **Maternal mortality ratio**—2009: World Health Organization (WHO), *Trends in Maternal Mortality: 1990 to 2008*, Geneva: WHO, 2010.

ception and safe abortion can lower family size, even in illiterate and impoverished communities.²⁸ The other recognizes that although such policies alone can probably reduce family size in many communities, Niger and other parts of the Sahel have the added problem of early marriage.

• **Access to family planning.** Providing a variety of contraceptive methods to women who want to delay or end childbearing and countering misinformation about contraception constitute a logical and necessary starting point for fertility reduction. Although the stated demand for family planning in Niger is low, only 42% of that demand is satisfied.² Furthermore, desired family size is a moving target. For example, when the rapid fertility decline in Iran began in 1990, the TFR was 5.5 and women did not report

ideally wanting a two-child family; that desired family size was not achieved until 10 years later.²⁹

Forty years of organized family planning programs in Asia and Latin America provide compelling evidence that investment in making contraception available and removal of unjustified barriers to family planning, along with provision of correct information, can lower birthrates.^{30–33} In turn, slowing population growth accelerates development: The World Bank calculates for Niger's neighbor, Burkina Faso, that if its population in 2050 is the lower UN variant projection rather than the higher variant projection, then its per capita household consumption will be 24% higher.³⁴

The cost of making family planning accessible in Niger is modest in relation to other aspects of development. When converted into 2007 U.S. dollars, the average annual cost of family planning ranges from \$6.10 to \$34.59 per couple.³⁵ On the basis of these costs, if the projected number of women aged 15–49 in 2010 is roughly 3.3 million and intensive efforts are made to increase the contraceptive prevalence to 30% (tripling current rates), the estimated cost of family planning would range from \$4.1 million dollars to \$23.3 million dollars per year. Given the rapid growth in the number of fertile women, these costs will increase over time. Simply doubling contraceptive prevalence might cost anywhere between \$2.1 million and \$11.6 million. The cost of the commodities themselves is relatively stable, but the methods of distribution and delivery (through social marketing, community organizations, clinics, or clinics with community-based distribution) contribute significant variability, and there are large-scale family planning efforts in low-resource settings that have been undertaken for less, such as in Bihar, India.³⁶

After decades of inaction, however, even a policy that merely emphasizes making family planning widely available in Niger faces serious challenges. The lack of health infrastructure and the extreme shortages of health personnel at all levels limit the range of contraceptive options that can be offered. Therefore, for some time to come, more births will likely be averted by traditional methods than by modern methods. Lactational amenorrhea is one such traditional method; thus, it is imperative to avoid any promotion of artificial feeding. In addition, *azl* (withdrawal), which is endorsed in the Koran, has proved a demographically important choice in countries such as Turkey.

Condoms and oral contraceptives, however, should be as widely available as possible. Community volunteers should be trained to distribute these methods,³⁷ and women should be given a minimum of three pill packs at a time. Additionally, community-based health workers and community volunteers could be trained to dispense injectables safely in Niger, as they have in other developing countries.^{38,39} Given the tradition of conservatism and overmedicalization in many francophone countries, including Niger, establishing such policies may at first be controversial; however, unless they are accepted, Niger is unlikely to begin to achieve contraceptive prevalence high

TABLE 2. Policy Approaches for Niger

Policy option	Rationale
Socioeconomic improvement	
Market solution ²³	Fertility rates are a reflection of couples' choice and no change in policy is needed.
Limited investment ²⁷	By focusing on improving overall health and socioeconomic status, fertility rates will decrease.
Fertility regulation	
Access to family planning ²⁸	Dedicated programming to improve access to contraception and safe abortion will decrease fertility rates and are one prerequisite for socioeconomic development in a high-fertility society.
Access to family planning plus raise the age of marriage ²⁸	In a polygamous society with a low age at marriage, policies to raise the age at marriage are needed to complement access to family planning.

enough to reduce population growth.

