FOSTERING ECONOMIC GROWTH, EQUITY, AND RESILIENCE IN SUB-SAHARAN AFRICA: THE ROLE OF FAMILY PLANNING

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FOSTERING ECONOMIC GROWTH, EQUITY, AND RESILIENCE IN SUB-SAHARAN AFRICA: THE ROLE OF FAMILY PLANNING

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Abbreviations and Acronyms

AFR—United States Agency for International Development Bureau for Africa

CO2—Carbon Dioxide

COP—Conference of the Parties

DemDiv—Demographic Dividend

DHS—Demographic and Health Surveys

DRC—Democratic Republic of the Congo

ENGAGE—Eliminating National Gaps–Advancing Global Equity

FP2020—Family Planning 2020

GDP—Gross Domestic Product

HIV/AIDS—Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome

IMF—International Monetary Fund

IPCC—Intergovernmental Panel on Climate Change

mCPR—Modern Contraceptive Prevalence Rate

MICS—Multiple Indicator Cluster Surveys

NAPA—National Adaptation Program of Action

OP—Ouagadougou Partnership

RAPID—Resources for the Awareness of Population Impacts on Development

RH—Reproductive Health

SDGs—Sustainable Development Goals

SSA—Sub-Saharan Africa

TDR—Total Dependency Ratio

TFR—Total Fertility Rate

UK—United Kingdom

UN—United Nations

UNDP—United Nations Development Program

UNICEF—United Nations International Children's Emergency Fund

USAID—United States Agency for International Development

WHO—World Health Organization

"Sub-Saharan Africa could reap significant benefits from its growing population—if the transition is well managed...Put simply, the region will be the world's key demographic player this century."

Thakoor and Wakeman-Linn, 2015

Between 2015 and 2100...*

- Sub-Saharan Africa's population will quadruple **from 960 million to 4 billion**.
- Sub-Saharan Africa's share of the global population will increase from an estimated **13 percent to about 35 percent**.
- Sub-Saharan Africa will account for almost **100 percent of the world's estimated 2 billion** increase in workforce this century.
- Nigeria's population is projected to grow from **182 million in 2015 to 752 million by 2100**.
- 11 other Sub-Saharan countries expect **populations over 100 million** by the end of the century.

Improving family planning services today could make this transition easier...

*Vimal Thakoor and John Wakeman-Linn, "Surf the Demographic Wave," *Finance & Development* 53, no. 1 (2016), accessed at www.imf.org/external/pubs/ft/fandd/2016/03/thakoor.htm, on Sept. 9, 2016. [This article is based on Chapter 2 of the April 2015 IMF Regional Economic Outlook: Sub-Saharan Africa, "How Can Sub-Saharan Africa Harness the Demographic Dividend?"]; United Nations, *World Population Prospects: The 2015 Revisions.*

SUMMARY

Sub-Saharan Africa (SSA) is undergoing major transformations. In the last decade, the region has experienced strong economic growth, reduced maternal and infant deaths, increased levels of education, and new advances in technologies and telecommunications—creating the conditions for a robust future. However, recent economic growth rates have slowed, underscoring the need for new strategies. Persistent high rates of population growth threaten to undermine future economic growth as well as other social and development advancements. In addition, more than 335 million people live in poverty and many are left out of the progress. The great challenges leaders face are how to cope with growing populations, reduce poverty and inequity, build the resilience of those most vulnerable, be competitive in today's global economy, and improve people's lives without compromising the environment or the well-being of future generations.

Tackling these challenges requires cross-sectoral collaboration, innovative approaches, and making the most of all available interventions. Family planning is one intervention that could and should be further leveraged. This review examines the critical role of voluntary family planning in Africa's future. It provides an overview of the status of family planning over the last five years, and explores family planning's tremendous potential to make a difference in many of the social and economic obstacles facing SSA today. Below are key findings:

- **More African countries are experiencing healthy increases in modern contraceptive use.** Over the period 2010 to 2015, the number of countries where the modern contraceptive prevalence rate (mCPR) increased by an average of more than one percentage point per year more than doubled—from four to 10 countries—compared to the previous decade.

- **Higher rates of modern contraceptive use did not always translate into rapid fertility decline.** While modern contraceptive use has taken off in a growing number of countries, fertility has declined more slowly or stagnated. Family planning is part of a complex constellation of factors that affect fertility. However, research indicates that where governments make family planning a priority and support effective programs, fertility declines more rapidly.

- **Greater emphasis is needed on broader method choice.** Part of the reason for slow fertility decline may lie in the contraceptive method mix. Many countries have relied heavily on short-acting and, in some cases, traditional methods. More effective long-acting reversible and permanent methods are experiencing growing popularity in African settings—where they are available and properly supported—suggesting that they are a critical part of the response to reducing fertility in the region. Expanding access to these more effective methods will require considerable resources for their widespread use.

- **Family planning's role in reducing fertility and changing demographic structures could help:**

    - **Accelerate Sub-Saharan Africa's economic growth and global competitiveness.** Historical trends in Asia indicate that declines in fertility preceded or were associated with a faster rate of economic growth. As fertility declines and the share of the population of working age increases, more African countries are approaching the dependency-ratio pivot point of 50 (100 workers to 50 dependents) associated with increases in savings and investments as well as improvements in health, nutrition, and education. Yet, without accelerated fertility decline, most African countries will not reach the dependency-ratio pivot point—and the benefits associated with it—for decades to come.

    - **Reduce unemployment and underemployment.** A large working age population and favorable dependency ratio can propel economic growth provided there are sufficient jobs. Projections show that by 2050, Uganda will have more than triple the number of workers compared to today—from 19 million to 61 million—and Niger's workforce will quadruple (from 9 million to 39 million) in the same period. Family

planning helps countries free up resources to make the infrastructure investments needed to produce high-quality productive jobs, while reducing the number of future workers entering the job market. However, to reduce tomorrow's unemployment and underemployment, family planning programs have to be strengthened and expanded today.

- **Position African countries to benefit from the technology revolution.** Mobile technology is transforming the lives of Africans. The global technology revolution is already changing demand for labor and the nature of employment, especially in African cities. Reducing fertility gives countries the breathing room to invest in education and workforce development—human capital—and in the technology infrastructure to equip them to better meet the changing demands of the 21st century.

- **Foster stronger national institutions.** Reduced fertility translates into more stable population growth rates, eased pressures on the job market, fewer unemployed youth, and as a consequence, an environment more conducive to cultivating strong democracies. Shifts in age structure from a youthful population to a more mature one helps lay the foundation for social and political stability—a cornerstone of robust national institutions.

- **Past differentials in fertility between the rich and the poor have exacerbated inequities in access to economic opportunities.** Inclusive family planning and development programs can help close the fertility gap between the rich and the poor. The primary African example is Rwanda, where the fertility and age structures of the rich and the poor are converging and approaching those of higher-income countries. In contrast, in countries like Uganda and Nigeria, fertility and age structure inequities remain large; high dependency ratios of the poorest segments of the population, coupled with low family planning program service uptake, compromise their ability to access and benefit from economic opportunities. Family planning programs need to prioritize accessibility for all.

- **Smaller families and slower population growth build resilience to natural and manmade shocks and stresses.** Family planning can help mitigate the adverse impacts of climate change, water scarcity, land degradation, and rapid urbanization in two ways: by creating smaller households, which will enhance the capacity to cope at the family level; and by reducing population pressures on land, food, and water, slowing CO2 emissions, and generating climate-related and health benefits.

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SECTION I
INTRODUCTION

Africa is on the move, positioned to emerge as a major economic driver in the world. In the past two decades, the continent has enjoyed an average annual economic growth rate of 4.5 percent.[1] Sustaining that momentum, especially in light of a recent slowdown in growth in 2016, will require concerted policy and program actions on many fronts. One intervention that could contribute to the attainment of sustained economic growth is family planning. A growing body of evidence suggests that family planning has a profound impact on many of the major determinants of economic growth, extending beyond the well-understood effect on income per capita.[2] Specifically, investments in voluntary family planning programs could help sustain or accelerate economic growth by enhancing labor productivity and efficiency, promoting equity, and strengthening resilience.

In January 2015, the United States Agency for International Development (USAID) celebrated 50 years of investment in family planning. As the largest bilateral donor in international family planning and reproductive health assistance, USAID has been a leader in transforming the global landscape of family planning. Throughout 2014-2015, USAID's Bureau for Africa (AFR) undertook a review of the progress of family planning programs in priority countries in sub-Saharan Africa (SSA). Section II of this report summarizes the findings of that review and updates an earlier report, *Family Planning Program Review in Selected Countries in Sub-Saharan Africa*, published by the USAID Bureau for Africa, Office of Sustainable Development, in 2010. It focuses on 21 countries in SSA, representing about three-quarters (78

BOX 1

Methods, Population Projections, and Fertility Variants

This report draws on data from primary and secondary sources including technical literature reviews, key reports published by development institutions (World Bank, United Nations, International Monetary Fund), articles authored by universities and notable scholars, USAID publications and programming documents, and data from population-based surveys such as Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS).

Unless otherwise stated, population projections throughout the report use the latest updated and harmonized data from the United Nations (UN), Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2015 Revision*. Analyses based on population projections provide several scenarios because projections are based on assumptions and are not definitive predictors of what will actually happen.

The United Nations Development Program (UNDP) provides low, medium, and high fertility variants to estimate future populations. The different projections are based on the following:

Medium Variant: The medium variant is the most likely fertility trend and assumes growth in family planning use that will result in fertility reductions resembling patterns similar to what occurred in other countries.

Low and High Variants: The low variant assumes that the total fertility rate (TFR) is one-half child *less* than the medium variant at each period in time, while the high variant assumes that the TFR is one-half child *more* than the medium variant.

percent) of the population in the region, and highlights three major developments since 2010:

- Significant advances in family planning program performance after decades of slow progress.
- Marked increases in country and donor funding for family planning after a decade of stagnation.
- Growing recognition of the linkages between family planning and economic growth, particularly as those links are demonstrated in the concept of the demographic dividend.

Section III of this report examines future demographic trends based on past performance and their impact on economic development. It presents hypotheses—to be examined further—that family planning significantly affects development in three key ways:

- **Strengthening economic growth and competitiveness.** Strong family planning programs can help countries improve health and nutritional status, enhance labor productivity, and create conditions for reducing unemployment and underemployment to strengthen national economies and country global competitiveness.
- **Advancing inclusive and equitable growth.** Strong family planning programs can help countries reduce inequalities in access to economic opportunity, creating growth that is enjoyed by a larger segment of the population including the poor.
- **Building resilience.** Strong family planning programs that move countries toward the demographic transition can help people to adapt to, prevent, and recover more quickly from shocks and stresses in a manner that reduces chronic vulnerability and also facilitates inclusive growth.[3]

SECTION II

FAMILY PLANNING PROGRAM REVIEW (2010-2015)

Country Performance and Global Support: Improving and Promising

The family planning landscape in SSA has dramatically improved over the last decade. On the basis of an annual increase in the modern contraceptive prevalence rate (mCPR) in the years between the two most recent DHS, countries are classified into those that demonstrated:

- **Rapid Progress** (*annual mCPR increase of more than 2 percentage points and/or mCPR of ≥ 40 percent*): Ethiopia, Kenya, Madagascar, Malawi, Rwanda, Senegal, and Zambia.
- **Encouraging Progress** (*annual mCPR increase of more than 1 and ≤ 2 percentage points*): Liberia, Niger, and Uganda.
- **Slow Progress** (*annual mCPR increase of ≥ 0.5 and ≤ 1.0 percentage point*): Burkina Faso, Ghana, Mali, Tanzania, and Togo.
- **Little or No Progress** (*annual mCPR increase of < 0.5 percentage points*): Benin, Democratic Republic of Congo (DRC), Côte d'Ivoire, Guinea, Mozambique, and Nigeria.

In 2010, at the time of the last family planning review, only four countries of those reviewed had attained average annual increases in mCPR of more than 1 percent for the years between their last two national DHS surveys. In 2015, 10 countries had achieved annual increases of more than 1 percent (Encouraging plus Rapid Progress), and five of those countries are achieving annual increases of more than 2 percent (Rapid Progress; see Table 1). Two countries, Malawi and Ethiopia, are making remarkable strides with annual increases of 2.9 and 4.4 percent, respectively. Rwanda and Zambia are included in the Rapid Progress category based on past performance

TABLE 1

Average Annual Percentage Point Increase of Modern Contraceptive Uptake in 21 Sub-Saharan Africa Countries by Performance Categories

Progress Categories and Countries	mCPR Average Annual Percentage Point Increase Between Last Two Surveys
Rapid Progress (annual increase > 2 percent and/or mCPR ≥ 40%)	
Ethiopia (2011/2014)*	4.4
Kenya (2008-2009/2014)+	2.5
Madagascar (2003-2004/2008-2009)	2.2
Malawi (2010/2015-2016)*+	2.9
Rwanda (2010/2014-2015)*+	0.5
Senegal (2010-2011/2013-2014)**	2.7
Zambia (2007/2013-2014)+	1.9
Encouraging Progress (annual increase >1 & ≤ 2 percent)	
Liberia (2007/2013)	1.5
Niger (2006/2012)	1.2
Uganda (2006/2011)	1.6
Slow Progress (annual increase ≥ 0.5 & ≤ 1)	
Burkina Faso (2003/2010)	0.9
Ghana (2008/2014)	0.9
Mali (2006/2012-2013)	0.5
Tanzania (2010/2015-2016)*	0.8
Togo (1998/2013-2014)	0.7
No Progress (annual increase < 0.5)	
Benin (2006/2011-2012)	0.3
Congo, Democratic Republic (2007/2013-2014)	0.3
Côte d'Ivoire (1998-1999/2011-2012)	0.4
Guinea (2005/2012)	-0.2
Mozambique (2003/2011)	-1.2
Nigeria (2008/2013)	0

*Preliminary DHS results | **Continuous DHS survey
+Indicates mCPR > 40% in most recent survey

(> 2 percent annual increase in the 2005 to 2010 period) and current mCPRs of 48 percent and 45 percent respectively. Both countries have experienced a slowdown in annual increase over the last five years, largely due to having achieved a high level of mCPR, making it more challenging to continue rapid increases in mCPR because it now means capturing new clients in harder-to-reach rural and periurban areas.

Furthermore, the use of modern contraceptives is going up (see Figure 1). At the time of the previous survey:

- Only five countries had mCPRs of 20 percent or more.
- Four countries had mCPRs greater than 30 percent.
- One country had a mCPR greater than 40 percent.

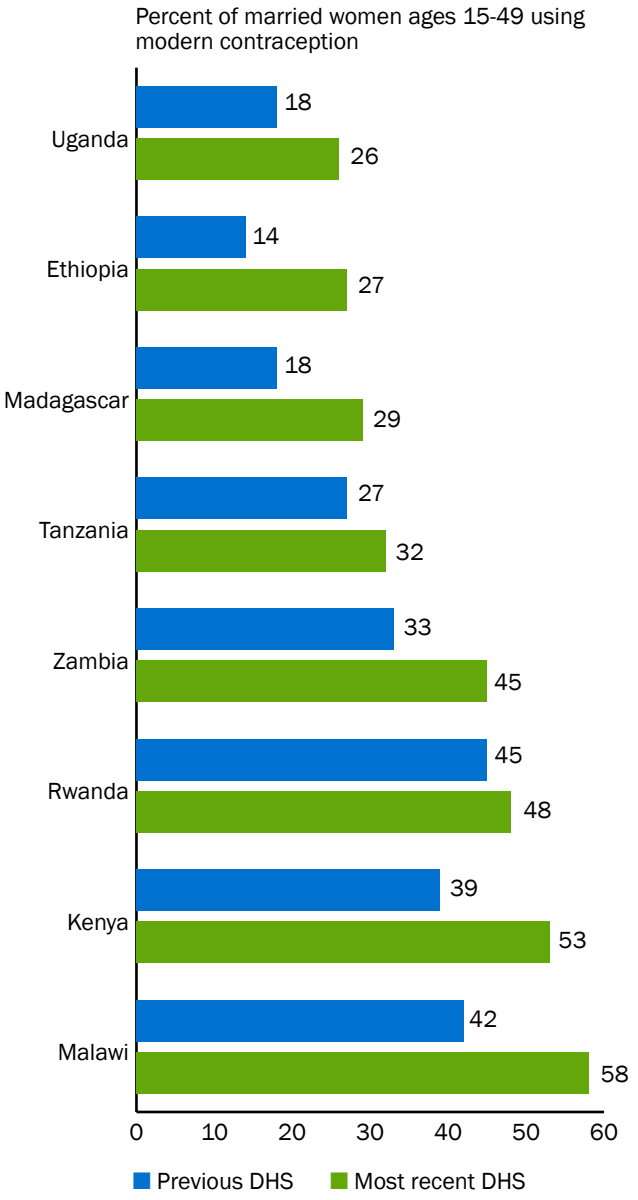
In 2015, according to the most recent surveys:

- Eight countries have mCPRs over 20 percent.
- Four countries have reached more than 40 percent.
- Two countries—Rwanda and Kenya—have an estimated half of married women 15 to 49 using modern methods of contraception, and Malawi's mCPR has recently risen to an impressive 58 percent.

Higher rates of modern contraceptive use, however, do not automatically translate into lower levels of fertility. Research indicates that modern contraceptive use and effectiveness are among the top four determinants of fertility decline, but sufficient services must be in place to fully benefit from mCPR's contribution to the decline.[4,5,6] For example, family planning programs need to provide a consistent supply of the full range of contraceptives as well as appropriate counseling services to ensure that clients' needs are met across their reproductive lives.

FIGURE 1

Trends in Modern Contraceptive Prevalence Rates (mCPRs) for Countries With Recent mCPRs of More Than 20 Percent



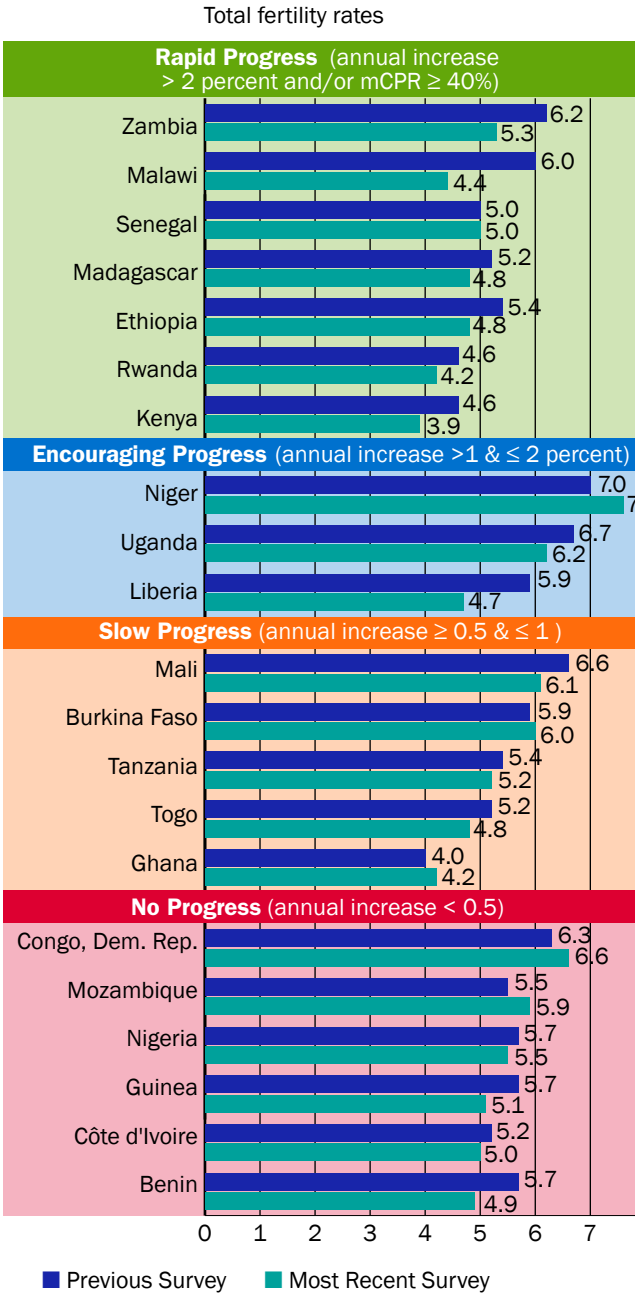
Source: ICF International, Demographic and Health Surveys.

Figure 2 presents trends in total fertility rates (TFR)—the average number of children per woman—in the 21 countries by category of mCPR percent annual increase (Rapid Progress, Encouraging Progress, Slow Progress, and No Progress). TFRs in the Rapid Progress (green) countries are overall lower than in the other categories, and for the most part, are going down. While there has been notable progress in reducing TFR in the remaining three categories of countries, five countries remain at 6.0 children per woman or higher: Niger, Uganda, Mali, Burkina Faso, and DRC.

