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ECONOMIC IMPACT OF FERTILITY DECLINE IN JORDAN

JUNE 2012

This publication was produced for review by the United States Agency for International Development. It was prepared by Douglas Heisler through the Global Health Technical Assistance Bridge Project.

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GH Tech Bridge Project
1725 Eye Street NW, Suite 300
Washington, DC 20006
Phone: (202) 349-3900
Fax: (202) 349-3915
www.ghtechproject.com

This document was submitted by Development and Training Services, Inc., with CAMRIS International and Social & Scientific Systems, Inc., to the United States Agency for International Development under USAID Contract No. **AID-OAA-C-12-00004**.

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ACRONYMS

BCC	Behavior change and communication
CDR	Crude death rate
CM	Cubic meters
CPR	Contraceptive Prevalence Rate
DOS	Department of Statistics
ERC	Electricity Regulatory Commission
FP	Family planning
GDP	Gross Domestic Product
GOJ	Government of Jordan
HPC	Higher Population Council
IEC	Information education and communications
IMR	Infant mortality rate
JD	Jordanian dinar
JPFHS 2009	Jordan Population and Family Health Survey, 2009
LAM	Lactational Amenorrhea Method
MOH	Ministry of Health
MWRA	Married women of reproductive age
NEPCO	National Electricity Power Company
NGO	Non-governmental organization
NPC	National Population Commission
NPS	National Population Strategy
NVP	National Vaccination Programme
ONEP	The National Board for Family and Population
RAPID	Resources for the Awareness of Population Impacts on Development
TFR	Total fertility rate
UNRWA	United Nations Relief and Works Agency
USAID	United States Agency for International Development
WHV	Woman Health Volunteer

EXECUTIVE SUMMARY

The total fertility rate (TFR) in Jordan has declined remarkably in less than two generations from 7.4 children per woman in 1976 to 3.8 children per woman in 2009, but statistically there has been no change since 2002 when the TFR was 3.7. The Government of Jordan (GOJ) is concerned about the impact of population growth and has a goal to reduce the TFR to less than 2.5 by the year 2020 and to replacement fertility (2.1) by 2030 as a condition for sustainable economic development. At the household (micro) level, the Jordanian ideal is 4.2 children per family, which is only slightly higher than the TFR of 3.8 in 2009, despite the increasing costs of living and high unemployment throughout the Kingdom. Jordan is a fairly developed urban country with relatively high levels of education and a high age at first marriage—all of which are conditions for reduced fertility. However, the fertility level of the population remains high, fueling a national population growth of 2.2% per year which, if it continues, would double the population to nearly 13 million by 2040.

A close look at the policies of the GOJ and conditions at the household level explain why Jordanian families continue their high fertility and suggests a direction for the future. Although the Kingdom would be better off with slower population growth, families are behaving rationally when the entire financial and social costs and benefits of fertility are considered. There is strong cultural support for large families and great social pressure to produce children, which results in a very high cost of not having children. Marriage is virtually universal; a woman is expected to stay home and care for the family and her status depends not on her role as a wage earner, but rather as a housewife and mother. Because there are limited options for female employment, there is little financial opportunity cost to the household if the woman does not seek to work for income outside the home. The government also provides an array of subsidies in health, education, medical care, food and fuel that effectively reduce the financial cost of children; and households can also rely on the safety net provided by their extended families.

With very strong leadership and commitment from the highest levels of government, fertility could be reduced from the current TFR of 3.8 to 2.6. This would require a comprehensive and integrated national FP program, and could be accomplished without the GOJ aggressively encouraging families to have fewer children. The GOJ could achieve this outcome by addressing the joint effects of the unmet need for family planning (FP) and the missed opportunities for counseling; and by making the full range of contraceptives available, including modern long-term methods. The final stage of fertility reduction from a TFR of 2.6 to a replacement fertility level of 2.1 TFR will depend on changes in society, economic conditions, and families' demand for children. This final step to replacement fertility will take time, perhaps even another generation; but the fertility transition that has been proceeding for nearly 40 years in Jordan is expected to continue, if slowly, and it will both respond to, and will also contribute to, national development.