The use of long-term methods, such as IUDs, will be limited by the small number of health professionals who can be trained in their insertion. In Niger, only 0.2% of women with five children or more have accepted voluntary sterilization, and even if demand for sterilization rises, growth in its use will be limited by shortages of surgeons and operating facilities.⁸ Provision of voluntary, nonsurgical sterilization should be monitored,³⁷ and decisions should be made regarding its larger-scale use as more evidence becomes available.

Access to family planning includes the availability of accurate, culturally appropriate knowledge. Many poor, illiterate women believe that contraception is more dangerous than childbirth,⁴⁰ although the risk of death associated with childbirth is actually much higher. Reaching women and couples with accurate information, however, presents a challenge. The use of radio and TV to disseminate correct information about family planning and correct misinformation about contraception needs to be greatly expanded. Sixty-five percent of women in the capital, Niamey, watch television, but only 2% of rural women do; however, the radio is accessible to 35% of rural women.⁸

Where knowledge of and access to contraceptives is limited, unintended pregnancies will be common, and some proportion of women will seek to end them through abortion. However, abortion is illegal in Niger, and there have been no surveys of unsafe abortion practices there. There are limited data on Muslim communities in Nigeria, where one in six women report having had an unwanted pregnancy, and almost half of all women with an unwanted pregnancy say they tried to terminate the pregnancy, most commonly to stop or space childbearing.⁴¹ In Burkina Faso, despite the stigma attached to induced abortion, there are 40 abortions per 1,000 women per year, largely concentrated among young, unmarried women.⁴² West Africa as a whole has the highest abortion-related mortality (140 per 100,000 live births per year) of any part of the world.⁶ In Ethiopia, access to safe abortion, especially medication abortion, has rapidly reduced the burden of mortality and morbidity from unsafe abortion.⁴³

• **Increasing the age of marriage.** The early age of sexual debut of women in Niger is a key factor influencing the country's high TFR. The mean age of marriage is younger than 14 in some areas, and the high ratio of young women to older men in the population enables affluent older men to engage in polygynous marriages with teenage women.

Increasing the age of childbearing by five years in a country such as Niger would reduce future population growth by 15–20%.⁴⁴ Strategies for postponing the age of marriage are limited, but there is an increasing consensus that much more investment needs to be made in young women: Delaying marriage and childbearing increases the time between generations and slows population growth, young women's education enhances their autonomy and their power to manage childbearing, and it benefits the next generation as educated mothers invest in their own

children. Experimental mechanisms are being explored for creating physically and psychologically "safe spaces" where young women can learn about their bodies and ways of limiting family size. Pilot projects in Hausa communities in Northern Nigeria have found that small cash payments can give parents an incentive to keep their daughters in school.⁴⁵

CONCLUSIONS

An objective examination of the current situation in Niger and of its foreseeable demographic changes makes a focused, initially stand-alone family planning program a critically important policy strategy—likely the only one that is achievable. Efforts to increase the age of marriage should be undertaken, but will likely not have substantial results in the immediate future.

The International Conference on Population and Development (ICPD) in 1994 was explicit about the need to bear in mind "the crucial contribution that early stabilization of the world population would make towards the achievement of sustainable development."⁴⁶ Unfortunately, some groups framed the ICPD message in a way that equated family planning programs with coercion. As Joan Dunlop, an important leader in reinterpreting family planning policies after the ICPD said, "What we wanted to do was...redirect the money."⁴⁷ This strategy undermined support for focused family planning programs and failed to help women because it lacked any sense of scale. In 1995, support for international family planning accounted for only 0.5% of development assistance from countries belonging to the Organization for Economic Co-operation and Development;⁴⁸ today, that proportion is even lower (0.2%). The policy that grew out of ICPD diverted attention from contraception and drained family planning budgets, leading to stalled fertility decline in many parts of Africa.⁴⁹ For Niger, the failure to emphasize family planning since 1994 has transformed a serious demographic scenario into a potentially catastrophic one.