© Karel Noppé / Alamy Stock Photo

FIGURE 2

Country Progress in Modern Contraceptive Uptake Does not Always Translate Into Lower Fertility Rates



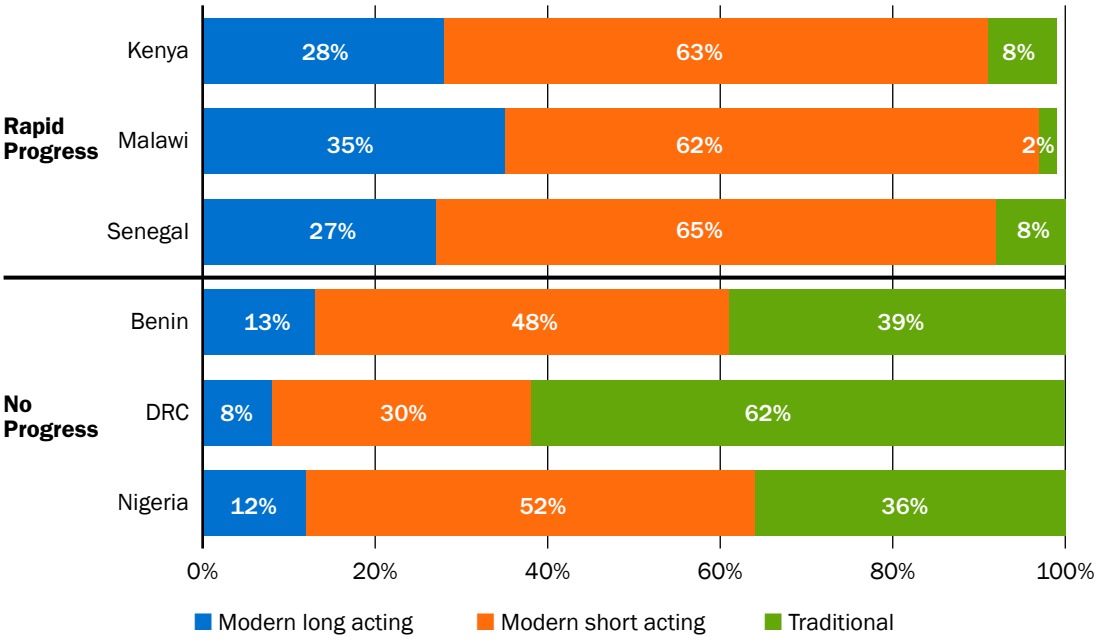
Source: ICF International, Demographic and Health Surveys.

Two of Africa's most populous, high-fertility countries (Nigeria and DRC) remain in the No Progress category. High fertility in these countries will continue to have a significant impact on the demographic trajectory of the continent. Moreover, no countries in the review have attained fertility rates below four children per woman. Countries with stalled or increasing fertility rates (Burkina Faso, Côte d'Ivoire, DRC, Ghana, Mozambique, Niger, Nigeria, and Senegal) share a number of characteristics including large ideal family size and low rates of modern contraceptive use.

One important factor contributing to the pace at which fertility decreases is the contraceptive method mix. Countries with more mature family planning programs generally have a higher use of long-acting and permanent modern contraceptive methods. Figure 3 shows the contraceptive method mix (modern long-acting and permanent methods, short-acting methods, and traditional methods) for selected countries in the Rapid Progress and No Progress categories of mCPR uptake, where the differences in contraceptive mix are the most pronounced. Women in the Rapid Progress countries—Kenya, Malawi, and Senegal—are clearly using more effective long-acting and permanent methods, a higher percentage of short-acting methods, and fewer less-effective traditional methods than the No Progress countries. Benin, DRC, and Nigeria, with low contraceptive use and high fertility rates, show high reliance on traditional methods and low use of long-acting and permanent methods.

FIGURE 3

Modern Contraceptive Method Mix in Selected Countries by Categories of Progress



Source: ICF International, Demographic and Health Surveys.

Funding for Family Planning: Increasing Donor and Country Commitments

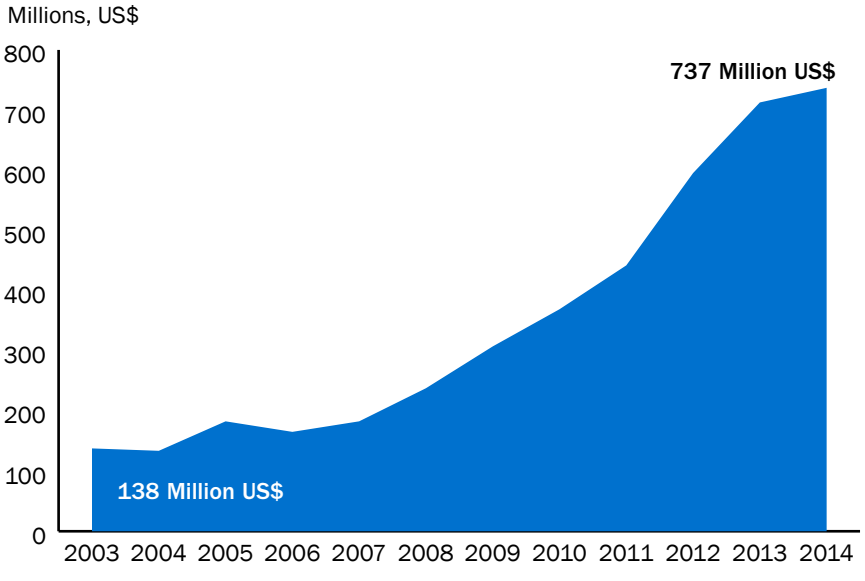
One of the most significant changes since the 2010 program review has been a notable increase in funding for family planning, both in country contributions and donor assistance. Between 2003 and 2008, donor funding for family planning was stagnant and national family planning budgets were negligible. That situation has changed markedly. New international donors are stepping up family planning assistance, and a growing number of countries are committing domestic resources to family planning. In 2014, the most recent year for which data are available, donor governments provided $1.4 billion to support bilateral family planning programs in low- and middle-income countries, an increase of more than $100 million (9 percent) from 2013 levels.[7]

In SSA, funding for family planning and reproductive health by all donors has increased steadily since 2008 (see Figure 4). USAID has historically been, and continues to be, the major source of family planning assistance in developing countries. The Bill & Melinda Gates Foundation has also emerged as a significant donor for family planning. Since 2011, other major donor countries, including the United Kingdom (UK) and France, have been playing larger roles. Expansion in family planning assistance also has included renewed

© Jake Lyell / Alamy Stock Photo

FIGURE 4

Total Family Planning and Reproductive Health Assistance to Sub-Saharan Africa, All Donors



Source: OECD, QWIDS (Query Wizard for International Development Statistics), 2015, accessed online at: https://stats.oecd.org/qwids/.

attention to West Africa. As part of the Ouagadougou Partnership, the government of France committed 100 million euros between 2011 and 2016 to eight West African countries that have historically received limited donor assistance (see Box 2).

In 2012, UK's Department for International Development hosted the historic London Family Planning Summit to launch the Family Planning 2020 (FP2020) initiative (see Box 3). A recently released FP2020 report reveals that family planning is increasingly a global development priority: Donor governments have increased bilateral funding for family planning by one-third since 2012.[8] The United States was the largest bilateral donor in 2014, providing $636.6 million or 44 percent of total bilateral funding. The UK was the second largest bilateral donor, accounting for nearly one-quarter of all funding at $327.6 million. The past year (2015) has seen the largest wave of new commitments to FP2020 since the 2012 London Summit, and signals a new era in thinking about the far-reaching benefits of strong family planning programs.

Connecting the Dots: Recognizing the Links Between Family Planning and Sustainable Development

The last decade was characterized by remarkable progress in achieving consensus around the impact of family planning on economic development, largely rooted in an upswing of attention to the possibility of a demographic dividend in Africa. The demographic dividend is the accelerated economic growth that may result from a decline in a country's birth and death rates and the subsequent change in the age structure of the population. With fewer births each year, a country's young dependent population declines in relation to the working-age population. With fewer young people to support, a country can achieve rapid economic growth if the right social and economic policies are developed and investments made.

Innovative Tools and Models

Growing recognition of the relationship between family planning, economic growth, and sustainable development has been accompanied by the proliferation and use of demographic planning tools and models. Over time,

BOX 2

The Ouagadougou Partnership

The Ouagadougou Partnership (OP) formed in 2011 to galvanize action around family planning in nine francophone West African countries: Benin, Burkina Faso, Côte d'Ivoire, Guinea, Mali, Mauritania, Niger, Senegal, and Togo. Representatives of the nine countries, governments, donors, and private agencies came together to address longstanding family planning challenges in West Africa—which lags behind other SSA regions—and to develop action plans for strengthening family planning programs and policies in the focus countries. In December 2015, the nine countries celebrated a significant achievement since the debut of the partnership: the addition of more than one million women (1,180,000) using modern methods of contraceptives. In addition, between 2012 and 2014, the six key OP donors increased their financing of family planning programs by 36 percent—from $80 million to $109 million. The partnership is now entering the "acceleration phase" with the goal of attaining an additional 2.2 million women using modern methods of contraceptives by 2020.

BOX 3

2012 London Summit and Family Planning 2020

In July 2012, the London Family Planning Summit, co-hosted by the UK government's Department for International Development and the Bill & Melinda Gates Foundation, brought together more than 150 leaders to launch a global movement to give an additional 120 million women in the developing world access to family planning information and services by 2020. As part of this movement, developing countries are encouraged to make public commitments to funding family planning programs in their respective countries. At the Summit, six countries pledged to increase their family planning budgets (Burkina Faso, DRC, Ethiopia, Niger, Tanzania, and Senegal). Since the Summit, an additional 30 countries have joined the FP2020 movement, bringing the total number of commitment-making countries to 36. This means that more than half of the 69 FP2020 focus countries are now formally pledged to the partnership. The commitments are specific statements of intent, outlining what actions the commitment-makers will undertake, what objectives they will pursue, what policy changes they will seek, and how much money they will invest. As such, they function as a blueprint for collaboration, providing partners with a shared agenda and measurable goals. Taken together, the FP2020 commitments add up to an enormous, unprecedented global undertaking to bring health and empowerment to millions of women and girls (see FP2020 countries and their commitments at: www.familyplanning2020.org/entities).

the models have become increasingly refined and have been successfully used as advocacy and planning tools to push for increased commitment for family planning. In 2005, the presentation of the RAPID model findings to Rwanda's president and Parliament triggered an unparalleled commitment to expand access to family planning, and the integration of family planning into major national development and economic growth strategies. In Kenya, the director general of the National Council for Population and Development is using the ImpactNow model to press for more domestic financing of family planning. As of 2015, 13 countries had commissioned at least one of these tools with donor support (see Box 4).

The increasing popularity and utilization of these tools reflects an important evolution in thinking about family planning and its impact on sustainable development goals, including an emphasis on the cross-sectoral impacts of family planning programs. Though originally used largely for advocacy purposes, ultimately these tools should be further refined through continued research on the relationships between demographic and development factors, and employed for program planning, strategic design, resource allocation, and policy reform purposes.

Accelerating Achievement of the Sustainable Development Goals

Recent analyses reveal the importance of family planning as a critical cross-sectoral intervention for achieving the 17 top-level Sustainable Development Goals (SDGs). While the evidence about how family planning influences individual SDGs is strong for some targets, research is shedding new light on its benefits for others.[9] Family planning's strong positive influences include ensuring healthy lives—reducing child and maternal mortality and improving maternal, child, and adolescent health—as well as supporting human rights, gender equality, and empowerment. Through its influence on reduced fertility and population growth, family planning also supports the achievement of the SDGs related to nutrition; education;

BOX 4

Innovative Family Planning Tools/Models and Countries Where Applied

RAPID A computer-based modeling tool that allows stakeholders to demonstrate the future effect of rapid population growth on different sectors and show how family planning programs can benefit these sectors. www.healthpolicyproject.com/index.cfm?id=topics-RAPID	Ethiopia Kenya Malawi Mali Nigeria Tanzania Uganda Zambia
ENGAGE These are dynamic, multimedia presentations depicting data in visually stimulating ways. These tools are used to engage leaders and policymakers on the impact of family planning on health, nutrition, education, economic, and other national development goals. www.prb.org/About/ProgramsProjects/ENGAGE-Multimedia.aspx	Benin Burkina Faso Malawi Kenya Senegal Ghana
DemDiv A modeling tool that allows users to design multiple scenarios showing how the combined power of policy investments in FP, education, and the economy can generate a long-term demographic dividend compared to the status quo. www.healthpolicyproject.com/index.cfm?id=software&get=DemDiv	Kenya Tanzania Uganda
ImpactNow This tool helps decisionmakers and policy advocates make the case for family planning investments by demonstrating possible benefits in the next two to seven years. www.healthpolicyproject.com/index.cfm?id=software&get=ImpactNow	Ethiopia Kenya Malawi Zimbabwe

poverty reduction and economic growth; food, water, and energy security; and environmental sustainability. In today's financially strapped environment, family planning is a development "best buy" that can facilitate country-level changes in the years ahead that, ultimately, accelerate progress across the SDGs.[10]

Achieving the SDGs

"Without universal access to family planning, the impact and effectiveness of other interventions will be less, will cost more, and will take longer to achieve..."

Source: Ellen Starbird, et. al, Investing in Family Planning: Key to Achieving the Sustainable Development Goals, 2016

Taking Stock of Family Planning's Short-Term Benefits

Often family planning is low on the priority list of development programs because it is believed to make a positive impact on changes in age structure only in the long run—after 15 to 20 years. But family planning is not just about long-term benefits. Family planning has beneficial effects on individuals, households, communities, and societies that begin in the short term and cascade forward into future generations.

The short-term impacts on households begin as soon as a woman decides to postpone pregnancy or not to have additional children. Immediately, her household's income can be used to support current dependents, allowing for more resources to be allocated to health, education, and other human capital investments for each existing child. Delaying or preventing pregnancy also improves maternal health and nutrition, and provides more time for a woman to engage in other activities, potentially increasing household income.

Over the long term, these household effects are aggregated and magnified. At the national level, due to a lower average family size, the smaller population of children entering school diminishes demands on the education sector, allowing education expenditures per child to grow on a per capita basis, or providing governments with savings to invest in other sectors. As these smaller cohorts of children reach working age, fewer new jobs are required, potentially improving their prospects for employment and income generation.

Conclusion

In the first decade of the 21st century, family planning programs in SSA languished and donor funding stagnated. The majority of countries were making slow progress in modern contraceptive uptake. While family planning was widely credited with improving the health of women and children, slowing the pace of population growth to make it easier for governments to meet the social investment needs of the population, and positively affecting per capita income (as fertility goes down, income per capita rises), few national leaders recognized the broader role of family planning in accelerating and sustaining national economic growth and fostering competitiveness in the global economy.

Today, there are encouraging signs that things are beginning to change. Many countries have made impressive gains in expanding the reach of their family planning programs and making more rapid progress in their annual rates of modern contraceptive uptake. Innovative planning and advocacy tools are raising the visibility of family planning, helping policymakers and leaders recognize the multiple cross-sectoral benefits of family planning. New research is revealing the influence and crucial role of family planning in accelerating the achievement of the 2030 SDGs. And an unprecedented number of donors and country governments are stepping up to fund family planning, pledging their commitments to expand access to voluntary, high-quality family planning programs and to support the policies and investment necessary to sustain them. This enthusiasm and movement is testament not only to the compelling power of new initiatives such as the OP and FP2020, but to the growing value of the family planning platform as a catalyst for change.

SECTION III

LOOKING AHEAD: EXPLORING THE IMPACT OF FAMILY PLANNING ON INCLUSIVE ECONOMIC GROWTH

Robust family planning programs will be essential to achieving inclusive economic growth and accelerating poverty reduction.

The global development community has rallied around the commitment to end extreme poverty by 2030. USAID defines extreme poverty as "the inability to meet basic consumption needs on a sustainable basis. People who live in extreme poverty lack both income and assets and typically suffer from interrelated, chronic deprivations, including hunger and malnutrition, poor health, limited education, and marginalization or exclusion."[11] The Common African Position, adopted to inform negotiations by African heads of state and the governments of the African Union on the post-2015 global SDGs, established an overarching goal of "eradicating poverty by making growth inclusive and people-centered…."[12] Robust family planning programs will be absolutely essential to reaching that ambitious goal.

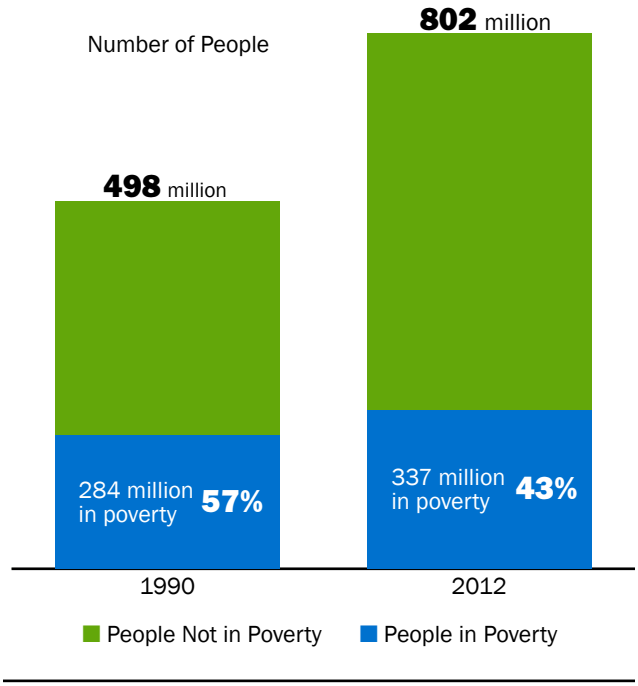
Africa's strong economic growth has contributed to a substantial reduction in the poverty rate. According to World Bank estimates from household surveys, the share of people in Africa living on less than $1.90 a day fell from 57 percent in 1990 to 43 percent in 2012. However, while the poverty rate has fallen, the absolute number of people living in poverty in the region has increased from 284 million in 1990 to 337 million in 2012—53 million more people in poverty, largely due to continuous, rapid population growth (see Figure 5).[13]

A key driver of poverty reduction is inclusive economic growth.[14] While each country's path is unique, economic growth thrives on investments in human capital. For example, research in Africa reveals strong evidence linking investments in health and nutrition to improved productivity and economic development.[15] It is the virtuous cycle of health feeding into wealth, which then feeds back into health. But which comes first, health or wealth? And what factors help determine the path?

One critical factor to improving health and wealth is lower fertility. By lowering fertility, families and governments can allocate more resources per child—resulting in improved health and nutrition. Data from the East Asian Tigers such as Thailand, Malaysia, and South Korea, which have achieved both health and wealth, show

FIGURE 5

More Than 50 Million Additional People in Africa Live in Poverty in 2012 Compared to 1990



Source: World Bank Group, *Poverty in a Rising Africa*, 2016.

that lower fertility, and improved health and nutrition status came before economic take-off. In addition, there is strong evidence in Africa and elsewhere to show that investing in the health and nutrition of young children pays off in terms of productivity and family wealth as well as human capital in these countries.[16]

Evidence also indicates that successful efforts to promote inclusive economic growth advances equitable opportunities for people in every section of society, but especially for the poor and disadvantaged, helping them better withstand external shocks and stresses.[17,18] The following section builds upon this evidence and looks forward, exploring the impact of family planning on three key components of development, all crucial to eradicating extreme poverty: **strengthening global competitiveness** to accelerate and sustain economic growth, **enhancing equity**, and **building resilience**.

Strengthening Global Competitiveness: The Role of Family Planning

Voluntary family planning can help sustain and accelerate national economic growth and increased competitiveness in the global economy.

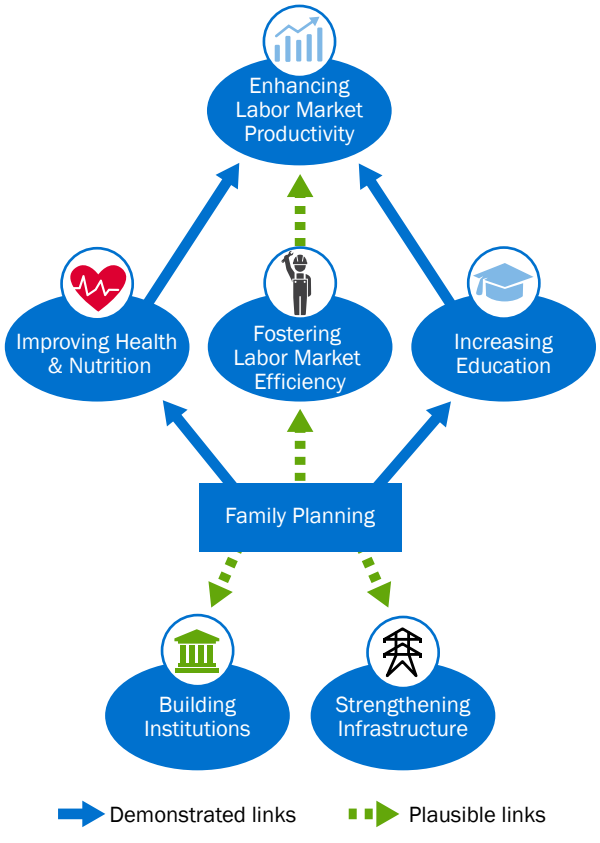
Maintaining a high level of competitiveness is important in a global economy. For SSA, this will be imperative if the region is to emerge as an increasingly important global player. SSA has registered impressive economic growth averaging 4.5 percent annually over the last two decades. Sustaining or regaining that momentum, especially in light of a recent slowdown in growth in 2016, will require the region to move towards more productive activities and address persistent competitiveness challenges.[19]

The World Economic Forum defines economic competitiveness as the "set of institutions, policies, and factors that determine the level of productivity of a country." Productivity largely determines the level of prosperity the economy can reach. According to the Global Competitiveness Report (2014-2015), the majority of African countries rank among the least competitive in the world.[20] The report identifies 12 pillars that affect competitiveness. Five of those pillars—health and nutrition, education, labor market efficiency, infrastructure, and institutions—are linked to or influenced by family planning. Many SSA countries could improve their competitiveness through improvements in family planning programs.

As illustrated in Figure 6, this section identifies the channels through which family planning contributes to economic growth and presents the direct and hypothesized impacts on selected competitiveness pillars. It presents the well-established influence of family planning on labor market productivity through improved health,

FIGURE 6

The Central Role of Family Planning in Strengthening Competitiveness and Productivity



Source: Adapted from "The 12 Global Pillars," The World Economic Forum, The Global Competitiveness Report 2014 -2015.

nutrition, and education, as well as through slowed population growth. In addition, it explores the existing evidence regarding the less-researched links (plausible links) between family planning and three of the competitiveness pillars: labor market efficiency, infrastructures, and institutions. A strong case can be made that family planning has a positive effect on competitiveness outcomes. However, it is difficult to determine how much of this contribution is due to other factors, including women's status and job skills that influence family planning effectiveness as well as competitiveness. The authors hope that presenting these plausible pathways will motivate researchers to further examine the links and the potentially transformative role of family planning.

Enhancing Labor Productivity

Family planning programs positively impact health, nutrition, and education opportunities of populations, contributing to improvements in labor productivity.