I. INTRODUCTION

Would the Kingdom of Jordan be better off at the national (macro) level if fertility continues to decline? Would the average Jordanian household be better off with fewer children? And are these two perspectives compatible?

This discussion is grounded in the socio-economic literature of population and development that has evolved since the time of Reverend Thomas Robert Malthus at the end of the 18th century to current models that incorporate traditional economics, social and cultural values, theories of the diffusion of information, the importance of gender, communications, and the role of community on the choices made by individuals, women and couples. This paper connects these determinants of fertility at the macro- and micro-levels to Jordanian society and discusses the expected benefits of continued fertility decline in the Kingdom.

This paper also discusses the likelihood of whether or not the long-term fertility transition—that began in 1976 when the average woman had 7.4 children (TFR=7.4) and has stalled for the past 10 years at half that rate (TFR=3.8)—will soon reach the replacement level of TFR 2.1.

This paper concludes with a discussion of the steps needed for the fertility transition in Jordan to resume.

II. POPULATION AND DEVELOPMENT AT THE NATIONAL LEVEL

The literature of economics and development and experience throughout the world since the 19th century show that population is related to economic development at the national (macro) level, but the relationship is not clearly understood. This section briefly reviews that question and considers related variables, such as the impact on development due to a shift in the age structure of a population, gender, urbanization and the diffusion of information. In brief, fertility decline has been shown to accelerate development. This long-term trend in fertility decline may also begin, or continue, without strong levels of economic development, without government policy and without widespread FP programs. But fertility decline does require access to FP information and methods; further, reduced fertility must be seen by the potential family planner as a benefit. Professor Ansley J. Coale,¹ the director of Princeton University's European Fertility Transition Project, outlined these three conditions for fertility decline:

1. "Fertility must be within the calculus of conscious choice;
2. Reduced fertility must be perceived as advantageous; and,
3. Effective techniques of fertility reduction must be available."

Once it begins, the transition from high to lower fertility continues without interruption. It can be positively influenced and supported by government policy and programs, but it may take more than 40 years and may continue in stages with plateaus along the path—from initial high levels (6+ children per woman) to replacement fertility (2.1 children per woman) or lower. However, very rapid fertility decline appears to depend on a fourth condition, which is aggressive leadership from the highest levels of society. The experience of Tunisia and Brazil are examples of long-term fertility decline related to development, with and without strong government support respectively. And the experiences in China and Iran are examples of very rapid fertility decline to support development, based on very strong leadership from each country's highest political and/or religious leaders.

POPULATION AND ECONOMIC DEVELOPMENT²

"Do reductions in fertility improve a family's present well-being and future prospects and does rapid population growth adversely affect the overall performance of the economy and its ability to achieve and sustain general well-being?" Dr. Stephen Sinding, a recognized economist and population expert, addressed these questions in an important paper in 2009. He found that "there is a general consensus that improved economic conditions at the national and family level lead to lower fertility; and, there appears to be a slowly growing agreement that reduced fertility improves the economic prospects of families and societies." Among his examples, Dr. Sinding referenced a study in Indonesia showing that families were pushed into poverty when a woman's contribution to household income dropped when she left the labor force to have an additional child. However, he also noted that "if parents perceive children as good in and of themselves, and are willing to forego other forms of consumption for the sake of having a large number of

¹ A.J. Coale, "The Demographic Transition," Proceedings of the International Population Conference, Liege, 1973.

² This section quotes extensively from Steven W. Sinding, "Population, Poverty and Economic Development," *Philos Trans R Soc Lond B Biol Sci.* 2009, October 27, 364 (1532): 3023–3030.

children, most economists would argue it is hard to make the case that they should be urged to have fewer of them.” He concludes, “empirical studies increasingly support the idea that countries that have incorporated population policies and family planning programmes in their overall economic development strategies have achieved high and sustained rates of economic growth and that they have also managed significant reductions in poverty.” This outcome is reinforced if governments also “address skewed income distributions, invest in education and health to create the human capital for sustained economic growth,” and adopt “the more conventional economic policy prescriptions regarding savings and investment, incentives to industry, export-oriented growth, monetary and fiscal policies and the development of capital and equity markets.”