Population growth at the pace found in high-fertility African countries like Niger undermines any plausible strategy to lift people out of poverty through economic development. If education fails to catch up with demographic growth, then there is no possibility of educating ever-increasing numbers of young people. Finally, even if education could be expanded significantly, it would take a generation to affect population growth, as there is a long delay between the beginning of education and a woman's maximum fertility. By contrast, improved access to contraception can have an impact within a very short period of time. The adoption of family planning can prevent infant and maternal deaths,⁵⁰ even before any improvements are made in clinical services.

Niger and other countries in the Sahel must live with past mistakes, but appropriately designed family planning programs could reduce the long-term impact of those mistakes. Although some demographers have urged that family planning be provided only in "the context of compre-

hensive reproductive health programs,”²⁷ such projects would require unachievably large budgets and an unacceptably long time frame. Instead, we argue that stand-alone family planning services should be the first element of primary health care implemented in such resource-poor settings as Niger.

If Niger is to take any significant steps toward achieving the third Millennium Development Goal of promoting gender equality and empowering women, then in the words of WHO, “Although women’s ability to control their fertility is by itself not sufficient to gaining their full empowerment and gender equality, it is the first and most important step.”⁵¹

The 2007 *Declaration du Gouvernement en Matière de Politique de Population* policy begins to recognize the difficult problems that continued rapid population growth poses. It encourages modestly increased budgets for family planning, but much more needs to be done. Improvements in forecasting contraceptive needs and improving logistics are essential, since contraceptive stockouts are common in many parts of Africa. More effort to keep girls in school is also urgently needed. The ICPD Programme of Action calls on “all countries [to] seek to identify and remove all the major remaining barriers to the utilization of family planning services.”⁴⁶ This goal is still a long way from being fulfilled. In addition, efforts are needed to confront the adverse public health impact of unsafe abortion, by improving access to postabortion care, using misoprostol to treat incomplete abortions and ensuring that every woman who is treated for an unsafe abortion receives appropriate contraceptive advice.

Unfortunately, the demographic momentum now found in Niger casts a threatening shadow over a number of high-fertility countries and regions. An objective review of possible scenarios for the Sahel as a whole suggests that a humanitarian catastrophe may unfold over the next 30 years. It is imperative that local governments, international agencies and donors, and anyone with a commitment to lifting people out of poverty and improving the health of women and children join in a vigorous effort to take the best practices from earlier family planning programs and apply those practices to launching large-scale voluntary family planning in Niger and other suffering countries across the Sahel.

Since ICPD, much justified criticism has been directed at coercive family planning practices. We argue that “coercive pregnancy,” in the sense of failing to ensure that Nigerien women have the information about and access to family planning needed to choose when to have a child, is as ethically deplorable and unacceptable.

REFERENCES

1. Population Reference Bureau (PRB), *2010 World Population Data Sheet*, Washington, DC: PRB, 2010.
2. PRB, *Niger Summary*, 2009, <www.prb.org/datafinder/geography/summary.aspx?region=28®ion_type=2>, accessed Sept. 8, 2009.
3. United Nations (UN), *Niger: Projections Démographiques des Nations*

Unies, Révision de 2002, New York: UNDP, 2002.