Labor productivity, or the amount of real Gross Domestic Product (GDP) produced by an hour of labor, is the foundation of a growing economy. Family planning programs enhance labor productivity by improving health and nutrition, and by facilitating transitions in age structure that are conducive to improved education.

Health and Nutrition. A healthy workforce and a healthy population are critical for competitiveness and economic development. Investments in health directly contribute to increased individual productivity; healthier workers have lower rates of absenteeism, are more physically and mentally energetic, and earn higher wages. Additionally, increases in productivity boost employment, as employers' demand for labor rises when workers are more productive. One analysis of over 100 countries showed that a 1 percent increase in adult survival rates increases labor productivity by 2.8 percent.[21] Comparative studies of East African businesses have shown that absenteeism due to HIV/AIDS can account for as much as 25 percent to 54 percent of total company costs.[22]

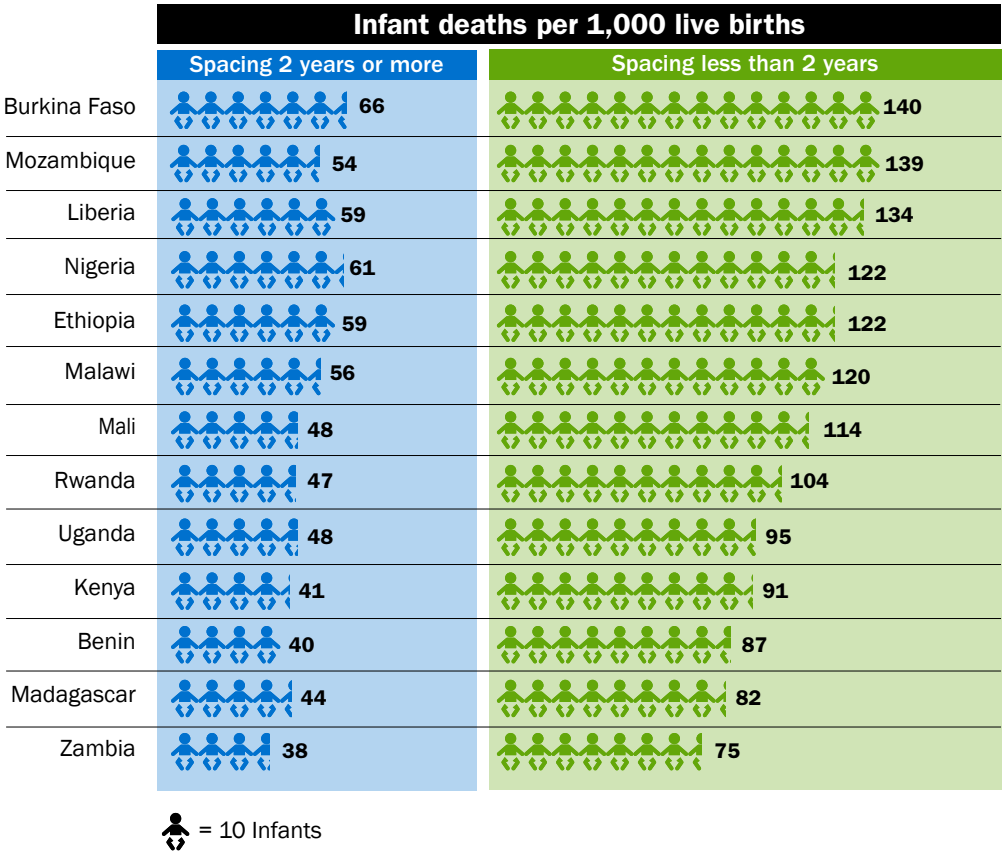
Family planning has a direct impact on the health of mothers and children, which produces a lasting effect on workforce productivity. Family planning leads to significant reductions in maternal mortality by allowing women to delay, space, and limit births and to avoid unintended and high-risk pregnancies.[23] Moreover, for every maternal death, at least another 20 to 30 women suffer serious illness or debilitating injuries from pregnancies or pregnancy-related causes.[24] Maternal disabilities can severely affect women's health and productivity long after pregnancy and delivery.

Healthy timing and spacing of births also reduces the risk of child mortality, prematurity, low birth weight, and small size for gestational age—birth outcomes that can lead to early death and illness, as well as chronic diseases later in life that are linked to work absenteeism, hospitalizations, and the need for long-term care. The World Health Organization (WHO) recommends that births be spaced at least 33 months (24 months between last birth and next conception + 9 months of pregnancy) for best infant and child health outcomes.[25] In the majority of 21 review countries, infants born less than two years from the previous birth are more than twice as likely to die than infants born with an interval of two years or more (see Figure 7).

Family planning also improves infant, child, and maternal nutrition, which can significantly affect labor productivity.[26] By supporting birth spacing and delaying adolescent pregnancies, family planning can help avert a range of poor infant and child nutrition outcomes, particularly stunting. Stunting causes irreversible damage, impairing cognitive function as well as physical and emotional development. This means that stunted children will have poorer school performance and achievement, thereby limiting their workforce capacity and economic opportunities during adulthood.[27] Proper feeding practices such as exclusive breastfeeding and complementary feeding during a child's first 1,000 days also play a critical role in preventing stunting and other forms of malnutrition. With well-spaced births, mothers are more likely to have the time, energy, and resources for such practices, ensuring their children grow up healthy and live up to their full potential.

FIGURE 7

Infants born less than two years from the previous birth are almost twice as likely to die than infants born at a two-year or greater interval



Source: ICF International, Demographic and Health Surveys.

Education. Productivity in the labor force is strongly influenced by the skills and knowledge acquired in high-quality educational settings.[28] Investing in the education value chain—from primary and secondary education to higher education and vocational schools—to upgrade the skill levels of young people will pay large dividends in Africa's future economies.[29] Family planning programs complement those investments by influencing population growth (particularly the number of school-age children) and age structure—two key drivers of demand for education—and by helping girls avoid pregnancy and stay in school. As shown in Table 2, family planning and education have a mutually reinforcing relationship. Total fertility rates are significantly lower among women who have secondary or higher education than among those with no or primary education. Likewise, modern contraceptive use is higher among women with secondary or higher education compared to women with no or primary education.

TABLE 2

Total Fertility Rate and mCPR by Level of Education

		TFR		mCPR (%)	
Country	Survey	None or Primary	Secondary or Higher	None or Primary	Secondary or Higher
Rapid Progress (annual increase > 2 percent and/or mCPR ≥ 40%)					
Ethiopia	2014 DHS	N/A	N/A	N/A	N/A
Kenya	2014 DHS	4.7	3.0	49.9	59.0
Madagascar	2008-09 DHS	5.6	3.1	27.1	34.4
Malawi	2010 DHS	6.2	3.6	41.1	48.5
Rwanda	2014/2015 DHS	4.5	3.0	47.2	49.1
Senegal	2014 DHS	5.6	3.2	18.3	33.4
Zambia	2013-14 DHS	6.4	3.8	40.3	53.5
Encouraging Progress (annual increase >1 & ≤ 2 percent)					
Liberia	2013 DHS	5.5	3.4	16	27.1
Niger	2012 DHS	7.9	4.9	11.2	30.0
Tanzania	2010 DHS	5.9	3.0	26.7	35.5
Uganda	2011 DHS	6.8	4.8	22.6	37.7
Slow Progress (annual increase ≥ 0.5 & ≤ 1)					
Burkina Faso	2010 DHS	6.4	3.1	12.9	44.2
Ghana	2014 DHS	5.5	3.5	21.2	23.1
Mali	2012-13 DHS	6.5	4.0	8.3	26.5
Togo	2013-14 DHS	5.5	3.5	16	21.4
No Progress (annual increase < 0.5)					
Benin	2011-12 DHS	5.3	3.8	7.2	13.2
Congo, Democratic Republic	2013-14 DHS	7.5	5.6	4.6	12.9
Côte d'Ivoire	2011-12 DHS	5.5	2.6	11.5	19.9
Guinea	2012 DHS	5.6	3.0	4.2	8.8
Mozambique	2011 DHS	6.4	3.4	8.7	31.2
Nigeria	2013 DHS	6.7	4.2	5.1	19.5

Source: ICF International, Demographic and Health Surveys.

SSA has seen a rapid increase in the number of children who complete primary school, from about 50 percent in 1991 to 70 percent in 2011.[30] However, in the majority of countries in SSA, less than half of secondary-school-age adolescents are enrolled in secondary school, leaving millions of young people entering the workforce without the necessary academic and life skills.[31] Moreover, concerns about the quality of education abound: Forty-three percent of sixth-graders in Tanzania and 74 percent of sixth-graders in Mozambique are at or below the basic numeracy level, while 44 percent in Mozambique cannot read for meaning.[32] Even students who make it to the secondary level—those who will most likely head to the modern wage sector—are not globally competitive. In the most recent international assessment of eighth- and ninth-grade students, 79 percent of Ghanaians and 76 percent of South Africans do not surpass the lowest-measured level of math proficiency.[33]

One of the important issues in training quality is the pupil-to-teacher ratio. Schools in the region are suffering from high pupil-to-teacher ratios compared to other regions of the world with an average of about 45 pupils per teacher in SSA, compared to 23 pupils per teacher in Latin America and the Caribbean, and 19 pupils per teacher in East Asia and the Pacific (see Figure 8). In Malawi, for example, there are on average, 130 children per class in the first grade.[34] In August 2015, in the face of high pupil-to-teacher ratios and exhausted resources, the Minister of Education of Uganda made a public appeal advocating for smaller family size, stating, "The rapid population growth…is putting pressure on the existing resources and facilities."[35]

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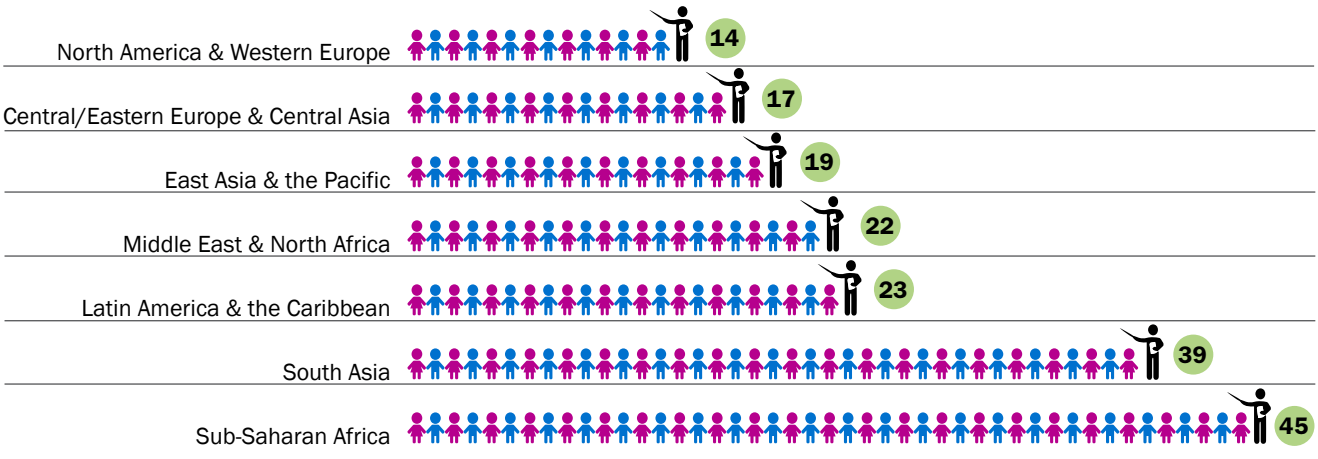
FIGURE 8

Primary School Student-to-Teacher Ratios (2005-2010 Average)



Source: Shashi Buluswar, et al., The Institute for Globally Transformative Technologies (LIGTT), *50 Breakthroughs—Critical Scientific and Technological Advances Needed for Sustainable Global Development*, Lawrence Berkeley National Lab, Berkeley, CA, 2014.

A successful family planning program can make a big difference in the number of children that need to be educated for a productive labor force. In 2000, there were 40 million children in SSA entering school ages. By 2015, this number had grown to 59 million and is projected to reach 70 million children by 2025. The difference between low variant and medium variant population projections is just a half a child, but this small difference can have significant consequences for the burden of education for country governments. Figure 9 presents the population of children younger than age 15 in 2015, and by 2025 and 2050, by low and medium variant scenarios for selected countries in this review. The implications of these projections include:

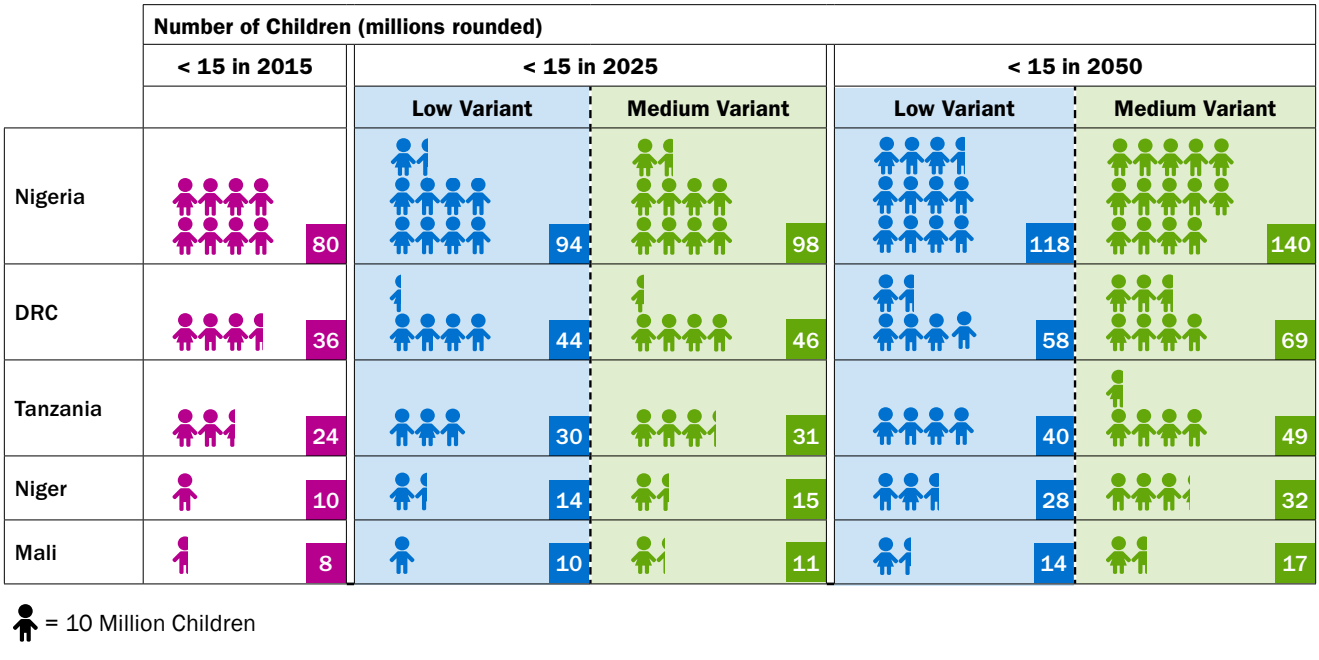
- In Nigeria, the medium-variant population projections by 2050 would mean almost double the number of additional children requiring quality education compared to the low-variant scenario (42 million more children versus 24 million). Even in the short term (from now until 2025), achieving the low-variant scenario would mean about 4 million fewer children that need to be educated.

- The DRC would have an estimated 24 million more children to educate under the medium-variant scenario by 2050 compared to 14 million more in the low variant—10 million fewer children—and Tanzania would have 18 million more children versus 11 million more children to educate by 2050—or 7 million fewer children under the low-variant scenario.

- In West Africa, the increases in the number of children will be greatest in countries that currently face significant challenges in providing education, including Mali and Niger, which will have 28 million additional children and 47 million more children, respectively, by 2050 under the medium-variant scenario (see Appendix A for the data for all 21 countries).

FIGURE 9

Numbers of Children <15 Years Old Current and Projected in 2015, and in 2025 and 2050 with Low and Medium Variant Scenarios



Source: United Nations, *World Population Prospects: 2015 Revision.*

Finally, family planning also facilitates keeping girls of reproductive age in school, thereby enhancing gender parity once these young women enter the workplace. A World Bank study on returns to investments in education demonstrated that every additional year of primary school for women can boost wages by 10 percent to 20 percent, while every extra year of secondary school can boost wages by 15 percent to 20 percent.[36] SSA has the lowest total share of women with at least a lower-secondary education compared to other regions of the world. Thus, family planning investments that promote keeping girls in school, particularly in secondary school, have far-reaching and long-term health and economic benefits for women and their families (see Map 1).

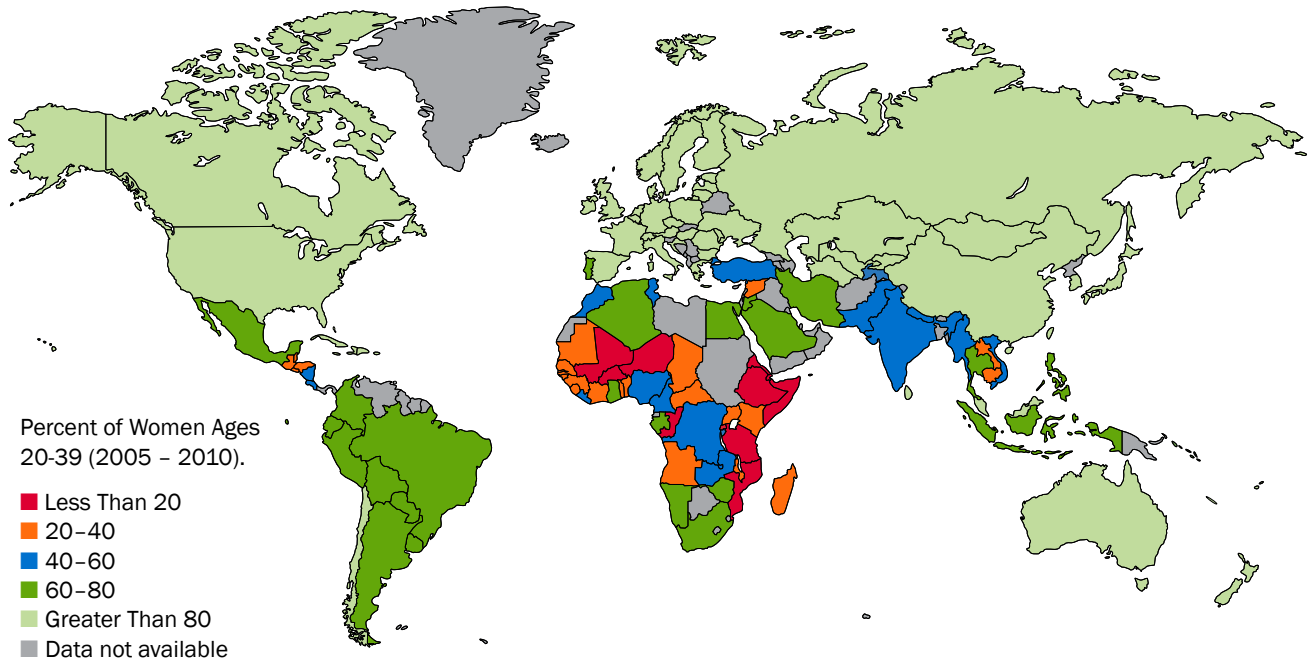
Improving Labor Efficiency

Family planning can contribute to reduced unemployment and underemployment, and facilitate structural shifts in employment that will help SSA better meet the demands of the 21st century.

According to the World Economic Forum, labor market efficiency means ensuring that workers are allocated to their most effective use in the economy and provided with incentives to achieve maximum productivity. Greater labor market flexibility also increases the ability of a country to reallocate production to emerging segments and adapt the workforce to the new needs of high-tech sectors.[37] This section presents the existing

MAP 1

Sub-Saharan Africa has the Lowest Total Share of Women with at Least Lower Secondary Education



Source: Oxford Institute of Population and Ageing 2012. Map originally created by World Resources Institute.

evidence and postulates additional links between family planning and labor market efficiency. Specifically, the discussion shows how family planning can contribute to labor market efficiency by reducing the number of persons entering the job market, thereby:

- Reducing unemployment and underemployment.
- Facilitating structural shifts from low-productivity to high-productivity employment.

Reducing unemployment and underemployment. While several factors influence employment rates, the number of new entrants to the labor force plays a significant role. Few if any countries in SSA can generate enough new high-productivity jobs to absorb the rapidly growing numbers of young people entering the job market today (see Box 5). SSA already has one of the highest unemployment and underemployment rates in the world. The vast majority of African workers—63 percent—remain in vulnerable employment, which refers to own account workers who are self-employed mostly in subsistence activities such as agriculture or informal urban activities, and unpaid family workers who work without a formal wage for another household member in a market-oriented establishment or in agriculture.[38] Youth unemployment presents a particularly serious problem. **A World Bank study indicates that 11 million youth will enter Africa's labor market every year for the next 10 years and that as many as three of every four youth will not find and sustain a wage job.**[39] According to a Gallup Survey, youth ages 15 to 29 in SSA were three times more likely to be unemployed than their older counterparts.[40]

BOX 5

How Many High-Productivity Jobs Will Be Needed?

The International Monetary Fund (IMF) projects that to maximize a prospective demographic dividend, countries in SSA would need to create an unprecedented number of high productivity jobs—an average of 18 million per year until 2035—to accommodate new entrants to the labor force and to convert those in low-productivity jobs to high-productivity jobs.[1] To put this number in perspective, African countries added a total of 37 million such jobs over the period 2000 -2010.[2]

Sources: [1] IMF, Regional Economic Outlook, 2015; [2] McKinsey Global Institute, Africa at Work: Job Creation and Inclusive Growth, 2012.