Dr. Thomas Merrick, World Bank Economist/Demographer, summarized the literature of economics and development with this conclusion: “Family planning alone will not necessarily reduce poverty in developing countries, but neither will many of the present models of economic development. On the other hand, a slower rate of population growth, combined with sound and equitable economic development and the reduction of gender inequality, appears increasingly likely to achieve that goal. In sum, fertility and FP do matter for poverty reduction—for poor households and for poor countries. They are not the only, or even the most important, factors in poverty reduction.”³

ECONOMICS AND FERTILITY

The economic literature on population and development has evolved since the end of the 18th century when Reverend Thomas Robert Malthus argued that high fertility and poverty are directly linked. Thus, he urged couples to delay marriage until they could afford children and to abstain in the interim. However, this “Malthusian” approach was based on the assumption that the link between sex and fertility could not be broken. By the mid-20th century, declining mortality and high fertility led to rapid population increase because the “Malthusian” prescription of sex in marriage or abstinence was not realistic. At that time, the “Neo-Malthusian” school of economics refined the discussion. Those economists argued that high population growth diverts resources at both the national- and household-level from savings that could be used for development and investment in the future into current expenditures to meet the more immediate needs of a growing population either in a country or in a large family with many children. However, the availability of modern contraceptives by the 1960s meant that the links among sex, fertility and poverty were not inevitable—and influenced international donors to fund FP programs around the world.

The discussion of economics and fertility then shifted to the reasons that couples would chose to adopt FP. This search for a model to explain the relationship between fertility and the welfare of the family at the micro-level—and by extension population and economic development at the national level—has been dominated for nearly a half century by the work of two renowned economists: Noble laureate Dr. Gary Becker and Dr. Richard Easterlin. Dr. Becker⁴ adapted the model of the demand for consumer durables as a framework to analyze the demand for children and assumed that each couple had perfect control over the number and spacing of births. In his

³ Thomas W. Merrick, “Population and Poverty: New Views on an Old Controversy,” *International Family Planning Perspectives*, Volume 28, Number 1, March 2002.

⁴ Gary S. Becker, “An Economic Analysis of Fertility,” in “Demographic and Economic Change in Developed Countries,” Princeton: National Bureau of Economic Research, 1960, pages 209-231.

landmark paper, “An Economic Analysis of Fertility,” Dr. Becker assumed that the potential supply of children is set by the limits of natural fertility and the demand for children is determined by household income, while the “utility” provided by children is determined by the parents’ relative preference for children (“tastes” for children) versus other goods. This demand for children is also balanced by the net costs of raising children, which may include a monetary return in some situations, and also includes the opportunity cost of the woman’s time. Dr. Easterlin⁵ expanded Dr. Becker’s cost-focused economic model to include the socio-economic determinants of the demand for children. He emphasized the factors that influenced the tastes (preferences) for children and the factors that influenced the “supply” of children. For example, Dr. Easterlin assumed that a family’s “taste” for children is strongly influenced by the society in which it lives; by the expectations from one generation to another; and by the consumption and family size patterns that the husband and wife experienced when they were children. He also expanded the model for the “production” of children and the decision to have more children to include: the number of children ever born; infant and child mortality; frequency of sex; the reproductive span of the household (age at marriage and age at onset of permanent sterility); completed family size; length of time and intensity of fertility control; and other factors that influence the number of children ever born or their chances of survival (e.g., lactation, health and nutrition). And, finally, Dr. Easterlin included the cost of fertility regulation in his expanded model of marital fertility.