4. UN, *World Population Prospects: The 2006 Revision*, New York: UN, 2007, pp. 362–363.
5. UN, *World Population to 2300*, New York: UN, 2004.
6. Cleland J, Ndugwa R and Zulu E, Family planning in Sub-Saharan Africa: progress or stagnation? *Bulletin of the World Health Organization*, 2011, 89(2):137–143.
7. UN, *World Population Prospects, The 2006 Revision, Vol. 1: Comprehensive Tables*, New York: UN, 2007.
8. Institut National de la Statistique (INS) Niger and Macro International, *Niger: Enquête Démographique et de Santé et à Indicateurs Multiples*, Calverton, MD, USA: INS and Macro International, 2007.
9. UN Development Programme, *Human Development Indices: A Statistical Update 2008–HDI Rankings*, <<http://hdr.undp.org/en/statistics/>>, accessed Sept. 20, 2009.
10. World Bank, *Key Development Data and Statistics; Country Profile: Niger*, <http://ddp-ext.worldbank.org/ext/ddpreports/ViewSharedReport?CF=1&REPORT_ID=9147&REQUEST_TYPE=VIEWADVANCED&HF=N&WSP=N>, accessed Sept. 20, 2009.
11. World Bank, *Niger: Providing All Nigeriens with Food, Education and Health Care, a Demographic Perspective*, Washington, DC: World Bank, 2005.
12. World Health Organization (WHO), *World Health Report 2004, Annexes by Country*, Geneva: WHO, 2004.
13. WHO, *World Health Statistics, 2009*, Geneva: WHO, 2009.
14. Mendelsohn R, Dinar A and Dafelt A, *Climate Change Impacts on African Agriculture*, Pretoria, South Africa: Center for Environmental Economics and Policy in Africa, July 2000, <http://www.ceepa.co.za/Climate_Change/pdf/%285-22-01%29afrbckgrnd-impact.pdf>, accessed Dec. 17, 2010.
15. Baidu-Foson J and Napier TL, Wind erosion within Niger, *Journal of Soil and Water Conservation*, 1998, 53(2):120–125.
16. Republic of Niger, *Bilan Diagnostic des Actions et Perspectives dans le Domaine de la Population, de l’Environnement et de la Sécurité Alimentaire au Niger*, Niamey, Niger: Bureau de Réalisation Technique d’Étude et de Conseil, 1999.
17. Hirsch A, *Struggling to Afford to Eat in Niger*, <http://news.bbc.co.uk/2/hi/programmes/from_our_own_correspondent/8929517.stm>, accessed Feb. 15, 2011.
18. World Food Programme, *Niger Country Profile*, 2010, <<http://www.wfp.org/countries/niger>>, accessed Feb. 25, 2011.
19. UN Economic Commission for Africa, *Climate Change Through the Lens of Vulnerability and Human Rights*, presented at the Seventh African Development Forum (ADF VII) Pre-Event, Addis Ababa, Ethiopia, Oct. 11–12, 2010.
20. Kandji ST, Verchot L and Mackensen J, *Climate Change and Variability in the Sahel Region: Impacts and Adaptation Strategies in the Agricultural Sector*, Nairobi, Kenya: World Agroforestry Center and UN Environment Programme, 2006.
21. Shanahan T et al., Atlantic forcing persistent drought in West Africa, *Science*, 2009, 324(5925):377–380.
22. Burke M et al., Warming increases the risk of civil war in Africa, *Proceedings of the National Academy of Sciences*, 2009, 106(49):20670–20674.
23. Pritchett LH, Desired fertility and the impact of population policies, *Population and Development Review*, 1994, 20(1):1–56.
24. Sen A, *Development Is Freedom*, New York: Alfred A. Knopf, 1999.
25. Government of Niger, *54 Déclaration de Gouvernement en Matière de Politique de Population*, Niamey, Niger, 2007.
26. Global Hand, *Association Nigérienne pour le Bien-Etre Familial*, <<http://www.globalhand.org/data/organisation.2008-09-21.0848302069>>, accessed Sept. 12, 2009.
27. Hodgson D and Watkins SC, Feminists and Neo-Malthusians: past and present alliances, *Population and Development Review*, 1997,

23(3):469–523.

28. Potts M, Pebley AM and Speidel J, Editorial, *Philosophical Transactions of the Royal Society B: Biological Sciences*, 2009, 364(1532): 2975–2976.

29. Roudi-Fahimi F, Iran's family planning program: responding to a nation's needs, *MENA Policy Brief*, Washington, DC: PRB, 2002.

30. Prata N, Making family planning accessible in resource-poor settings, *Philosophical Transactions of the Royal Society B: Biological Sciences*, 2009, 364(1532):3093–3099.