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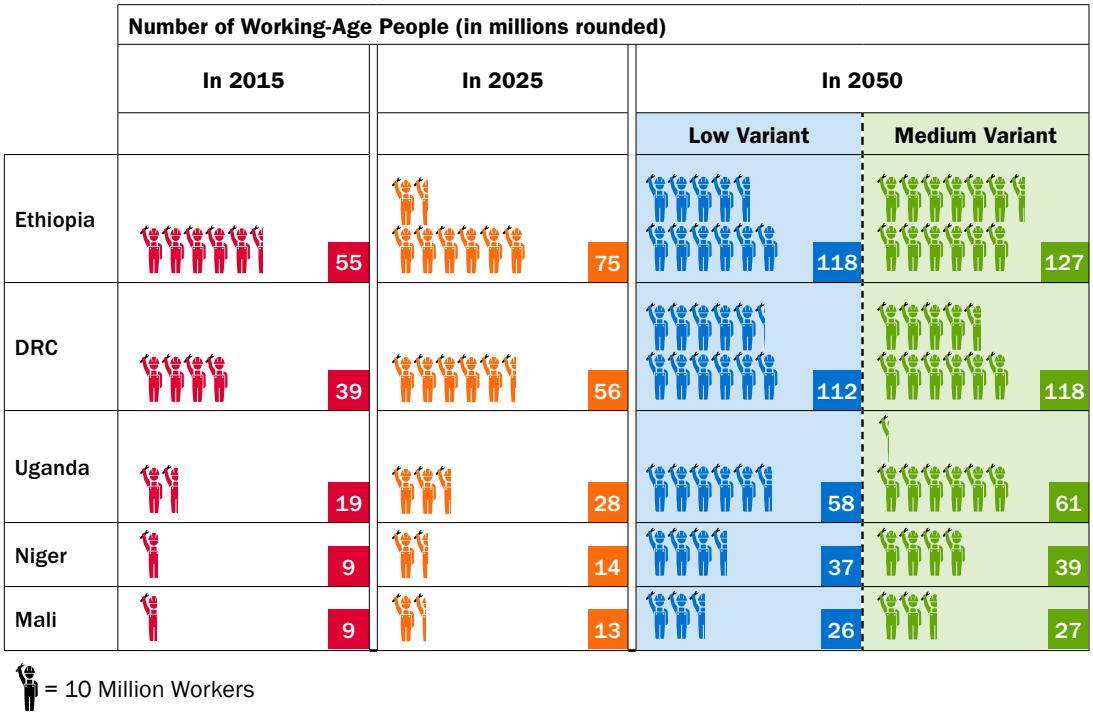
While family planning programs cannot make a difference in the anticipated increase in the working age population during the next 15 years (as those who will enter the working-age group in 2025 are already born), a strong family planning program today can make a difference in slowing growth in the working-age population starting in 2025 (see Figure 10).

- In Ethiopia, under the medium-variant fertility decline scenario, the working-age population would more than double, from 55 million in 2015 to 127 million in 2050—72 million more workers. Achieving the UN's low-variant population projections starting today would mean its labor force would have to absorb only 63 million workers or about 9 million fewer persons in the working ages in 2025. In addition, with fewer numbers of children to educate in the short run, the government would have more education expenditures to spend per capita leading to a better-educated workforce in the long run.
- Under the medium-variant fertility decline scenario, between 2025 and 2050, Uganda will have more than triple the number of workers compared to today—from 19 million to 61 million—and Niger's workforce will quadruple in the same period (from 9 million to 39 million). But under the low-variant estimates, Uganda will have 3 million fewer workers and Niger will have 2 million fewer in the workforce during the same period. Reducing fertility through expanded use of family planning could go a long way toward relieving pressure on these future labor markets (see Appendix B for the data for all 21 countries).

Beyond the personal cost of unemployment to individuals, unemployment and underemployment also have significant actual and opportunity costs. Low employment has a dual impact: loss of earnings or contributions to the economy by potentially productive members (especially youth), and the diversion of resources from productive investments to social welfare services. Rather than contributing to household

FIGURE 10

Numbers of Working-Age People Current and Projected in 2015 and 2025, and in 2050 With Low and Medium Variant Scenarios



Source: United Nations, *World Population Prospects: The 2015 Revision*.

income, unemployed persons essentially become dependents, reducing the ability of the household to save and invest in order to improve their socioeconomic status or escape poverty.

Facilitating Structural Shifts in Employment. Economic development is associated with a structural shift from low-productivity to high-productivity employment, typically from agriculture to industry and services or from informal to formal employment. In Africa, among the employed population, only about 16 percent have jobs paying a regular wage. The industrial sector accounts for less than 20 percent of wage jobs (or 3 percent of total employment), with the remaining jobs in the informal sector—either subsistence farming (62 percent) or household enterprise (22 percent). These informal sector (or vulnerable) jobs tend to be associated with low earnings.[41]

A study by the International Labor Organization indicated that as many as nine in 10 rural and urban workers have informal jobs, and this is especially the case for women and young people, who rely on the informal economy for their survival and livelihood.[42] Poor households typically have a "portfolio of work" where it is common for each worker to earn income from many sources, from agriculture to casual labor to petty trade.[43] In this context, in the short term, one way to increase incomes is to improve portfolios of work, helping poor people raise their productivity in their current occupations, and helping them access new occupations that offer higher earnings.[44] Looking further ahead, it is crucial to ensure that greater numbers of workers are swept along in the shift toward more-diversified and developed economics.[45] Focusing on ways to improve both informal-sector productivity, while at the same time adding higher paying industry jobs, remains a formidable challenge for Africa's resource-strapped countries.

An additional challenge for SSA is the technology or digital revolution. Technological advances may shift the pattern of structural transformation in Africa, changing the productivity of different sectors including agriculture. The ability to take advantage of opportunities could vary among individuals; workers with higher levels of skills will be more likely to benefit, while those with lower skill levels might be less prepared and hence more exposed to risks of lower job quality and of job loss.[46] In the long run, it remains to be seen if technology will expand employment opportunities, particularly in the service sector, or constrict opportunity by reducing the need for manpower.

African policymakers can drive the structural transformation of their countries' economies by adopting policies that enhance agricultural productivity, promote private sector development and industry, strengthen infrastructures, and prepare for the technological changes on the horizon.[47] However, family planning will play an increasingly important role in determining the outcomes and ultimate impact of these efforts. The reduced fertility driven by family planning could help create breathing room for countries to transfer a larger share of their workforce to higher-income jobs and provide quality education to meet the changing demands of the 21st century labor market.

Building Strong National Infrastructure

Family planning can enhance the savings and investments necessary to build a strong national infrastructure by reducing dependency.

Changes in age structure, particularly changes in the number of dependents, have a profound impact on economic development because of their impact on savings and investment. As a country attains higher numbers of working-age adults compared to dependents, it can

Total Dependency Ratio

Populations who are dependent (those ages <15 and 65+) divided by working-age population (those ages 15-64)

take advantage of the "opportunity to make rapid gains in living standards because income can be used for productive investment rather than expended on support of young and old people."[48] A study using econometric analysis found that relatively low savings, investment, and human capital development in Africa can be largely explained by the dynamics of Africa's dependency ratios. The total dependency ratio is the dependent population (< 15 and 65+) divided by the working-age population (those ages 15 to 64). Countries with high dependency ratios are stuck in an economic equilibrium at a lower per capita income. These results also suggest that a one percentage point increase in the dependency ratio can suppress GDP per capita by about 1.4 percent. This relationship may be even stronger in Africa.[49]

In China, Malaysia, South Korea, and Thailand, dependency ratios have changed dramatically over the last five decades (see Box 6). In SSA, two countries—Botswana and South Africa—are making headway at a faster rate than other countries in the region owing to lower fertility rates at 2.9 and 2.6 respectively, but the pace of change remains slow. Dependency ratios will continue to remain high unless countries in Africa achieve low-variant fertility projections.

Even if countries were to succeed in bringing about a rapid fertility decline to the medium-variant scenarios, improvements in dependency ratios will be minimal, and most will not reach the dependency ratio pivot point of 50 (100 workers to 50 dependents)—even in the year 2050. According to historical experience in Asian countries, a dependency ratio of 50 or less is associated with an increase in savings and investments as well as improvements in health, nutrition, and education. Rapid achievement of the low-variant scenarios would be ideal, although most countries, with the exception of Ethiopia, Ghana, and Rwanda, would still have dependency ratios greater than 50 in 2050 (see Table 3).

BOX 6

Dependency Ratios in Selected Countries (1980 to 2015)

Dependency Ratio[1]	1980	2000	2010	2015
China	68.0	46.4	34.5	36.6
Malaysia	74.1	59.1	47.4	43.6
South Korea	60.7	39.5	37.6	37.2
Thailand	76.0	44.0	39.1	39.2
Botswana	96.0	69.8	57.6	55.3
South Africa	80.7	63.5	56.2	52.1

Source: United Nations, *World Population Prospects: The 2015 Revisions*. Total dependency ratio (<15 & 65+)/(15-64) by major area, region and country, 1950-2100 (ratio of population 0-14 and 65+ per 100 population).

While there are a number of factors that affect building strong national infrastructures, dependency ratios are key influences. The authors of this review hypothesize that strong family planning programs are a critical factor in achieving optimal dependency ratios, thus making family planning central to strengthening infrastructures. Countries with high dependency ratios spend large shares of their resources taking care of dependents, while those with lower ratios are able to devote more resources to investment in physical capital—such as roads, bridges, electricity, and communication infrastructures—technological progress and education.[50] Well-developed infrastructure allows entrepreneurs to move their goods and services unhindered, integrating the national market and connecting it to markets in other countries and regions. In addition, the quality and extent of electricity, transportation, and communication infrastructure networks significantly impact economic growth and reduce income inequalities and poverty in a variety of ways such as ensuring the access of less-advantaged communities to core economic activities and services.[51]

TABLE 3

Dependency Ratios for Medium and Low Variant Scenarios by 2025 and 2050

		Medium Variant		Low Variant	
Country	**2015**	**2025**	**2050**	**2025**	**2050**
Rapid Progress (annual increase > 2 percent and/or mCPR ≥ 40%)					
Ethiopia	81.6	49.0	67.2	63.5	42.4
Kenya	80.9	59.1	71.5	67.7	52.1
Madagascar	80.3	61.2	74.8	70.8	54.0
Malawi	94.5	63.3	84.0	80.1	56.5
Rwanda	78.1	50.5	64.4	60.6	44.0
Senegal	87.6	65.1	81.1	77.4	58.7
Zambia	95.4	71.1	86.0	82.2	64.2
Encouraging Progress (annual increase >1 & ≤ 2 percent)					
Liberia	82.9	59.2	73.0	69.4	52.4
Niger	113.0	86.8	112.3	108.7	80.2
Tanzania	93.8	68.9	86.7	82.8	61.6
Uganda	102.3	66.2	89.6	85.7	59.1
Slow Progress (annual increase ≥ 0.5 & ≤ 1)					
Burkina Faso	92.2	63.7	82.0	78.4	57.0
Ghana	73.0	56.0	67.4	63.8	49.6
Togo	81.8	60.1	73.1	69.4	53.0
No Progress (annual increase < 0.5)					
Benin	82.0	57.2	72.8	69.2	50.6
Congo, Democratic Republic	95.9	65.9	87.5	83.9	59.1
Côte d'Ivoire	83.5	64.0	78.6	74.8	56.8
Guinea	83.8	59.1	77.0	73.4	52.3
Mali	100.2	68.1	90.3	86.8	61.2
Mozambique	94.8	64.8	86.0	82.3	58.1
Nigeria	87.7	64.4	81.2	77.8	58.1

Source: United Nations, *World Population Prospects: The 2015 Revision*.

Fostering Strong, Transparent Institutions

Voluntary family planning can foster strong, transparent institutions by creating a conducive environment for democracies and good governance.

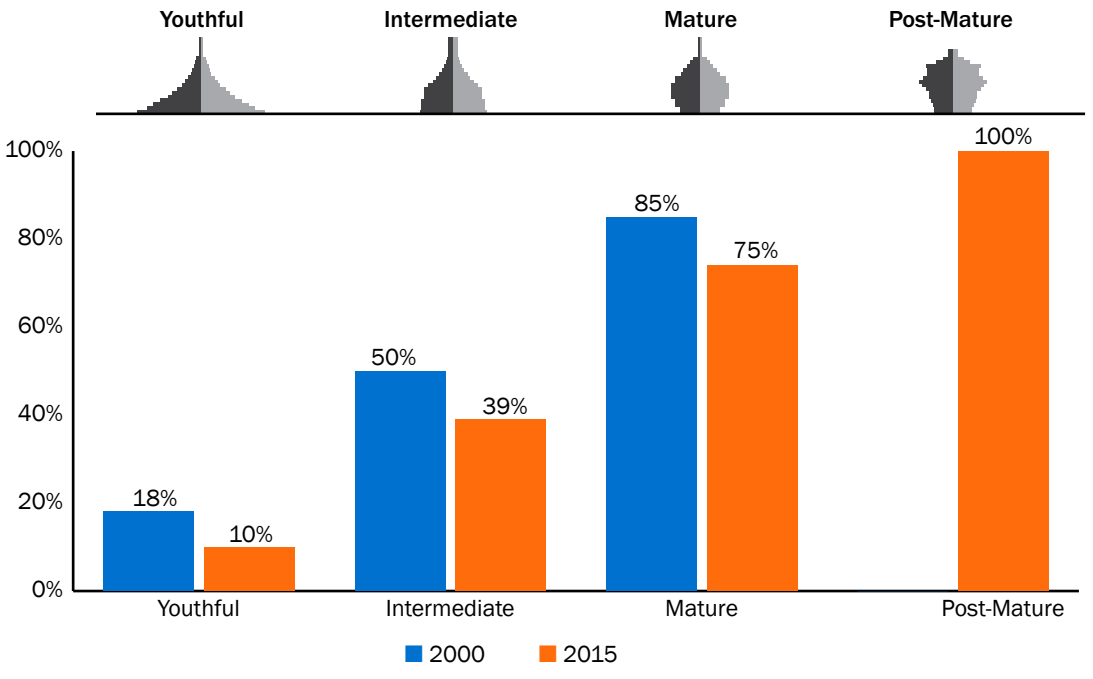
The institutional environment is determined by the legal and administrative framework within which individuals, firms, and governments interact to generate wealth.[52] The quality of institutions has a strong bearing on competitiveness and growth. It influences investment decisions and how production is organized and plays a key role in the ways in which societies distribute the benefits and bear the costs of development strategies and policies. Government attitudes toward markets and freedoms and the efficiency of government operations are also very important: Accountability, honesty in business transactions, transparency and trustworthiness, protection of the rights of business owners, and political independence of the justice system are all hallmarks of democracies and promote the process of economic development.[53]

Further declines in fertility may be necessary to achieve and maintain high levels of democracy in SSA. A growing body of literature demonstrates that attaining and sustaining high levels of political rights and civil liberties (liberal democracy)+ is much less likely in countries with a youthful age structure compared to countries with a more mature age structure (see Figure 11).[54] Once this age-structure shift occurs, it ends the period when workforce growth is exceptionally high, young adults dominate the working-age population, and young

+ As defined by the Freedom House, countries with liberal democracies are defined as "Free." Countries assessed with lower levels of political rights and civil liberties are considered "Partly Free" or "Not Free."

FIGURE 11

Percent of Countries in Each Age Structure That Are Liberal Democracies



Note: In 2000, no countries were in the post-mature category. In 2015, three countries—Japan, Germany, and Italy—all liberal democracies, had post-mature age structures.

Source: Richard Cincotta, "Who's Next? Age Structure and the Prospects of Democracy in North Africa and the Middle East." in Population Change in Europe, the Middle East, and North Africa: Beyond the Demographic Divide, Christiane Timmerman, ed., London: Ashgate, 2015.

men experience excessive difficulties in transitioning to adulthood. Family planning programs contribute to building democracies by allowing women and couples to have the spacing and number of children they desire, thus reducing fertility and creating a more mature age structure.

More recent research demonstrates that median age—the age at which half the population is younger and half is older—is a statistically predictive indicator of social and political stability.[55] The younger the population, the greater the risk of experiencing civil conflict; the more mature the age structure, the more likely a country is to attain liberal democracy and retain it. An analysis using the UN demographic estimates to develop statistical models for several state behaviors (including democratization and intra-state conflict) concludes that:[56]

- Countries near **a median age of 29** have a 50 percent chance of being assessed as a liberal democracy, demonstrated by states in the 1970s (Portugal, Greece, Spain) to more recent transitions (South Korea, Taiwan, Brazil, and Tunisia). Thus far, the probability of achieving liberal democracy increases as age structures mature. Furthermore, by the time countries reach a median age of 30, they typically have relatively high levels of educational attainment and a functioning middle class.

- Countries **at or below a median age of 26 years** infrequently achieve liberal democracies. When they do, most decline to partial democracy or autocracy within 10 years. Since the 1970s, about half of those youthful liberal democracies that declined also incurred political violence during the decline.

- Countries with a **median age of less than 20 years** are the most vulnerable to low-intensity civil and ethnic conflict and state-sponsored violence. When any of these states have achieved political stability, it has typically been under an authoritarian regime.[57]

As mentioned earlier, for countries to be seen as legitimate in the eyes of citizens, governing institutions must deliver services in a transparent manner. This becomes much more challenging in countries with less mature age structures, where governments are overwhelmed and those institutions are stressed. Youth then become disillusioned when they don't get services or jobs and feel marginalized, resorting to violence or extremism. Moreover, even in countries that have intermediate and mature age structures, regions with youthful minorities are sometimes at the epicenter of social conflict. Strong voluntary family planning programs that reach marginalized minorities with quality services could help reduce some countrywide inequalities. Family planning also directly contributes to smaller family size and to the shift in age structure from a youthful population to a more mature population, thus helping to lay the foundation for social and political stability—a cornerstone of robust national institutions.

Conclusion

New evidence is showing that voluntary family planning programs could have an important role in strengthening economic growth and competitiveness. Recent research from Africa links investments in education, health, and nutrition to improved labor productivity. Although more research is needed, the evidence also demonstrates plausible pathways that link family planning to other key pillars of economic competitiveness such as labor efficiency, national infrastructures, and transparent institutions. Reduced fertility contributes to age-structure shifts that result in fewer dependents, creating the opportunity for countries to increase savings. Governments can, in turn, use those savings to make the social (health, nutrition, and education) and infrastructure investments necessary to build a strong workforce, promote a more equitable market environment, prepare for technological advances in the job market, and create the high-productivity jobs needed to reduce poverty and thrust the economy forward. Reduced fertility also translates into more stable population growth rates, fewer pressures on the job market, fewer unemployed youth, and as a consequence, an environment more conducive to cultivating strong democracies.

Enhancing Equity for Economic Development

Inclusive family planning programs reduce inequities between the rich and the poor, decreasing poverty and fostering inclusive economic growth.

Across SSA, national development policies and long-term strategies aim for the twin goals of rapid and inclusive economic growth. The continent has enjoyed a sustained period of rapid economic growth spurred by economic diversification and better fiscal policies. Moreover, as discussed earlier in this section, the region has made considerable progress in reducing poverty rates in the last two decades. Nevertheless, economic and social inequality persists.

The following section examines the role of family planning in reducing inequities in access to economic opportunity. It explores the current status of inequities in general across the region, and presents a new analysis of two fertility decline scenarios on the population age structure among the highest and lowest wealth groups of four countries. Earlier discussions in this report have already demonstrated the relationship between fertility, age structure, and dependency ratios. Historically, the wealthiest segment of the population has demanded and gained access to family planning earlier in the demographic transition. This is also true in Africa, where countries with growth in use of modern contraceptives are experiencing disparities between the wealthiest and poorest segments of the population.

Current Status of Inequities in Sub-Saharan Africa

Throughout Africa, access to medical care, reproductive health services, food security, education, and many other aspects of human well-being are marked by wide disparities. The wealthy receive the best schooling and health care services, while many of the poor simply do without. The poor education and health of those living in poverty in turn make it harder for them or their children to advance their economic position, perpetuating an intergenerational cycle of poverty.

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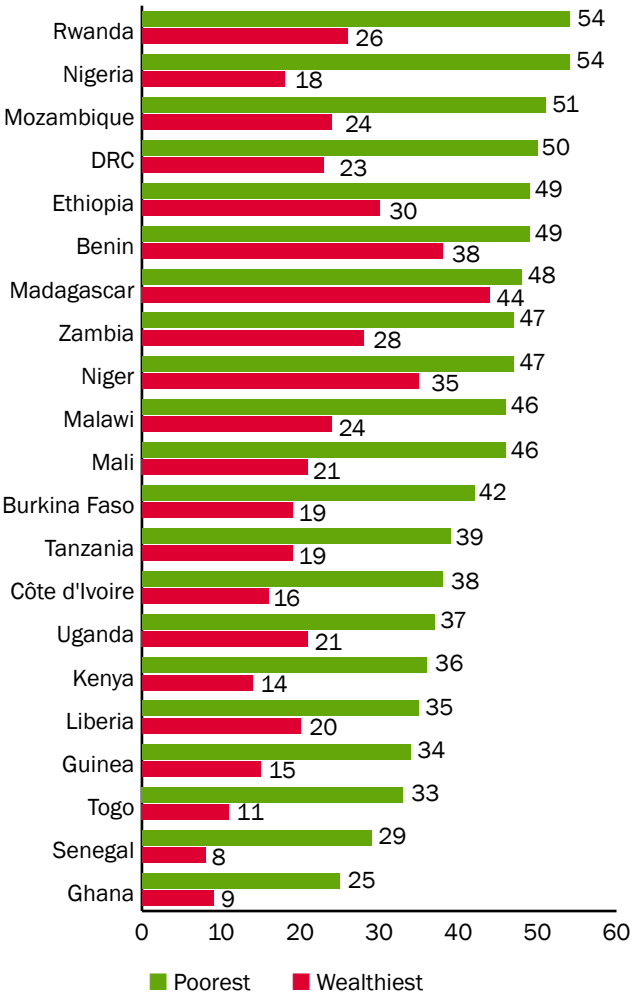
Among the 21 review countries, stark disparities exist among population groups with different income levels. Figures 12, 13, and 14 present three key indicators of health, nutrition, and education by the poorest and wealthiest segments of the population in the review countries. Wealth is determined by a wealth index that divides the population into five wealth groups (quintiles)—depicting the poorest 20 percent to the wealthiest 20 percent.