Later, Dr. Easterlin’s assumptions about the social basis for the couple’ preferences (tastes) for children were echoed in the findings of the behavior change and communication (BCC) community: “To be most effective in the long term (Behavioral Change Communications) programs must focus not only on motivating individual change, they must also change the social and cultural contexts that influence individuals.”⁶

BONGAARTS’ PROXIMATE DETERMINANTS OF FERTILITY⁷

Dr. John Bongaarts, a distinguished scholar at the US Population Council and member of the National Academy of Sciences, proposed the “Bongaarts model” to describe how the TFR in a population is affected by four “proximate determinants of fertility.” These include: 1) marriage (the proportion of women in marriage [i.e., exposed to the risk of pregnancy] and the marital fertility rate); 2) contraception (the proportion of married women of reproductive age [MWRA] who are using contraception, the method mix and the effectiveness of the methods used); 3) abortion (the level of induced abortion); and 4) post-partum infecundability (resulting from lactational amenorrhea produced by breastfeeding and the duration of postpartum abstinence). The Bongaarts model has been widely used to account for differences in the TFR in a population over time and to describe the differences in the TFR between different populations.

⁵ Richard Easterlin, Robert Pollak and Michael L. Wachter, “Toward a More General Economic Model of Fertility Determination: Endogenous Preferences and Natural Fertility,” pages 81-150 in Richard A. Easterlin, Ed., “Population and Economic Change in Developing Countries,” University of Chicago Press, 1980.

⁶ Ruwaida M. Salem, Jenny Bernstein, Tara M. Sullivan and Robert Lande, “Communication for Better Health,” Population Reports, Series J, Number 56, Johns Hopkins Bloomberg School of Public Health, January 2008.

⁷ Bongaarts, John and G.R. Potter, Fertility, Biology and Behavior: An Analysis of the Proximate Determinants, Academic Press, New York, 1983.

DEMOGRAPHIC DIVIDEND⁸

The recent interest in the “demographic opportunity” and “demographic dividend,” when age structure shifts to a lower dependency ratio following rapid fertility decline (if mortality is low and net immigration is negligible) can be viewed as an extension of the Neo-Malthusian model of economics and fertility.

In a 2002 paper on population growth and poverty at the national and household levels, Dr. Merrick discussed the concept of the “demographic dividend” from rapid fertility decline. He reviewed research on the relationship between population growth and economic growth at four stages of the “demographic transition.” These include 1) high fertility and mortality; 2) high fertility and low mortality; 3) declining fertility and low mortality; and 4) low fertility and low mortality. Stage three (where Jordan is today) provides a “demographic ‘window of opportunity’ during which increased personal savings and investment become possible.” Dr. Merrick explained that, “As fertility rates drop, the ratio of potential workers (people aged 15–64) to non-workers (people aged 14 or younger and people aged 65 and older) rises, meaning that more workers are responsible for dependents. The reduction in the ratio of youthful dependents to working-age adults should enable countries to increase their stocks of physical and human capital (schools and well-trained teachers; health care facilities and well-trained health workers; and modern communications networks and well-trained workers to staff them).”

However, opening a demographic “window of opportunity” does not guarantee a surge in economic growth or long-term sustained economic growth. For one thing, it is temporary because low fertility will eventually increase the proportion of another dependent group—the population made up of older people who are no longer working. The intensity of the age-structure effect depends on the speed with which the transition to low fertility takes place. It also depends on countries’ pursuing sound economic and social policies, to enable the large wave of potential workers to acquire skills and find productive employment, and as a result “a temporary surge in the accumulation of physical and human capital contributes to a rapid rise in living standards.”

GENDER⁹

Professor Cosio-Zavala from the University of Campinas in Brazil introduced a gender perspective in explaining fertility transitions at the United Nations’ Expert Group Meeting on Completing the Fertility Transition, March 11–14, 2002. She argued that: “Gender relations have an important role in explaining fertility behavior, a critical and neglected process in explaining fertility transitions.” She stressed that the gender perspective in fertility decline is a “theoretical point of view that has been missing in the debate. Dr. Cosio-Zavala’s work cited Rockefeller Foundation-supported surveys of women’s autonomy in five Asian countries in the early 1990s in relation to reproductive behavior in which women were asked about their decision-making authority, personal freedom, control over economic resources and wife-husband power relations, and analysis of the USAID-supported Demographic and Health Surveys that included

⁸ This section quotes extensively from Thomas W. Merrick, “Population and Poverty: New Views on an Old Controversy,” *International Family Planning Perspectives*, Volume 28, Number 1, March 2002.