31. Cleland J, *A Job Half-Done: Family Planning in the 21st Century*, Washington, DC: Wilson Center, 2007.

32. Potts M, Sex and the birth rate: human biology, demographic change, and access to fertility-regulation methods, *Population and Development Review*, 1997, 23(1):1–39.

33. Campbell M, Prata N and Potts M, The impact of freedom on fertility transition, paper presented at the 26th International Union for the Scientific Study of Population International Population Conference, Marrakech, Morocco, Sept. 27–Oct. 2, 2009.

34. World Bank, *Burkina Faso, Promoting Growth, Competitiveness and Diversification, Vol. III: Enhancing Growth Factors*, Geneva: World Bank, 2009, pp. 8–24.

35. Levine R et al., Contraception, in: Jamison DT et al., eds., *Disease Control Priorities in Developing Countries*, second ed., Washington, DC: World Bank; and New York: Oxford University Press, 2006.

36. Janani, Janani Progress Report, <<http://www.cpc.unc.edu/projects/abm/programs/janani.html>>, accessed Oct. 31, 2009.

37. de Magalhaes DR et al., Quinacrine sterilization for human immunodeficiency virus-positive women, *Fertility and Sterility*, 2009, 92(1):108–115.

38. Stang A, Schwingl P and Rivera R, New contraceptive eligibility checklists for provision of combined oral contraceptives and depot-medroxyprogesterone acetate in community-based programs, *Bulletin of the World Health Organization*, 2000, 78(8):1015–1023.

39. Rai C et al., Conditions in rural Nepal for which depot-medroxyprogesterone acetate initiation is not recommended: implications for community based service delivery, *Contraception*, 1999, 60(1):31–37.

40. Campbell M, Sahin-Hodoglugil NN and Potts M, Barriers to fertility regulation: a review of the literature, *Studies in Family Planning*, 2006, 37(2):87–98.

41. Sedgh G et al., Unwanted pregnancy and associated factors among

Nigerian women, *International Family Planning Perspectives*, 2006, 32(4):175–184.

42. Rossier C et al., Estimating clandestine abortion with the confidants method—results from Ouagadougou, Burkina Faso, *Social Science & Medicine*, 2006, 62(1):254–266.

43. Gebrehiwot Y and Liabsuetrakul T, Trends of abortion complications in a transition of abortion law revision in Ethiopia, *Journal of Public Health*, 2009, 31(1):81–87.

44. Bruce J and Bongaarts J, The new population challenge, in: Mazur L, ed., *A Pivotal Moment: Population, Justice and the Environmental Challenge*, Washington DC: Island Press, 2009, pp. 260–275.

45. Perlman D, University of California, Berkeley, USA, personal communication, Apr. 2011.

46. UN, *Programme of Action Adopted at the International Conference on Population and Development, Cairo, Sept. 5–13, 1994*, New York: Department for Economic and Social Information and Policy Analysis, UN, 1995.

47. Goldberg M, *The Means of Reproduction: Sex, Power, and the Future of the World*, New York: Penguin Press, 2009.

48. Organization for Economic Co-operation and Development (OECD), *Credit Reporting System Database*, no date, <http://www.oecd.org/document/0/0,2340,en_2649_34447_37679488_1_1_1_1,00.html>, accessed Feb. 8, 2011.

49. Ezeh AC, Mberu BU and Emina JO, Stall in fertility decline in Eastern African countries: regional analysis of patterns, determinants and implications, *Philosophical Transactions of the Royal Society: Biological Sciences B: Biological Sciences*, 2009, 364(1532):2991–3007.

50. Prata N et al., Saving maternal lives in resource-poor settings: facing reality, *Health Policy*, 2009, 89(2):131–148.

51. All Party Parliamentary Group on Population, Development and Reproductive Health (APPG PD&RH), *Return of the Population Growth Factor: Its Impact upon the Millennium Development Goals*, London: APPG PD&RH, 2007, p. 32.

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