The gap between the wealthiest and poorest quintiles is an important measure of inequality. Figure 12 presents the inequality of children's

FIGURE 12

Percent of Children Stunted, Poorest and Wealthiest Quintiles



Source: ICF International, Demographic and Health Surveys.

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nutritional status in the region—in this case stunting levels—with the countries ordered by the percent of children stunted in the poorest quintiles (the green bars). The red bars show the percent of children stunted in the wealthiest quintile. Overall, the gaps are wide. In some countries, like Benin, Madagascar, and Niger, the gaps are smaller, but the percentage of children stunted for the wealthiest and poorest 20 percent of the population are both high.

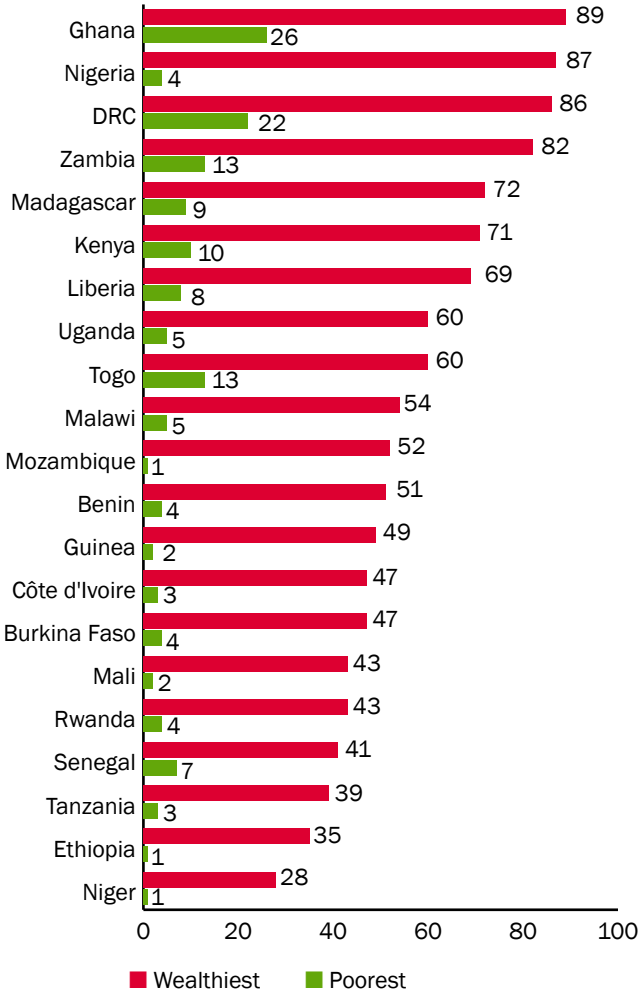
Figure 13 focuses on the percent of women with secondary or higher education in the poorest and wealthiest quintiles. There is a wide gap between the groups in the majority of countries, with 5 percent or less of the women in the poorest quintile attending secondary or higher education in several countries. Likewise, the poorest quintile of young women in each country are more likely to be pregnant or to have had their first child as a teenager, compared to teenagers in the wealthiest quintile (see Figure 14).

Reducing Future Inequities: Four Case Studies

Looking to the future, what can be done to reduce these stark differences? This section examines the current status of fertility in four countries in SSA and the potential role of family planning in reducing inequities. It explores the trajectory of fertility trends in these four countries and presents the impact of family planning on fertility and age structure. The countries included in the

FIGURE 13

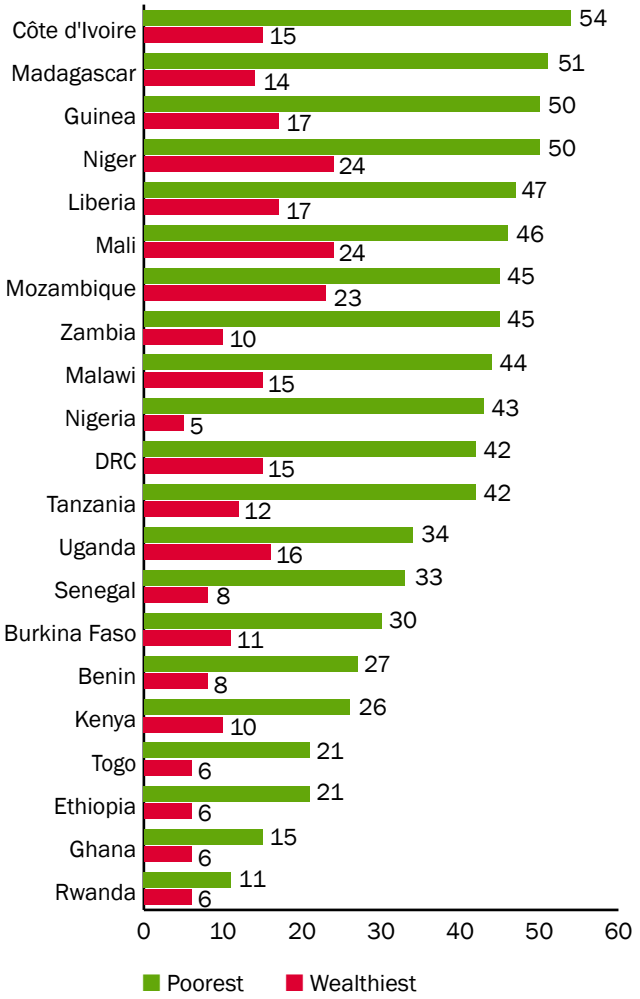
Percent of Women With Secondary or Higher Education, Wealthiest and Poorest Quintiles



Source: ICF International, Demographic and Health Surveys.

FIGURE 14

Percent of Teenagers Who Have Had a Child or Are Pregnant With the First Child, Poorest and Wealthiest Quintiles



Source: ICF International, Demographic and Health Surveys.

analysis—Rwanda, Kenya, Uganda, and Nigeria—represent variations in family planning services uptake during the last decade.

To demonstrate the age-structure changes associated with differential family planning performance and patterns of fertility decline among quintiles, two alternate scenarios of long-term fertility decline through 2050 for the poorest and wealthiest income quintiles have been constructed:

1. **Current rates of TFR decline continue.** In the first scenario, fertility decline continues at current rates, established on the basis of the rate between the last two DHS in each country. In countries where the TFR of the poorest quintile increased between the last two surveys, gradual decline was assumed to take place, based on earlier rates of decline that the country experienced.

2. **Rates of TFR decline accelerate and become more equitable.** In the second scenario, the richest quintile achieves replacement fertility by 2030 and the poorest quintile by 2035. Replacement level fertility is when couples have only enough children to replace themselves, or about 2 children per couple. Although these assumptions are very ambitious, the experiences of Rwanda between 2005 and 2010 and of Kenya between 2003 and 2014 demonstrate that rapid TFR decline can be achieved in just a few years.

The results for each country are presented comparing the two scenarios in terms of changes in age structure shown in age pyramids. A favorable age structure is defined as:

- Young dependent ages 0 to <15 comprise 30 percent or lower.
- Working ages 15 to 64 comprise 66 percent or higher.
- The median age is 25 years or older.

The demographic variables include changes in:

- Population in the poorest and wealthiest quintiles.
- TFR.
- mCPR.
- Total dependency ratio (TDR).
- Median ages.
- Proportion of persons in working ages and below working ages for each quintile.

For a complete summary of the methodology and a description of limitations of the analysis, see Appendix C.

RWANDA: Setting the Standard for Equitable Progress

Rwanda has achieved an unprecedented and equitable rate of progress in improving access to modern contraception and translating that progress into fertility decline.

Rwanda's rapid progress stands out in the region. The government's commitment to reducing fertility led to a strong family planning program that reached out to multiple sectors and groups. As a result, Rwanda experienced significant increases in modern contraceptive uptake across all wealth quintiles. In turn, those successes translated into a rapid decline in TFR from 6.1 in 2002 to 4.1 in 2014 that occurred relatively equitably across wealth quintiles (see Figure 1-A).[+]

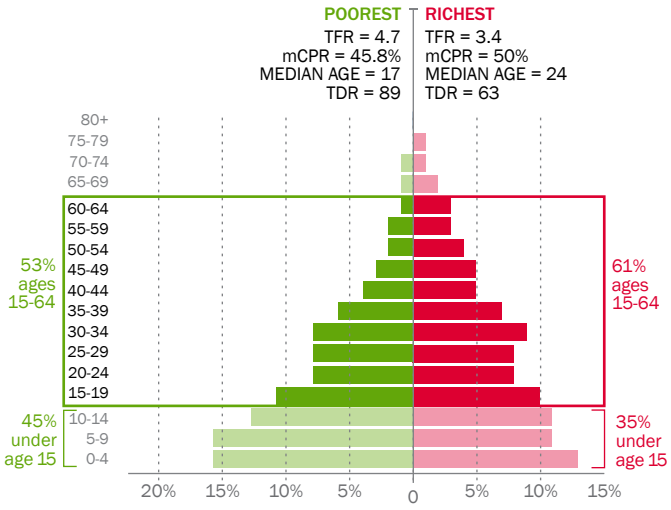
FIGURE 1-A

Total Fertility Rate (TFR) by Wealth Status in Rwanda

Figure 1-B shows that in 2015, the age structure of the wealthiest quintile (the red bars) is still predominantly young, with expanding cohorts towards the base of the pyramid. However, the proportion ages 0 to 14 years is approaching the ideal in which young dependents comprise 30 percent or less of the population. In the poorest quintile, the young dependents comprise 45 percent of the

FIGURE 1-B

Rwanda Age Structure (2015)

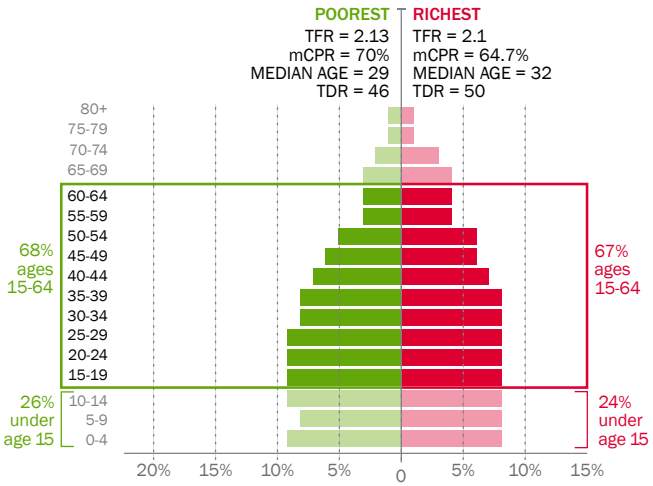


population, and while the TDR at 89 is still high, the proportion of the working-age population is large compared to the young dependent ages.

Rwanda's rapid and relatively equitable trends in fertility decline are expected to produce a favorable age structure in both quintiles, even under the scenario where current TFR trends continue to 2050 (see Figure 1-C). In this scenario, the poorest and wealthiest quintiles reach a similar

FIGURE 1-C

Rwanda (2050), Current TFR Decline



[+] The poorest and wealthiest quintiles comprise only 40 percent of the 2015 population of each case-study country. The quintile projections in this review are not forecasts of what the poorest or richest quintile will be in 2020, 2035, or 2050. Rather, the projections are intended to illustrate the demographic changes that the poorest quintile in 2015 could experience over time (up to 2050) compared to the richest quintile, based on already pronounced differences in 2015 TFRs (the initial year of the projections) between the poorest and the richest quintile.

proportion of the population under age 15, as well as similar proportions of the working age populations—both above the ideal 66 percent.

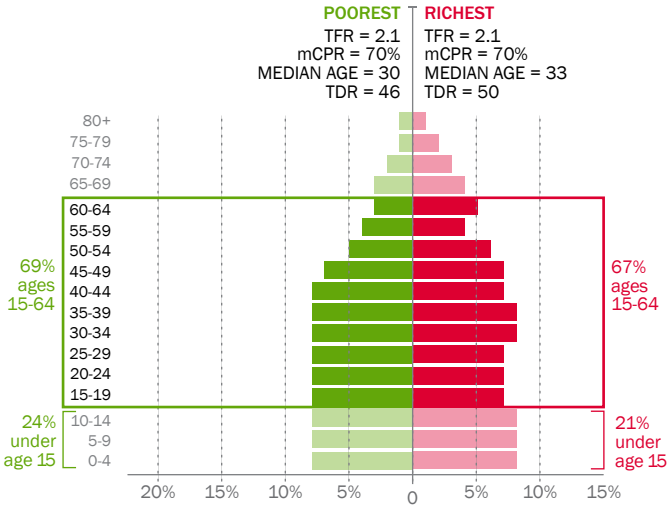
In the second scenario (see Figure 1-D), assuming an accelerated TFR decline, the percent of the population under 15 continues to fall in both the poorest and wealthiest quintiles, and the median ages in both quintiles are just three years apart, at 30 (poorest) and 33 (wealthiest) respectively. This indicates that the population in each quintile is maturing, or becoming increasingly dominated by populations in the middle age groups relatively equitably.

Rwanda's relatively equitable fertility trends are expected to produce similar demographic indicators between wealth quintiles. For example, the median age of the poorest quintile will be about 30 by 2050 under either scenario. The population in the working ages for the poorest quintile will reach 3.65 million assuming current rates of fertility decline compared to 3.47 million under the accelerated fertility scenario (see Table 1-A). Moreover, in the poorest quintile, the working-age population will be two times the size of the dependent population in either scenario; this implies greater potential for increased economic productivity and savings accumulation as well as greater resources to improve the quality of healthcare and education.

In 2005, Rwanda had one of the highest rates of economic inequality in SSA, despite rapid economic growth of around five percent annually since 2000. In 2008, Rwanda's second Poverty Reduction Strategy specifically highlighted reductions in total fertility that could be achieved by meeting the unmet need for family planning and the potential effect on poverty reduction.[58] In 2012, Rwanda's third Integrated

FIGURE 1-D

Rwanda (2050), Accelerated TFR Decline



Household Living Conditions Survey showed both significant poverty reduction and a decrease in economic inequality, leading many economists to praise the country for achieving broad-based economic growth.[59] Notably, the trend from highly inequitable to broad-based economic growth has coincided with the country's equitable fertility decline, although further research is needed to ascertain the specific contribution of fertility change to Rwanda's inclusive economic growth trend. In addition, when comparing Rwanda to other countries' Gini-coefficients—a measure intended to represent the income distribution of a nation's residents—Rwanda has one of the highest Gini coefficients in the East African region, and high compared to most counties in SSA. This signals an ongoing challenge for the country to achieve a more equitable income distribution.

TABLE 1-A

Demographic Indicators of the Poorest and Richest Quintiles Under Two TFR Scenarios, Rwanda, 2015–2050*

Population indicators, Rwanda	Assuming continuing past trends (slow TFR decline)						Assuming accelerated TFR decline					
	Poorest Quintile			Richest Quintile			Poorest Quintile			Richest Quintile		
	2015	2035	2050	2015	2035	2050	2015	2035	2050	2015	2035	2050
Projected population (in millions)	2.77	4.37	5.35	2.63	3.57	4.13	2.77	4.18	5.07	2.63	3.41	3.90
Population in young dependent ages 0 to 14 (in millions)	1.24	1.46	1.37	0.91	0.98	0.97	1.24	1.28	1.27	0.91	0.85	0.91
Population in working ages 15 to 64 (in millions)	1.47	2.77	3.65	1.62	2.36	2.76	1.47	2.76	3.47	1.62	2.33	2.60

*Quintile projections were estimated using Avenir Health's Spectrum models, DHS wealth quintile data, and the UN's 2015 population projections.

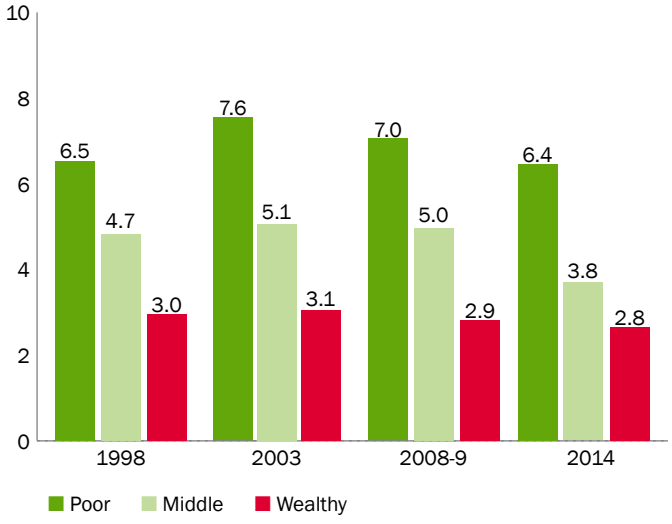
KENYA: Correcting the Course in Equitable Fertility Decline

Kenya demonstrates that it is possible to overcome both historical contraceptive stagnation and inequitable trends in fertility decline.

Kenya has achieved steady declines in TFR, from 4.9 in 2003 to 3.9 in 2014. However, until very recently, progress in expanding access to modern contraceptives was highly inequitable. As such, fertility decline has not been equitable: The TFRs of the wealthiest and poorest quintiles are 2.8 and 6.4 respectively, a fertility differential of 3.6 (see Figure 2-A). Over the last decade, the government of Kenya recognized the emerging, deeply inequitable pattern of fertility decline and has adopted measures to alter its course.

FIGURE 2-A

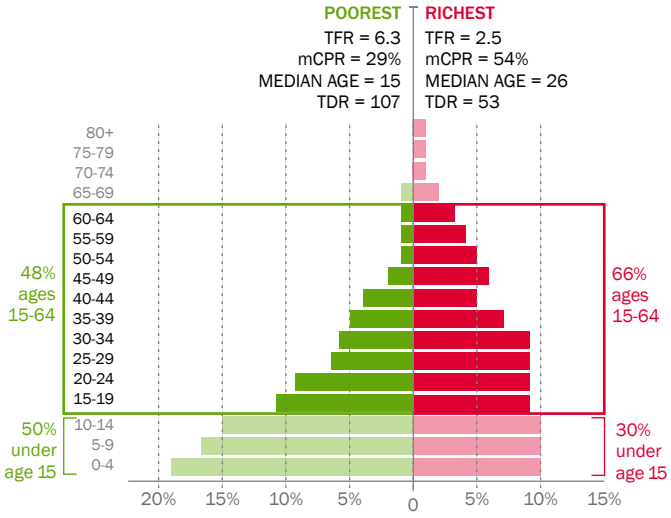
Total Fertility Rate (TFR) by Wealth Status in Kenya



As seen in Figure 2-B, the TDR of the poorest quintile in Kenya (107) indicates that there are many more young dependents than working-age adults. The age structure of the poor remains broad-based, with expanding cohorts towards the bottom of the pyramid. By contrast, Kenya's wealthiest quintile is experiencing progress towards a favorable age structure, with growing proportions in the middle age groups of the pyramid, and a narrowing of the base.

FIGURE 2-B

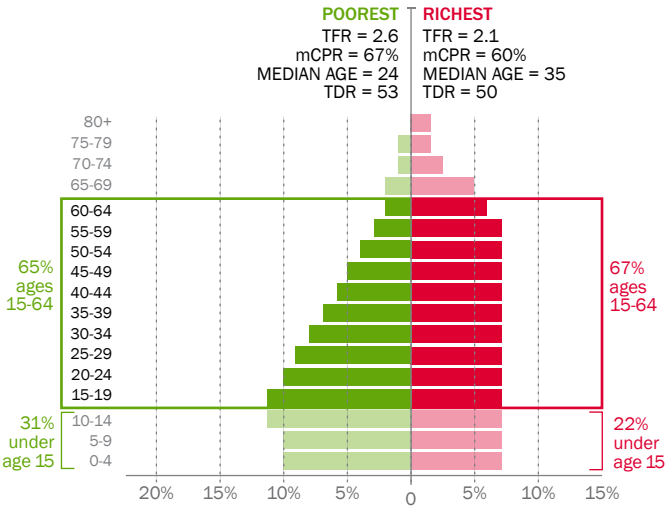
Kenya Age Structure (2015)



If current fertility trends persist, the wealthiest quintile will achieve a favorable age structure by 2050, with 22 percent of the population in the young dependent ages and 67 percent in the working ages by 2050 (see Figure 2-C).

FIGURE 2-C

Kenya (2050), Current TFR Decline



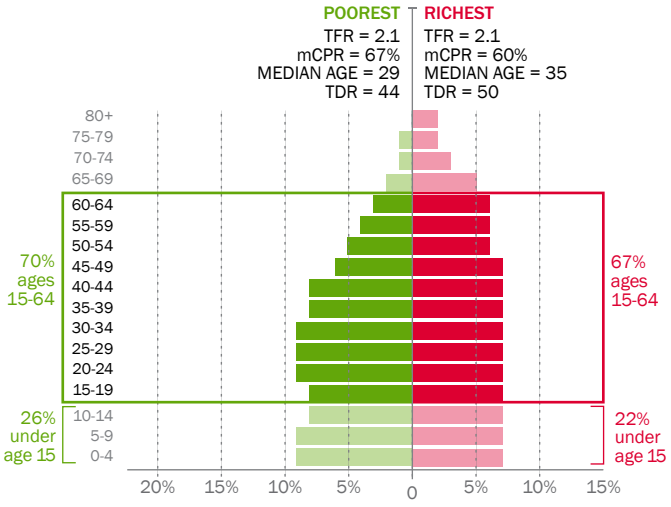
The poorest quintile is also expected to progress towards a more favorable age structure, but does not reach the ideal by 2050. As a result, the age pyramids of the wealthiest and poorest quintiles are asymmetrical. As shown in Figure 2-C, as young dependency in the wealthiest quintile shrinks, the population becomes equally distributed across age brackets from age 0 to age 64; at the same time, the population in the poorest quintile expands in the adolescent and young-adult ages (ages 10 to 24). Of note, however, is that the total dependency ratio for the poor significantly shrinks; it is cut by half from 107 in 2015 to 53. In addition, there is an 11-year difference between the median age of the wealthiest and poorest quintiles.

Assuming accelerated fertility decline as shown in Figure 2-D, both quintiles have about two-thirds or more of the populations in the working ages in 2050, with the poorest quintile at 70 percent compared to 67 percent in the wealthiest quintile. The dependency ratio for the poorest is lower than for the wealthy at 44 and 50 respectively, and the gap in the median ages of the wealthiest and poorest quintile is narrowed to six years.

Summary population figures in Table 2-A suggest that the total population of the poorest quintile will double by 2035 if TFR trends continue. Such rapid population growth is a concern in Kenya, which is already classified as water-scarce and has seen dramatic increases in the population requiring emergency food aid (see Building Resilience, page 47). In the accelerated scenario, the total population in the poorest quintile in 2050 will be 21 percent lower than if TFR trends continue. In addition, since the median age would increase to more than 25 in both quintiles, Kenya could potentially reduce its vulnerability to political instability (see Building a Strong National Infrastructure, page 29).

FIGURE 2-D

Kenya (2050), Accelerated TFR Decline



The projections for Kenya illustrate that it is possible for a country to alter its demographic course and significantly reduce the fertility differential between the wealthiest and poorest quintile. In 2007, Kenya launched its ambitious National Reproductive Health Policy: Enhancing Reproductive Health Status for All Kenyans, with the specific goal of reducing "inequalities in health resource allocation and improving access to reproductive health (RH) services by poor 'hard to reach' and vulnerable groups."[60]

TABLE 2-A

Demographic Indicators of the Poorest and Richest Quintiles Under Two TFR Scenarios, Kenya, 2015–2050*

Population indicators, Kenya	Assuming continuing past trends (slow TFR decline)						Assuming accelerated TFR decline					
	Poorest Quintile			Richest Quintile			Poorest Quintile			Richest Quintile		
	2015	2035	2050	2015	2035	2050	2015	2035	2050	2015	2035	2050
Projected population (in millions)	11 .51	21 .45	28 .81	10 .06	12 .48	13 .75	11 .51	19 .14	23 .84	10 .06	12 .41	13 .65
Population in young dependent ages 0 to 14 (in millions)	5 .81	8 .70	8 .85	3 .01	2 .97	2 .98	5 .80	6 .50	6 .15	3 .01	2 .91	2 .95
Population in working ages 15 to 64 (in millions)	5 .55	12 .40	18 .85	6 .60	8 .43	9 .16	5 .55	12 .29	16 .58	6 .60	8 .42	9 .09

*Quintile projections were estimated using Avenir Health's Spectrum models, DHS wealth quintile data, and the UN's 2015 population projections.

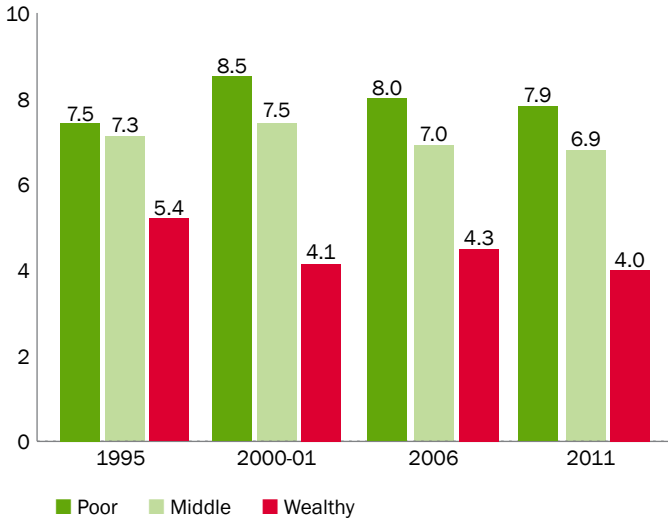
UGANDA: Delaying Progress as a Result of Inequitable Fertility Decline

Uganda demonstrates that delayed, inequitable progress in fertility decline can have adverse consequences on a country's demographic trajectory.

Uganda's recent progress (since 2011) in expanding access to modern contraception is encouraging. However, these recent increases in mCPR have not yet manifested themselves in significant fertility decline: TFR stands at 6.1 children per woman, one of the highest rates in the region. With a TFR of 4 in the wealthiest quintile and 7.9 in the poorest quintile, Uganda has the largest fertility differential of the four countries at 3.9 children per woman (see Figure 3-A).

FIGURE 3-A

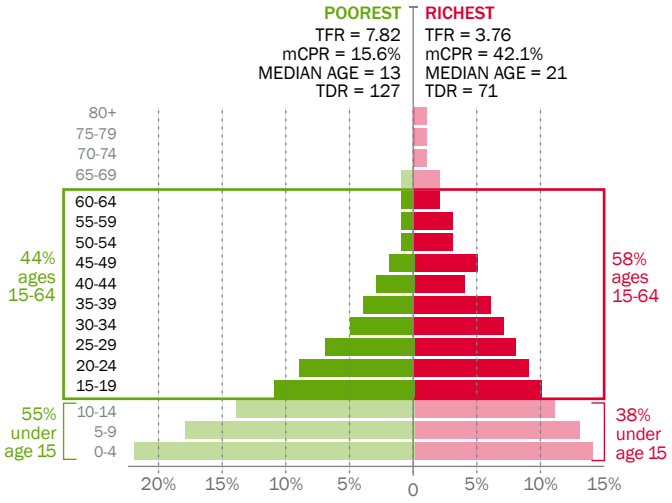
Total Fertility Rate (TFR) by Wealth Status in Uganda



Uganda has made limited progress towards a favorable age structure, even in the wealthiest quintile (see Figure 3-B). With a current TDR of 127, Uganda's poorest quintile has the highest TDR of the four countries, with more than half of the population under age 15 (55 percent) and only 44 percent of the population in the working ages. Similarly, with a median age of 13 years, the poorest quintile in Uganda is eight years younger than the wealthiest quintile, and has the youngest median age of all four countries in this study.

FIGURE 3-B

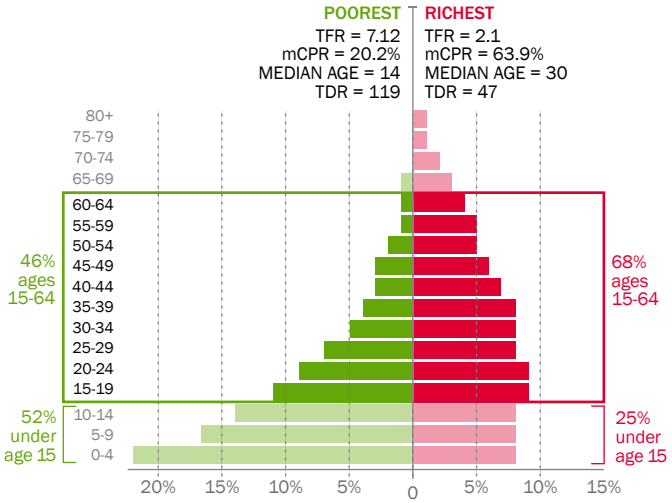
Uganda Age Structure (2015)



If the current rates of fertility decline continue, Uganda will have asymmetrical population pyramids in the poorest and wealthiest quintiles in 2050 (see Figure 3-C). The poorest quintile has a broad-based age structure, with 22 percent of

FIGURE 3-C

Uganda (2050), Current TFR Decline



the population in the 0 to 4 age bracket and more than half of the population under age 15. By contrast, the age structure of the wealthiest quintile has a constricted base and is nearly flat (indicating an even population distribution across age cohorts). The median age in the poorest quintile remains alarmingly low at 14 years of age compared to 30 years in the richest quintile.

In the accelerated scenario, the age structure is fairly symmetrical between quintiles (see Figure 3-D). The median age for the poorest quintile has increased to age 28, and is only four years younger than for the wealthiest quintile. Both quintiles experience a bulge in the most productive working ages, a key opportunity to maximize the benefits of a demographic dividend.

The demographic outcomes of the future trends in Uganda are perhaps the most alarming (see Table 3-A). At current rates of fertility decline, the population of the poorest quintile will nearly triple by 2035, and then double again by 2050. Moreover, the number of dependents in the poorest quintile will remain larger than the working-age population even beyond 2050. In the accelerated scenario, the total population of the poorest quintile in 2050 would be halved and the working age population would exceed the number of dependents by 2035.

Uganda faces an urgent need to rapidly improve family planning outreach and access for the poor. Ideal family size among the poorest is higher than the wealthiest (5.8 and 3.3 respectively), but it is also two children less than the current TFR, indicating that poor women would prefer to have fewer children. If Uganda is to avert continued disparities between the poorest and the wealthiest, with continued high fertility and rapid population growth in the poorest quintile, it must target disparities in access to family planning.

In committing to the FP2020 Global Partnership, the Government of Uganda pledged to improve health financing and develop a health insurance plan for the country, as well as promote voucher programs as a form of demand-side financing to increase the use of family planning and safe motherhood services among the poor. The Government also plans to implement its FP2020 Action Plan to address family planning regional disparities and inequities through training, capacity-building, community-based services, and interventions targeting young people and postpartum women.

FIGURE 3-D

Uganda (2050), Accelerated TFR Decline

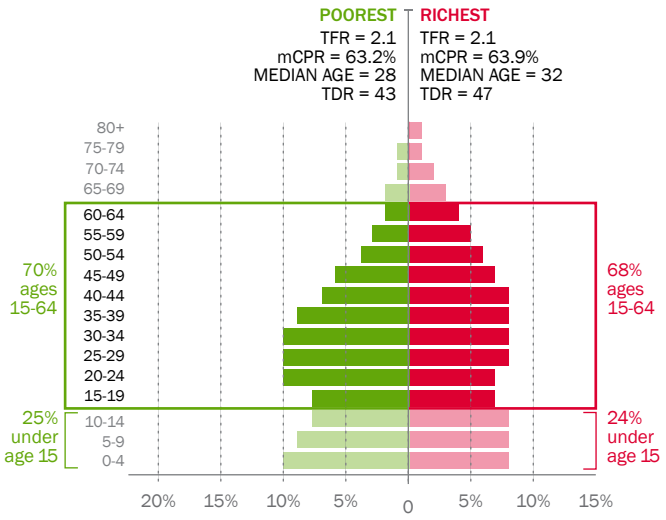


TABLE 3-A

Demographic Indicators of the Poorest and Richest Quintiles Under Two TFR Scenarios, Uganda, 2015–2050*

Population indicators, Uganda	Assuming continuing past trends (slow TFR decline)						Assuming accelerated TFR decline					
	Poorest Quintile			Richest Quintile			Poorest Quintile			Richest Quintile		
	2015	2035	2050	2015	2035	2050	2015	2035	2050	2015	2035	2050
Projected population (in millions)	9 .40	23 .98	48 .09	8 .59	12 .57	15 .04	9 .27	17 .90	20 .99	8 .56	11 .68	13 .71
Population in young dependent ages 0 to 14 (in millions)	5 .13	12 .84	25 .41	3 .25	3 .87	3 .72	5 .00	6 .03	5 .63	3 .22	3 .10	3 .28
Population in working ages 15 to 64 (in millions)	4 .14	10 .88	21 .94	5 .02	8 .02	10 .22	4 .14	10 .24	14 .63	3 .28	7 .90	9 .34

*Quintile projections were estimated using Avenir Health's Spectrum models, DHS wealth quintile data, and the UN's 2015 population projections.

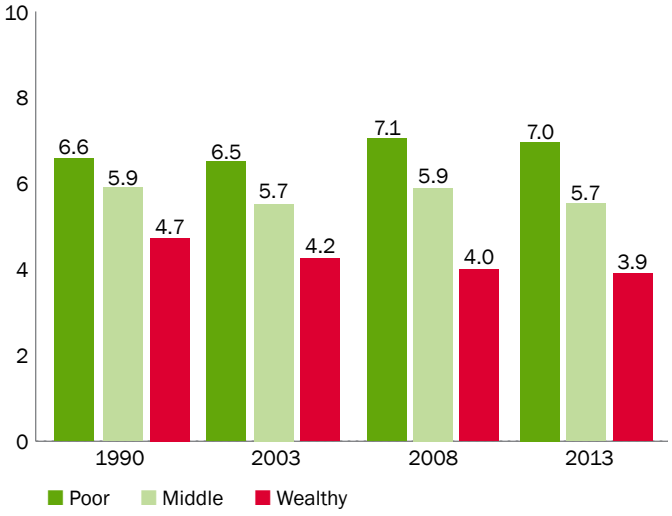
NIGERIA: Stagnancy and Inequity

In Nigeria, modern contraceptive use and total fertility across the wealth quintiles have been practically stagnant since 1990.

Nigeria has a high TFR of 5.5 that is unchanged since 2003. The TFRs of the poorest and wealthiest quintiles are 7 and 3.9 respectively, resulting in a three-child fertility differential (see Figure 4-A).

FIGURE 4-A

Total Fertility Rate (TFR) by Wealth Status in Nigeria



Nigeria's history of relatively high fertility levels in both the poorest and wealthiest quintiles are reflected in the age pyramid for 2015, with high dependency in both quintiles (see Figure 4-B). However, the richest quintile shows small signs of maturation, with the proportion of the population under the age of 15 approaching 30 percent. The median age of the wealthiest quintile at 24 years has almost reached the favorable median age of 25 or higher, while the median age of the poorest quintile is low at 16 years.

As shown in Figure 4-C, if trends persist into the future, neither quintile will achieve a favorable age structure by 2050. The proportion of the population under age 15 will be significantly higher (47 percent) for the poorest quintile than the wealthiest, and will have a high TDR of 92 compared to 63 in the wealthiest quintile. The median ages of the wealthiest (24) and poorest quintiles (17) reflect very slow progress toward significant fertility decline and aging of the population.

FIGURE 4-B

Nigeria Age Structure (2015)

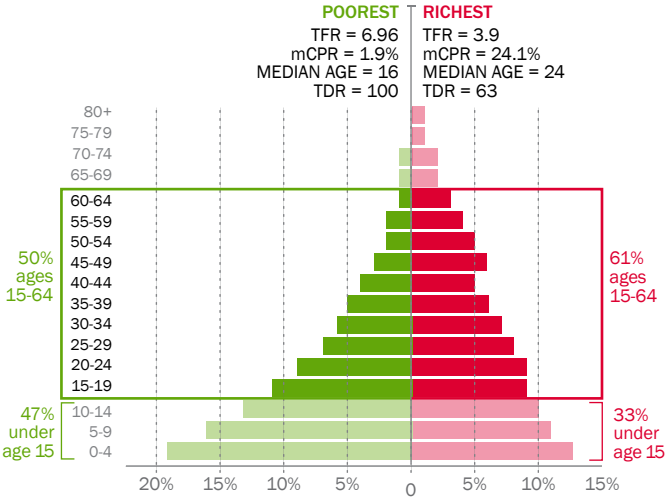
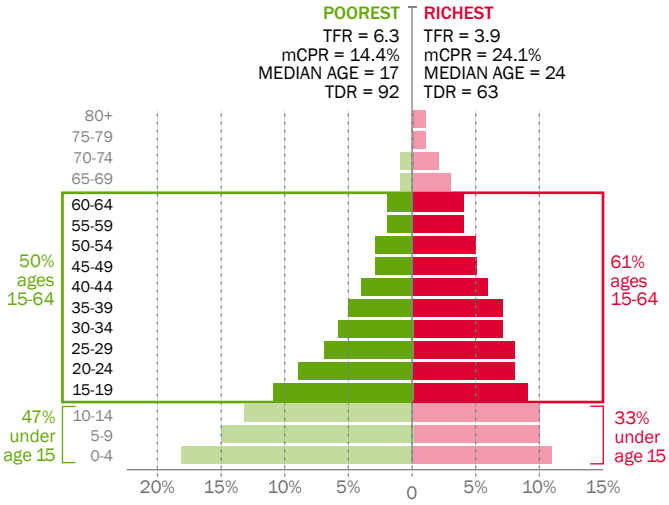


FIGURE 4-C

Nigeria (2050), Current TFR Decline



If fertility declines in each quintile accelerate significantly, both quintiles could attain more favorable age structures by 2050 (see Figure 4-D). Both quintiles would experience a bulge in the most productive ages (ages 15 to 64). The median age gap for the poorest would be only four years less than the wealthiest, and both quintiles would increase to 30 and 34 respectively—a favorable median age.

As shown in Table 4-A, if fertility trends persist in Nigeria, the population of the poorest quintile in 2015 (39 million) will nearly double by 2035 and be close to 120 million by 2050. The number of young dependents will be only a little less than the working-age population (an estimated 54 million and 62 million respectively).

In the accelerated scenario, the total population in the poorest quintile will be 65 million in 2050, certainly a sizable number, but much smaller than the projected figure of 120 million under the current trend scenario. Additionally, the median age will be 30 in the poorest quintile, with the population in the young dependent ages down to a third of the number of working-age adults, a favorable ratio for increased savings and investment.

Rapid population growth represents a serious challenge in both the lowest and highest wealth quintiles in Nigeria. Cognizant of the numerous challenges brought about by persistently high fertility rates and inequality, the Government of Nigeria's commitments for the Global FP2020 Partnership include implementing the National Strategic Health Development Plan, institutionalizing support for primary health services, and meeting or exceeding its Abuja Declaration health financing commitments. The Government also pledged to improve equity and access to family planning for women in the lowest socioeconomic statuses, promoting policy formulation and action that support maternal and child health at all levels, and partnering with the private sector, civil society, traditional and religious institutions, and development partners.

FIGURE 4-D

Nigeria (2050), Accelerated Fertility Decline

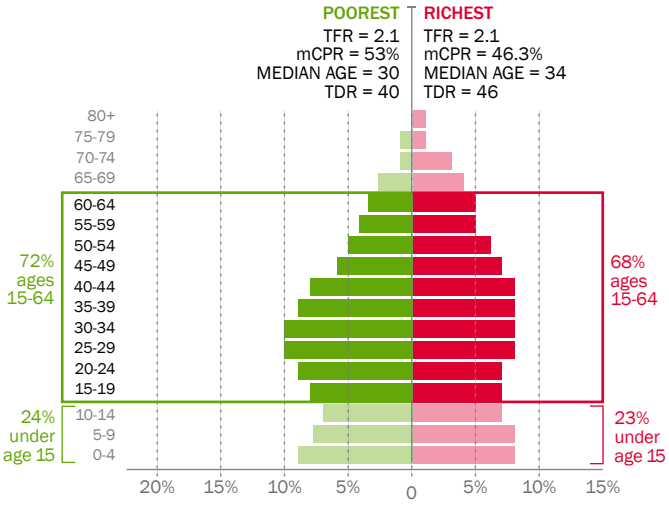


TABLE 4-A

Demographic Indicators of the Poorest and Richest Quintiles Under Two TFR Scenarios, Nigeria, 2015–2050*

Population indicators, Nigeria	Assuming continuing past trends (slow TFR decline)						Assuming accelerated TFR decline					
	Poorest Quintile			Richest Quintile			Poorest Quintile			Richest Quintile		
	2015	2035	2050	2015	2035	2050	2015	2035	2050	2015	2035	2050
Projected population (in millions)	38 .78	73 .29	118 .72	37 .88	52 .37	65 .55	38 .78	56 .98	64 .86	37 .82	46 .13	50 .87
Population in young dependent ages 0 to 14 (in millions)	18 .41	33 .77	53 .99	12 .63	16 .73	20 .10	18 .41	18 .22	15 .50	12 .56	11 .11	11 .53
Population in working ages 15 to 64 (in millions)	19 .40	38 .07	61 .79	23 .20	32 .04	40 .86	19 .40	37 .30	46 .42	23 .20	31 .42	34 .75

*Quintile projections were estimated using Avenir Health's Spectrum models, DHS wealth quintile data, and the UN's 2015 population projections.

Conclusion

This analysis suggests that continued high fertility in the poorest quintile in most countries in SSA creates high dependency ratios, thereby compromising the ability of the poor to access economic opportunities. High fertility has the potential to lock the poor into a cycle of poverty for generations. In contrast, the wealthiest quintile has experienced faster historical fertility declines that have produced low dependency, creating greater opportunity for investments in the health and education of young dependents as well as savings and capital accumulation (cashing in on the demographic dividend). If fertility decline is not accelerated across wealth quintiles, the resulting inequities could limit the realization of economic benefits for the country as a whole. Family planning, and its role in reducing fertility, should be considered a critical element of inclusive and sustained economic growth in Africa.

Building Resilience

Voluntary family planning is an important tool for strengthening resilience to multiple interrelated environmental shocks and stressors.

In 2014, international donors spent US$25 billion responding to humanitarian needs. Sixty-six percent of this official humanitarian assistance went to countries suffering protracted crises and categorized as long-term recipients, meaning they regularly receive a high share of humanitarian assistance year after year.[61] Several of these are SSA countries—including many of the 21 countries covered in this review. Nearly 220 million people in SSA, or almost one in every four inhabitants, lack adequate food for a healthy and active life despite great progress in reducing poverty and hunger over the last 20 years.[62] Many more remain vulnerable to food insecurity, as rising food prices and severe drought push record numbers of people into poverty and hunger. In 2011, severe drought in the Horn of Africa placed 13 million people at risk of food insecurity. Today, just five years later, the region is again facing a food security crisis. [63]

To avert these recurring crises, the international development community recently shifted its approach and is now working to link the development and humanitarian agendas more closely to improve populations' abilities to cope with crises and build resilience. USAID defines resilience as "the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth."[64]

Resilience is strengthened by both reducing chronic vulnerabilities—including rapid population growth that hinder humans and economic development—and increasing vulnerable populations' ability to respond to shocks. Strengthening peoples' ability to cope is especially important for the very poor whose livelihoods are dependent on natural resources. Rapid population

growth (particularly in highly vulnerable regions like the Horn and the Sahel) increases exposure to environmental shocks by placing further strain on already limited resources. Research shows that the provision of voluntary family planning reduces unintended pregnancies, leading to multiple health, education, and economic benefits for women and their households—all of which could potentially reduce vulnerability to shocks and build resilience (see Enhancing Labor Productivity).[65]

The confluence of these population and environment trends are daunting for much of SSA. For example, in the Sahel, a region that is already experiencing the adverse consequences of climate change, the population has grown from 30 million people in 1950 to 135 million today and is expected to increase to more than 300 million people by 2050.[66] Most of the continent is experiencing equally rapid population growth, demonstrated in Table 4. DRC is currently the third most populous

TABLE 4

Population Growth Projections and Doubling Times for 21 Sub-Saharan African Countries

Progress Categories and Countries	Population in 2015 (in millions)	Annual Growth Rate (2010-2015)	Doubling Time (in years)	Population in 2100 (medium variant)
Rapid Progress (annual increase > 2 percent) and/or mCPR ≥ 40% or more				
Ethiopia (2011-2014)*	99	2.53	27.4	243
Kenya (2008/2009-2014)	46	2.65	26.2	157
Madagascar (2003/2004-2008/2009)	24	2.79	24.8	105
Malawi (2010/2015-2016)*	17	3.06	22.7	87
Rwanda (2010-2014/2015)*	12	2.41	28.8	26
Senegal (2010/2011-2013/2014)**	15	3.1	22.4	75
Zambia (2007-2013/2014)	16	3.05	22.7	105
Encouraging Progress (annual increase > 1 & ≤ 2 percent)				
Liberia (2007-2013)	5	2.58	26.9	16
Niger (2006-2012)	20	4	17.3	209
Tanzania (2004/2005-2010)	53	3.16	21.9	299
Uganda (2006-2011)	39	3.27	22.2	203
Slow Progress (annual increase ≥ 0.5 & ≤ 1)				
Burkina Faso (2003-2010)	18	2.94	23.6	81
Ghana (2008-2014)	27	2.39	29	73
Mali (2006-2012/2013)	18	2.98	23.3	93
Togo (1998-2013/2014)	7	2.67	26	28
No Progress (annual increase < 0.5)				
Benin (2006-2011/2012)	11	2.69	25.8	36
Congo, Democratic Republic (2007-2013/2014)	77	3.17	21.9	389
Côte d'Ivoire (1998/1999-2011/2012)	23	2.4	28.9	101
Guinea (2005-2012)	13	2.71	25.6	49
Mozambique (2003-2011)	28	2.8	24.8	128
Nigeria (2008-2013)	182	2.67	26	752

*Preliminary DHS results I **Continuous DHS survey I +Indicates mCPR > 40% in most recent survey

country in Africa with 77 million people. By 2035, DRC's population will double (to around 145 million) in just 22 years. Nigeria's population growth is just as dramatic. Already the most populous SSA country with an estimated 182 million people, by 2035 the population will double to more than 360 million, and will continue growing to reach more than three-quarters of a billion people (752 million) by 2100.

Previous sections of this review have explored the ways in which population growth and demographics affect economic growth through competitiveness and equity. This section focuses on the ways that population dynamics and family planning are related to and interact with environmental shocks and stresses such as climate change, food insecurity, water scarcity, loss of arable land, and urbanization, and how family planning investments can aid in building resilience to help people counter these shocks.

Climate Change

Climate change has brought and will continue to bring changes in temperature and precipitation patterns as well as more extreme weather events, with implications for agricultural productivity, human health, and disaster risk management across SSA. The December 2015 Conference of Parties (COP) Paris Agreement seeks to limit warming to below 2°C above preindustrial levels, and pursue efforts to limit the temperature increase to 1.5°C to avoid the most catastrophic impacts of climate change—and yet the average global temperatures for the first three months of 2016 have almost reached the 1.5°C threshold, climbing to 1.48°C.[67,68,69]

The Africa chapter of the 2014 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report stated that "Africa as a whole is one of the most vulnerable continents to climate change due to its high exposure

and low adaptive capacity," noting that temperatures are projected to rise faster in Africa than the rest of the globe through the end of this century. Across SSA, climate change is already having short- and long-term impacts on marine, freshwater, and terrestrial ecosystems, with links to food production, livestock, livelihoods, health (vector- and water-borne diseases), floods, and droughts.[70] Moreover, the UN Environment Program estimates that climate change will lead to a 2 percent to 4 percent annual loss in GDP in Africa by 2040.[71]

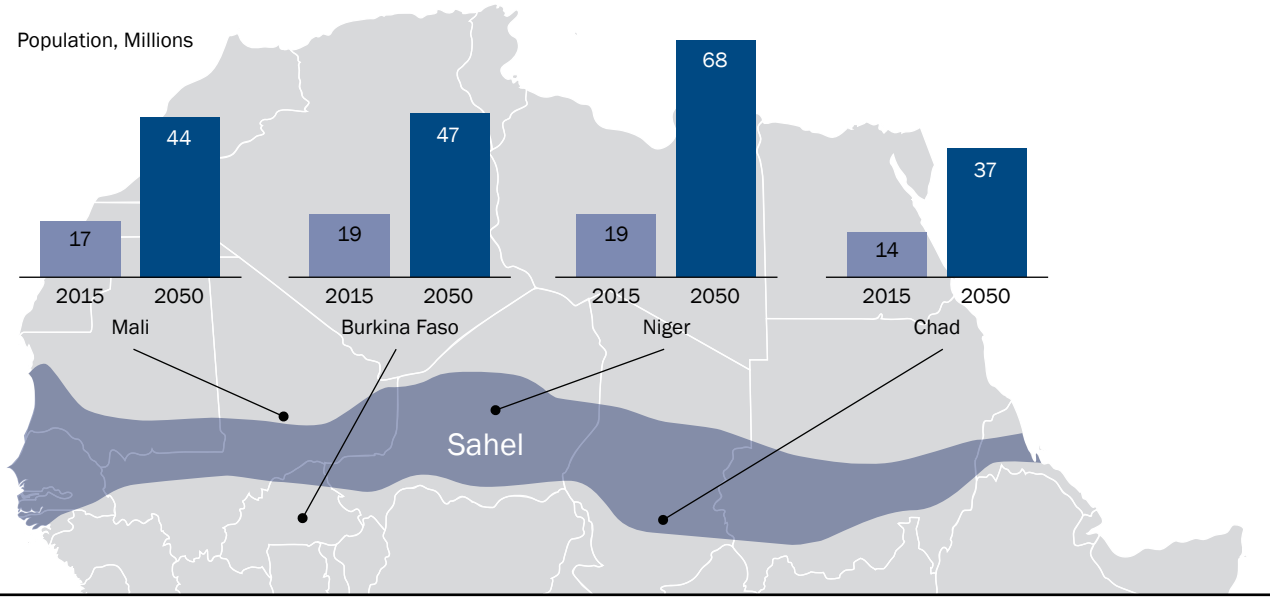
Although climate change affects all countries in SSA, no region better exemplifies the need for climate adaptation than the Sahel, where a rapidly growing population, in tandem with a changing climate in an already arid region, translates into a far greater number of people exposed to more frequent droughts and famine. In countries such as Burkina Faso, Chad, Mali, and Niger, where the majority of the population depends on agriculture for their livelihood and where the population is expected to more than double by 2050, improved family planning programs could go a long way toward slowing the pace of population growth and building resilience (see Map 2).

An increase in greenhouse gases in our atmosphere contributes to global warming and climate change. A greenhouse gas is any gaseous compound in the atmosphere that is capable of absorbing infrared radiation, thereby trapping and holding heat.[72] By increasing the heat in the atmosphere, greenhouse gases are responsible for the greenhouse effect, which ultimately leads to global warming. Among the greenhouse gases emitted by human activities, one of the most significant is carbon dioxide (CO2). Primary sources of CO2 include fossil fuel use, direct human-induced impacts on forestry and other land use such as through deforestation, land clearing for agriculture, and degradation of soils.[73] High population growth generally results in increasing greenhouse gas emissions.

Globally, if the fertility came down by as much as 0.6 to 0.7 births per woman, the resulting slower population growth could have substantial long-term effects on reducing total global CO2 emissions.[74] Reducing fertility could lead to changes in global emissions of CO2 by about 15 percent by 2050 and 40 percent to 60 percent by 2100.[75] Thus, policies that slow population

MAP 2

Sahelian Countries Where Family Planning Could Build Resilience



Source: Jason Bremner, et al., *Building Resilience Through Family Planning : A Transformative Approach for Women, Families, and Communities*, Population Reference Bureau, Washington DC., August, 2015.

growth—through interventions such as family planning programs—could generate climate-related as well as health benefits.

At the Paris COP, countries committed to policy actions to reduce their carbon emissions and prevent the worst impacts of climate change. In exploring the various strategies to meet these ambitious commitments, scientists and governments have made the connection at the international level between population growth and global carbon emissions. The IPCC in its 2014 Fifth Assessment Report included strong language on the connections between population growth and climate change and mentioned the benefits of voluntary family planning services at the global level in limiting future emissions.[76]

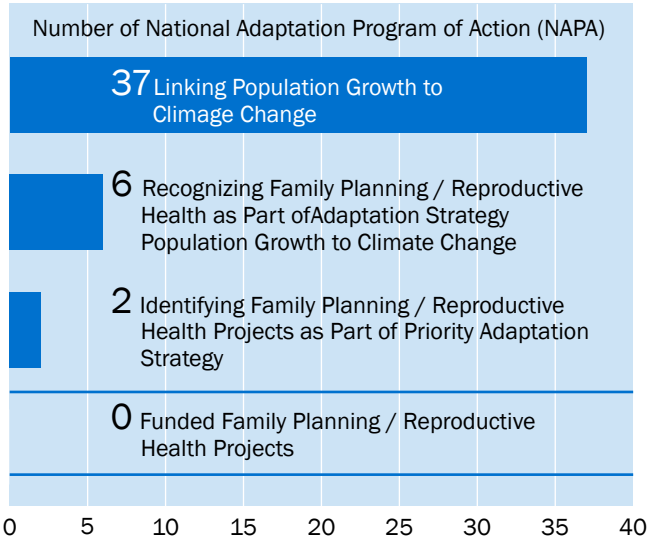
At the national level, countries are also linking population growth and climate change. For example, 37 of the 40 National Adaptation Programs of Action (NAPA) plans for immediate climate adaptation activities produced by the governments of least-developed countries identified population growth as a factor that exacerbates climate change and vulnerability.[77] Despite this recognition, none of the NAPA activities contained programs that address population dynamics through voluntary family planning (see Figure 15).

Food Security

Food security is achieved when all people at all times have both the physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life.[78] Population growth has a dual impact on food security, increasing demand for food while simultaneously reducing the capacity to produce food through reduced availability of arable land per capita. A recent report by the Food and Agriculture Organization projects that by 2050, population and economic growth will result in a doubling of demand for food globally.[79] In response to changes in consumption and population growth, agricultural outputs will need to increase by an estimated 70 percent by 2050 to ensure an adequate food supply. [80,81] In Africa, population growth has outpaced food production, and per capita food availability has decreased from the 1970s to the present.[82]

FIGURE 15

Napa's Characterization of Population, Family Planning/ Reproductive Health, and Climate Change



Source: Clive Mutunga and Karen Hardee, "Population and Reproductive Health in National Adaptation Programmes of Action (NAPAs) for Climate Change," Population Action International Working Paper, 2009.

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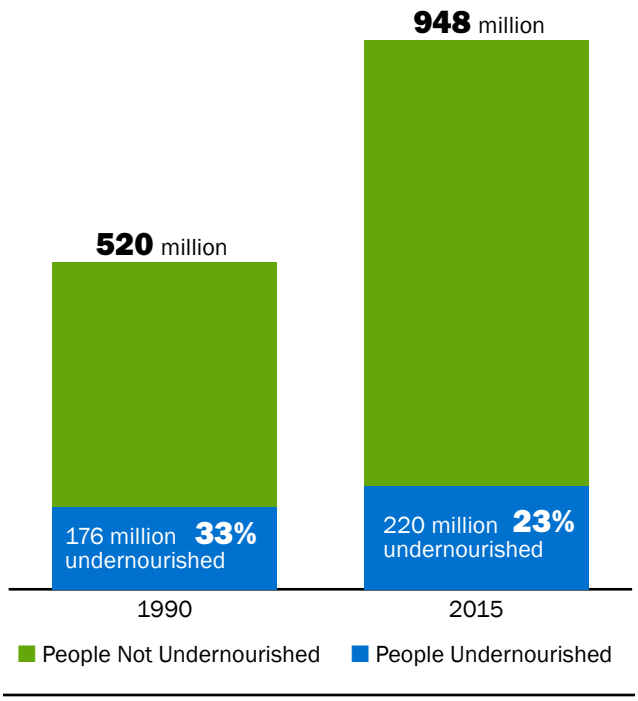
Between 1990 and 2015, the prevalence of undernourished people in SSA declined from 33 percent to 23 percent. However, in terms of absolute numbers, there has actually been an increase in the number of undernourished people from 176 million in 1990 to 220 million in 2015. Thus, today there are 44 million more undernourished people in SSA than there were at the onset of the Millennium Development Goals (see Figure 16).[83] Similarly, there are more children under age 5 who are underweight in SSA today than in 1990, largely due to high fertility, population growth, and the fact that the region now has approximately 75 percent more children under age 5 than it did in 1990.[84,85]

Across SSA, 98 percent of agriculture remains rainfed, placing it at great risk due to rainfall variability or extreme weather. A recent assessment concluded there is high confidence that climate change will exacerbate the vulnerability of agricultural systems, particularly in semi-arid areas, and the long-term risks to food production.[86] Thus, despite substantial investments in livelihood-based approaches for managing food production risks, current adaptations will be insufficient for managing risks from long-term climate change, which will be variable across regions and farming system types.[87]

As noted above, climate change is also reducing food security (see Box 7). A Population Action International report on *Population Dynamics, Climate Change, and Sustainable Development in Africa* identified 11 countries in Africa, mostly in West Africa and the Sahel, that are expected to experience high projected declines in agricultural productivity as a result of climate change.[88]

FIGURE 16

There Are 44 Million More Undernourished People in SSA Than in 1990



Source: FAO, IFAD, amd WFP, 2015.

BOX 7

The Nexus of Population Growth, Climate Change, and Food Insecurity

The intersection of population, climate change, and food security is particularly visible in the Sahel region, which has experienced increased climate variability over the last 50 years. The combination of low rainfall, environmental degradation, insufficient agricultural investment, and more recently, civil conflict, has led to significant decreases in agricultural production.[1] Today, there are 12 million to 18 million hungry people in the Sahel, and despite a 1 percent increase in the region's overall crop yield in the last five years, the per capita crop yield decreased by 13 percent due to population growth.[2] Climate models predict that by 2050 the Sahel will be between 3°C to 5°C warmer than it is today, and extreme weather events, particularly severe drought, will be even more common. The length of the growing period across most of the Sahel is expected to decrease by more than 20 percent, resulting in declines in agricultural and livestock productivity.[3] These models suggest continued challenges to food security and recurrent needs for humanitarian food assistance.

Sources: [1] OXFAM, Food Crisis in the Sahel: Five steps to break the hunger cycle in 2012.; [2] Bixby Center for Global Reproductive Health, "By Slowing Population Growth, Family Planning Can Help Address Food Insecurity and Climate Change," August, 2015. ; [3] P. K. Thornton, et al., Mapping Climate Vulnerability and Poverty in Africa. Report to the Department for International Development, The International Livestock Research Institute (ILRI), Nairobi, Kenya, 2006.

A recent analysis of the potential impact of scaled-up family planning programs on population growth and food security illustrates that if all unmet need for family planning were met (between 2005 and 2050 in 99 developing countries) the total population in those 99 countries in 2050 would be 400 million lower than the UN's population projection (6.3 billion versus 6.7 billion people), reducing the rate of increase of demand for food.[89] In SSA in particular, reaching a total fertility rate of 2.1 in 2050 would reduce the size of the projected gap between the region's demand for food and crops produced by approximately 25 percent.[90]

Land Use Change, Arable Land, and Deforestation

Looking forward, SSA's population growth, in combination with changes in diet that require more grain for animal feed, will make the goal of eradicating hunger more challenging (see Enhancing Labor Productivity, page 34). Experts estimate that by 2050 future food needs in Africa will grow 3 to 4 times beyond current production levels.[91]

In addition to increasing food needs, population growth puts pressure on natural resources that are the basis of rural livelihoods and reduces the availability of arable land. More households and growing cattle populations have increased demand for croplands and grazing lands. This demand is straining existing land tenure systems as croplands expand into grazing areas and grazing lands are shared among more animals and additional users.[92] At the same time existing agricultural lands are being subdivided among large numbers of children. Agricultural plot sizes have decreased in Africa over the last several decades, leading many households to lack sufficient land to grow adequate amounts of food.[93] Though Africa is considered land abundant, home to more than 50 percent of the remaining arable land in the world, most of this land (around 90 percent) is concentrated in just eight countries.[94,95] A majority of the remaining countries are already experiencing constraints and are approaching the full extent of their arable land area.[96]

Current fuelwood consumption in SSA is dramatically outpacing the average increase in the stock of trees. Africa loses an estimated 5 million hectares of tropical forest area per year, which has significant environmental impact locally on ecosystem services and globally for climate change.[97] High rates of deforestation overlap with rapid population growth.[98] As SSA develops, growing agricultural needs in combination with gradually increasing consumption are damaging natural ecosystems such as forests. As agricultural plots have gotten smaller, households have sought new land to cultivate by clearing forests. At the same time, charcoal and wood remain the principal sources of cooking fuel in SSA, resulting in deforestation.

How Much Arable Land Is Available?

Though Africa is considered land abundant, home to over 50 percent of the remaining arable land in the world, most of this land (around 90 percent) is concentrated in just eight countries. A majority of the remaining countries are already experiencing constraints and are approaching the full extent of their arable land area.

Source: Jordan Chamberlin, et. al, "Scarcity Amid Abundance?" 2016.

There are stark tradeoffs when considering how to balance the need to expand agriculture to meet food security needs, protect forests to combat climate change, and conserve the benefits people receive from ecosystems, all while improving livelihoods to achieve the SDGs across the region. For example, domestic food supply in SSA will need to triple in the next 35 years, while SSA countries at the same time are attempting to reduce or stop deforestation.[99] Agriculture will therefore continue to expand in SSA, at the likely expense of forests, and tradeoffs between the SDGs of ending hunger and conserving forests need to be recognized.[100]

Water Scarcity

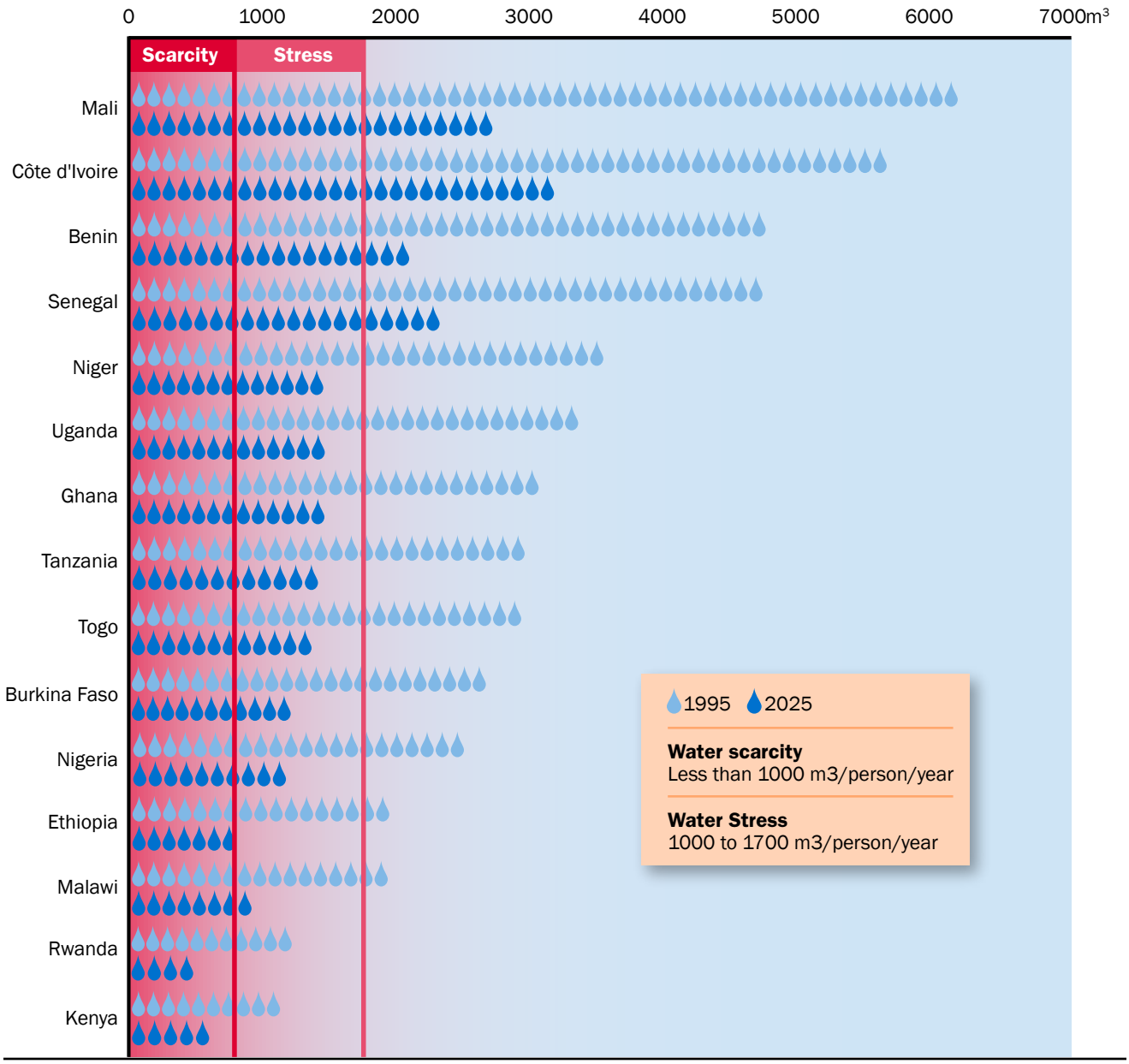
While the world has made great progress in increasing access to improved water sources, a safe and sufficient water source remains out of reach of many people living in rural areas of SSA, where more than a third of the population live in water scarce environments.[101] Water scarcity includes scarcity in availability of fresh water of acceptable quality, scarcity in access to water services, and scarcity due to lack of adequate infrastructure, irrespective of the level of water resources.[102] The scarcity of fresh water occurs, in part, as a consequence of climate change, but is worsened by the high dependency on ground water from rivers and underground aquifers for irrigation (see Figure 17). Aquifers are pools of water contained in rock layers and soil beneath the earth's surface. A United States National Aeronautics and Space Administration study in June 2015 confirmed that 21 of the 37 major natural aquifers around the world are being unsustainably drawn from to meet water consumption needs, and that some aquifers in Africa experienced little to no refilling to offset water withdrawals between 2003 and 2013.[103] Globally, the dearth of groundwater is already causing significant ecological damage, including declining water quality, depleted rivers, and subsiding land—all of which will likely be intensified by population growth and climate change.[104]

The 2014 Fifth Assessment Report of the IPCC noted that there is a high confidence that climate change will amplify existing stress on water availability in Africa.[105] Changing climate norms for precipitation and temperatures coupled with existing water scarcity threaten agricultural productivity, highlighting a need for families to build resilience by engaging in new agricultural techniques and new sources of sustenance and livelihoods, including migrating to urban areas and testing new crop varieties. Climate change can also affect water quality. For example, flooding can contaminate groundwater through boreholes and unprotected wells. As a result of long-term rainfall increase, groundwater levels may rise, decreasing the efficiency of natural purification processes, increasing risks of infectious diseases and of exposure to toxic chemicals.

Urbanization creates additional challenges for water scarcity because urban consumption of water tends to compete with water needs for agricultural growth, further straining already limited water sources in dry regions such as the Sahel.[106] This increased consumption is compounded by poor or aging water infrastructure and poor waste management, resulting frequently in insufficient water supply in Africa's largest cities. Aging water infrastructure and poor water and waste management have resulted in insufficient water supply in SSA's major

FIGURE 17

Annual Renewable Freshwater Availability per Capita (cubic meters) in 1995 and 2025 in Selected Countries



Source: Tom Gardner-Outlaw and Robert Engelman,"Sustaining Water, Easing Scarcity: A Second Update," http://pai.org/wp-content/uploads/2012/01/Sustaining_Water_Easing_Scarcity?_-_Full_Report.pdf.

cities; as a result, the urban population with no access to improved water and sanitation doubled from 1990 to 2004.[107] This is likely to be exacerbated in the next 50 years, due in part, to climate change that has forced nomadic or rural populations to settle in urban areas. Projections indicate that African cities will increasingly need to invest in infrastructure to accommodate short-scale water transport to satisfy the needs of growing urban populations.[108]

Rapid Urban Growth

The pace of urban population growth depends on the natural increase of the urban population and the population gained by urban areas through both net rural-urban migration and the reclassification of rural settlements into cities and towns.[109] In the developing world, Africa has experienced the highest urban growth during the last two decades—estimated to be at around 4 percent in 2013.[110] Currently, UNICEF estimates that the proportion of Africa's population dwelling in urban areas has already reached six in 10 people.[111] Projections also indicate that between 2010 and 2025, some African cities will account for up to 85 percent of the total population.[112] Table 5 presents urban population trends for selected cities in SSA, underscoring the extraordinarily rapid increase in urban growth just over the five year period from 2010 to 2015.

By 2030, around 2 billion people will be living in slums—twice as many as today and a direct consequence of unprecedented urban growth. Rapid urbanization often gives rise to large urban slums, which suffer from poor infrastructure and housing. When urbanization occurs at a very rapid pace, governments struggle to meet demands for housing, health, education, and other infrastructure needs. As a result, slums and informal settlements in urban areas have greater deficits in health, nutrition, and other areas in comparison with surrounding urban areas.

TABLE 5

Population Trends in Major Urban Areas of Sub-Saharan Africa (2010 and 2015)

	2010 (in millions)	2015 (in millions)
Abuja, Nigeria	1.81	2.44
Accra, Ghana	2.06	2.28
Addis Ababa, Ethiopia	2.92	3.24
Dar es Salaam, Tanzania	3.87	5.12
Kinshasa, DRC	9.38	11.59
Lagos, Nigeria	10.78	13.12
Nairobi, Kenya	3.24	3.92

Source: United Nations Department of Economic and Social Affairs, Population Division, *World Urbanization Prospects: The 2014 Revision*.

As most of the migrants from rural to urban areas are uneducated and unskilled, they end up working in the informal sector with low or intermittent incomes (see Labor Efficiency, page 26). Many migrants naturally seek shelter in cheaper slum areas. As a consequence, African cities have to cope with slum proliferation as well as increasing insecurity and crime.[113] In addition, weak government institutional structures have contributed to poor urban enforcement, resulting in dysfunctional land and housing markets, which in turn has caused the explosion of informal settlements.

One major challenge of urban population growth is access to food, which has resulted in an increasing number of people who pay for food and do not produce their own food.[114] Many of the urban poor lack a fixed income, and thus are even more vulnerable to changing

food prices in determining their ability to access adequate food. The urban poor can spend 60 percent or more of their income on food, which can lead to more limited food access. In response to higher food prices, many poor consumers who already spend the majority of their income on buying food revert to buying cheaper and less nutritious foods.[115]

Another challenge of Africa's rapid urban growth is the increasing pressure of urban populations on natural resources and the environment. The expansion of cities is generally at the expense of destruction of forests and other natural environment or ecosystems. Environmental degradation includes increasing pressures on farmlands and water resources leading to water scarcity, soil erosion, climate change, and increasing pollution (especially air pollution) with related diseases.[116] Reducing fertility and slowing the pace of population growth will help mitigate many of the negative social, economic, and environmental effects of rapid urbanization in the short term, and help governments better achieve their long-term sustainable urbanization goals.

Gender Inequalities

One final set of key factors undermining people's and communities' capacity to cope with and recover from disaster risks and climate events are gender-based inequalities and social exclusion.[117] Socially constructed roles, norms, and status are different between the genders, often creating marginalization and unequal levels of access to assets between women and men, and girls and boys. The combination of power structures and intra-household dynamics as well as inequalities in workloads, employment, and income restrict many women across SSA from accessing and securing livelihoods and achieving control over their lives.[118] Women's vulnerability is often ascribed to lack of information and skills, lower mobility, and lack of influence in decisionmaking. But they also frequently have fewer resources, fewer skills, and reduced opportunities. This undermines their ability to anticipate and prepare for major disasters and shapes their susceptibility and exposure to climate extremes.

Recent research in the Sahel indicates that men and women experience shocks and stresses in different ways, differ in their perceptions of the impact of shocks, and use different strategies and mechanisms to cope with and adapt to disturbances. For example, drought and erratic rainfall increase the workload of women and girls on family farms because they must walk longer distances and spend more time securing water for cooking, household sanitation needs, and caretaking of animals. Additional time spent on resource collection means less time available for education, income generation, or household food production.[119] In Senegal, increased demand for cash wages reshapes gender relations with women wanting to meet the needs and look out for their family's interests. Women support the livelihoods of their households both in terms of earning and time spent on domestic activities.[120]

Other factors that can influence women's educational attainment, family size, and economic security are child marriage, political and economic empowerment, access to resources, and adherence to rights. Gender-equitable workplace policies can also have a positive impact on reproductive health choices and economic security. Among these influencing factors, child marriage is one of the most appalling violations of human rights and deprives girls from reaching their full potential. Child brides tend to die younger, suffer from health problems, live in poverty, and remain illiterate. Young girls with low levels of education are also more likely to experience domestic violence. Combatting child marriage is critical, not only to support basic human rights and empower young women, but to help stop the cycle of poverty and contribute to building resilience among thousands of families and communities where child marriage is a routine practice.

Conclusion

Scientists from diverse fields are studying resilience to better understand different responses to crises. To increase resilience, households and communities need to have both adaptive capacity—the ability to quickly and effectively respond to new circumstances—and the ability to reduce vulnerability and the risk of impacts.

While there are many different ways to increase adaptive capacity, improving voluntary family planning services can help reduce the vulnerabilities that people face in the rise of environmental shocks and stresses, making it a valuable way to strengthen resilience. About one-third of pregnancies in SSA are unintended—around 17 million in 2012.[121] Voluntary family planning services empower women to time and space their pregnancies and have their desired number of children, resulting in safer pregnancies and healthier children. Healthier children place less of a care burden on mothers, thus freeing them to spend time increasing their own capacities. Avoiding unintended pregnancies and spacing births also yields economic benefits and gives women more control over their lives. With fewer children to care for, women will have more time and energy to complete their education, join the labor force, participate in the agricultural and livelihood changes that will be necessary to adapt to climate change, and decrease food insecurity.[122]

These benefits—health, education, diversified income sources, and wealth—are the foundation for resilient households. Helping women in SSA achieve their own aspirations for planning pregnancies and family size would put the world on a path to slower population growth, ultimately leading to substantial reductions in future carbon dioxide emissions, food insecurity, water scarcity, land use changes, and the negative effects of rapid urbanization.

SECTION IV

MAKING FAMILY PLANNING INTEGRAL TO DEVELOPMENT

Africa has the potential to increase its competitiveness and become a major player on the global economic stage. Innovations, technologies, and vibrant young entrepreneurs are paving the way for economic growth in new directions. The telecommunications sector continues to boom—SSA will pass the half-a-billion unique mobile subscribers mark in 2020—offering yet more opportunities to empower people and societies.[123] The family planning landscape has changed positively over the last five years. Modern contraceptive rates are increasing, new global initiatives are raising visibility and support for family planning, and more countries and donors are contributing needed resources. This convergence creates new opportunities to ensure that family planning is recognized as a key factor in national development policies and programs to help accelerate the attainment of key objectives such as employment, labor productivity, resiliency against shocks, and inclusive growth. At the same time, it is essential that government leaders, civil society, international donors, and development partners continue to work closely together to broaden and strengthen the management of family planning programs.

In summary, family planning programs should be an integral component of development strategies and plans. A disconnect between population age structure and development planning can reduce competitiveness and increase vulnerability to economic and environmental

shocks—leaving a country unprepared for the future. Effective development policies and programs must address the current needs of the population (largely youthful with high young-age dependency) while also planning for future changes in age structure, taking into account the size of the labor force, young and older age dependency, and population growth. Likewise, equitable economic growth is a valued development objective and family planning can help reduce the disparities in access to economic opportunities.

Family planning is an important tool in aligning demographic trends and development strategies. However, making family planning a priority and keeping it integral to development will require an engagement of multiple ministries. Ministries of planning and development need to analyze the development implications of different demographic scenarios, making these the basis of their development policies and programs. These ministries also serve an important role in tracking changes in family planning program outcomes such as total fertility rates and shifting age structures, and acting on the information to make policy and resource allocation adjustments where necessary. These and other planning and program efforts will require further research as well as ongoing data collection at the national, local, and household levels to better understand the demographic development linkages in the country context.

Other sectors including education, agriculture, food security, health, youth, and environment should analyze the impact of family planning programs on their sector and determine how they can contribute to it. For example, school-based family planning counseling and information for youth are important contributions from the education sector. Likewise, as demand for services grow, ministries of health must strive to integrate family planning services into diverse health programs, ensuring that women and men have multiple entry points to services and access to a full range of contraceptive methods, including long-acting reversible and permanent methods, to satisfy their reproductive needs at different life stages.

And finally, governments need to embrace innovation and advances in information technology to help facilitate the availability and use of data for future development planning, and to make policies and programs more responsive to current and shifting age structures.

Conclusion

The decisions made today can affect the course of population growth in SSA. Even small changes in fertility levels today can have immediate positive effects on family welfare and major long-term effects on population size and structure. Family planning can and should play a much larger role in SSA's development. In countries where investments in family planning are prioritized and fertility declines, governments are able to reap the many health, economic, and development benefits that family planning has to offer. Strong and inclusive voluntary family planning programs in every country will make a difference in the quality of life for individuals, families, and communities, and for the attainment of each nation's development goals.

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APPENDIX A

TABLE 6

Difference in Population of Children <15 Years Old (and Percentage Increase) Between 2015-2025 and 2025-2050, Low and Medium Variant Scenarios

	# People <15 in 2015	2015-2025				2025-2050			
		Difference in population of children <15 between 2015-2025 Low Variant		Difference in population of children <15 between 2015-2025 Medium Variant		Difference in population of children <15 between 2025-2050 Low Variant		Difference in population of children <15 between 2025-2050 Medium Variant	
	Millions	Millions	% Increase	Millions	% Increase	Millions	% Increase	Millions	% Increase
Rapid Progress (annual increase > 2 percent and/or mCPR ≥ 40%)									
Ethiopia	41.2	1.5	4%	4.3	10%	-5.5	-13%	3.4	7%
Kenya	19.3	1.8	9%	3.1	16%	2.2	10%	7.0	31%
Madagascar	10.1	1.7	17%	2.4	24%	2.6	22%	5.5	44%
Malawi	7.8	1.5	20%	2.0	26%	2.7	29%	4.8	49%
Rwanda	4.8	0.0	0%	0.3	7%	-0.6	-13%	0.4	7%
Senegal	6.6	1.3	20%	1.7	26%	2.3	28%	4.0	47%
Zambia	7.4	1.6	22%	2.1	28%	4.3	48%	6.5	68%
Encouraging Progress (annual increase >1 & ≤ 2 percent)									
Liberia	1.9	0.2	11%	0.3	17%	0.3	15%	0.8	35%
Niger	10.0	4.3	43%	4.8	48%	13.4	93%	16.8	113%
Tanzania	24.2	5.4	22%	6.9	29%	10.9	37%	18.1	58%
Uganda	18.8	4.2	22%	5.2	28%	7.4	32%	12.6	53%
Slow Progress (annual increase ≥ 0.5 & ≤ 1)									
Burkina Faso	8.3	1.4	18%	1.9	23%	2.7	27%	4.8	47%
Ghana	10.6	1.0	9%	1.7	16%	0.2	2%	2.5	20%
Togo	3.1	0.4	12%	0.6	19%	0.6	17%	1.4	38%
No Progress (annual increase < 0.5)									
Benin	4.6	0.6	12%	0.8	18%	0.5	11%	1.6	30%
Congo, Democratic Republic	35.5	8.1	23%	10.1	28%	14.1	32%	23.8	52%
Cote d'Ivoire	9.6	1.5	16%	2.1	22%	2.8	25%	5.3	45%
Guinea	5.4	0.8	15%	1.1	21%	1.0	16%	2.4	37%
Mali	8.4	1.9	22%	2.3	28%	3.8	37%	6.0	57%
Mozambique	12.7	2.2	17%	2.9	23%	4.3	29%	7.5	48%
Nigeria	80.1	13.6	17%	18.0	22%	24.0	26%	42.2	43%

Source: Estimated from United Nations, *World Population Prospects, The 2015 Revision.*

APPENDIX B

TABLE 7

Increase in Working Age Population (and Percentage Increase) Between 2015-2025 and 2025-2050, Low and Medium Variant Scenarios

Country	2015	2025		2050			
				Low variant		*Medium variant*	
	# working age people (15-64) in 2015	Increase in # working age people between 2015 and 2025		Increase in # working age people between 2025 and 2050		Increase in # working age people between 2025 and 2050	
	Millions	Millions	Percent	Millions	Percent	Millions	Percent
Rapid Progress (annual increase > 2 percent and/or mCPR ≥ 40%)							
Ethiopia	54.7	20.0	37%	43.6	58%	51.8	69%
Kenya	25.5	8.7	34%	22.1	65%	25.9	76%
Madagascar	13.4	4.7	35%	14.0	77%	16.1	89%
Malawi	8.8	3.7	42%	12.4	98%	13.9	110%
Rwanda	6.5	2.2	34%	4.4	50%	5.3	61%
Senegal	8.1	3.0	37%	9.6	87%	10.9	98%
Zambia	8.3	3.5	42%	12.0	102%	13.4	114%
Encouraging Progress (annual increase >1 & ≤ 2 percent)							
Liberia	2.5	0.8	34%	2.3	68%	2.6	79%
Niger	9.3	4.6	49%	23.0	165%	24.7	177%
Tanzania	27.6	11.0	40%	38.0	98%	42.6	111%
Uganda	19.3	8.9	46%	29.7	105%	33.1	117%
Slow Progress (annual increase ≥ 0.5 & ≤ 1)							
Burkina Faso	9.4	3.7	39%	11.6	88%	13.0	99%
Ghana	15.8	4.3	27%	10.0	50%	12.0	59%
Togo	4.0	1.4	34%	3.8	70%	4.4	81%
No Progress (annual increase < 0.5)							
Benin	6.0	2.1	35%	5.4	67%	6.3	78%
Congo, Democratic Republic	39.4	16.3	41%	55.8	100%	62.0	111%
Cote d'Ivoire	12.4	3.7	30%	12.0	74%	13.7	85%
Guinea	6.9	2.3	34%	7.1	77%	8.1	88%
Mali	8.8	3.7	42%	13.2	106%	14.6	117%
Mozambique	14.4	5.2	36%	18.0	92%	20.2	103%
Nigeria	97.1	31.8	33%	100.9	78%	113.5	88%

Source: Estimated from United Nations, *World Population Prospects, The 2015 Revision.*

APPENDIX C

Four Case Studies: Methodology and Limitations

The four case study analysis examines disparities in fertility decline and the association with access to economic opportunity. To demonstrate the age structure changes associated with differential patterns of fertility decline among quintiles, two alternate scenarios of fertility decline for the lowest and highest income quintiles have been constructed. The projections were generated using data from the most recent Demographic and Health Surveys (DHS) and the 2015 UN Population Projections. The 2015 baseline age structure for each country was generated using trends in fertility decline between the last two surveys.[104] The two alternative scenarios are:

1. **Current rates of total fertility rate (TFR) decline continue:** In this scenario, fertility decline continues at current rates, established on the basis of the rate between the last two DHS in each country. In countries where the TFR of the poorest quintile increased between the last two surveys, gradual decline was assumed to take place, based on earlier rates of decline that the specific country experienced.

2. **Rates of TFR decline accelerates and become more equitable:** In this scenario, the richest quintile achieves replacement fertility by 2030 and the poorest quintile by 2035. Although these assumptions are very ambitious, the experiences of Rwanda between 2005 and 2010 and Kenya between 2003 and 2014 demonstrate that rapid TFR decline can be achieved in just afew years.

The two scenarios are examined in four countries that represent variations in family planning program performance and are categorized by yearly percentage point increment in modern contraceptive prevalence rates (mCPRs):

- Rwanda(with 2.9 average annual percent point increment between 2007 and 2014) and Kenya (with average annual 2.8 percent point increment between 2008 and 2014) are both defined as achieving "rapid progress," but represent different historical patterns of equity in mCPR between quintiles;
- Uganda (average annual 1.6 percent point increment between 2006 and 2011) has achieved "encouraging progress."
- Nigeria's mCPR has stagnated.

The quintile population projections for the alternate scenario were generated using the DemProj software in Spectrum.[104] Projected mCPRs were estimated using the FamPlan software.

The pyramids show the shape of the population age structure and also give key demographic factors such as TFR, mCPR, and TDR as well as median ages and proportion of persons in working ages and below working ages. The analysis defines a favorable age structure as one in which:

- Young dependent ages 0 to 14 comprise 30 percent or lower.
- Working ages 15 to 64 comprise 66 percent or higher.
- The median age is 25 years or older.

These recommended age structure parameters are defined based on the experience of the "Asian Tigers," where age structure shifts had critical impact on access to economic opportunity. Thailand, for example, saw its TFR decline from 6 births per woman in 1960 to 2.1 by 1990.[104] As a result, the age structure shifted such that the young dependent ages 0 to 14 comprised 30 percent of the total population, while one-third were in the working ages 15 to 64. Similar age structure changes occurred in South Korea in the 1980s and Malaysia in the 2000s. Such shifts, along with investments in education and job creation, contributed to these countries' rapid economic growth.

The median age of the population is included in the analysis based on Cincotta and Doces' 2012 study that showed that a young median age is associated with social and political instability.[104] Countries at or below a median age of 25 years infrequently achieve a liberal democracy. Those that do are likely to decline to more limited models of democracy within ten years, and half of those that declined experienced political violence.

Limitations

The analysis presented in this review is exploratory and not comprehensive, as it analyses only four countries. However, the authors are preparing projections of the poorest and richest quintiles for other SSA countries to illustrate further the impact of fertility inequities on age structure and potential access to economic opportunities in the region.

The methodology used in the analysis has several limitations. The first limitation is that the analysis does not address all of the direct and indirect determinants of fertility. In SSA, three key determinants are contraceptive prevalence (especially modern contraceptive prevalence), age at marriage, and desired family size. This analysis focuses specifically on modern contraceptive prevalence, rather than the overall contraceptive prevalence rate (CPR) as the traditional methods included in CPR are not as effective in regulating fertility. Additionally, to simplify the model for projecting fertility trends over time, the projections retain the same modern contraceptive method mix reported in the latest DHS for each country, attributing changes in fertility primarily to increasing use of modern contraceptives. More complex models, which account for the possibility of changes in method mix towards highly effective modern methods, such as the IUD, could show accelerated fertility decline.

Furthermore, this analysis only refers to the extreme quintiles (the top 20 percent and bottom 20 percent). Poverty in Sub-Saharan Africa countries is pervasive and many of those included in the middle wealth quintiles are also poor. While it is possible to create age structure pyramids for each quintile, to simplify the analysis and presentation of the projections, only the extreme quintiles were modeled.

Finally, the projections are attempts to follow the 2015 quintile over time. As such, these are not projections of what the actual top and bottom 20 percent of the population would be in 2050, but how the 2015 quintile (or cohort) population would change overtime based on assumptions about the cohort's fertility behaviors. Future populations will have different numbers of people and socio- economic groupings with disparate growth rates.

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