⁹ This section draws on, and quotes extensively from, Maria E. Cosio-Zavala, “Examining Changes in the Status of Women and Gender as Predictors of Fertility Change Issues in Intermediate Fertility Change Countries,” in the *Proceedings of the Expert Group Meeting on Completing the Fertility Transition, March 11-14, 2002*, UN Department of Economic and Social Affairs, Population Division, in New York City, USA.

questions about communications on FP by couples. She concluded that increased autonomy of the woman and increased communication about FP and agreement on reproduction are predictors of reproductive behavior.

URBANIZATION

It is accepted that urban fertility is lower than rural fertility.

“Cities have also played a crucial role in reducing fertility, thereby slowing world population growth. In the 19th century, urban residents of Europe and North America were among the first people to widely practice family planning, and they helped spread the idea of fertility regulation to the countryside. Today, fertility levels are invariably lower in urban than in rural areas of less developed countries.”¹⁰

This finding has been documented by the data obtained in the international Demographic and Health Surveys funded by USAID. For example, a comparative study in 1998 showed higher urban than rural fertility in all of the 28 countries included in the analysis.¹¹ This finding was confirmed by the author in April 2012 when a quick tabulation of TFR by residence for all of the most recent DHS surveys reports showed higher central measures of urban than rural in all of the 86 countries in the tabulation.

Reasons for lower fertility in urban areas can include:

- A shift from an agriculture- to market-based economy and lower economic value of children;
- Increased costs of living, female labor-force participation, access to information by women, girls’ education, access to FP, access to health services and reduced mortality; and
- A shift to nuclear families that reduces both the social pressures for large families and also reduces the social and economic “safety net” that the extended family can provide in terms of the economic and child-rearing support that is often required by large families.

DIFFUSION

However, the above conditions for fertility decline are not absolute—in fact, there is evidence from the European fertility transition that the shift from high to lower fertility actually occurred in their absence. In a groundbreaking article in 1980, demographers Dr. John Knodel and Dr. Etienne Van de Walle,¹² using data from parish registers from churches in Western Europe, found that “systematic contraception to limit family size originated with the French-speaking upper classes,” and that it “began under remarkably diverse socio-economic and demographic conditions.” Before the fertility decline began in the late 1880s in Europe, there was little knowledge that it was possible to control fertility or the methods that could be used to do so. Once this knowledge was obtained, it rapidly diffused throughout Europe—and after deliberate fertility control began, it spread rapidly and was irreversible. They observed that, “there was no

¹⁰ Martin P. Brouckerhoff, “An Urbanizing World,” *Population Bulletin*, vol. 55, no. 3 (Washington, DC: Population Reference Bureau, September 2000).

¹¹ Gora Mboup and Tulshi Saha. 1998. *Fertility Levels, Trends and Differentials*. DHS Comparative Studies No. 28. Calverton, Maryland: Macro International Inc.

¹² Etienne van de Walle and John Knodel, “Europe’s Fertility Transition: New Evidence and Lessons Learned for Today’s Developing World.” *Population Bulletin*, Vol. 34, No. 6. Population Reference Bureau, Inc. Washington, D.C., 1980.

easily definable threshold of social and economic progress for it (fertility decline) to begin.” “There is only a loose relationship between the level of socioeconomic development and fertility decline.” “Apparently the level of development necessary to provoke a change in reproductive behavior is so variable that there is no telling, except after the fact, whether modernization was advanced enough for fertility to decline.” “We believe that the historical record suggest that special attention should be paid to those cultural features that determine the status of women and their ability to assert their own wishes regarding childbearing.” The policy lesson was that there are three key factors for fertility decline to begin in a population: 1) knowledge that fertility could be deliberately controlled; 2) access to the methods of fertility control; and 3) widespread diffusion of this knowledge.

In writing about the importance of the diffusion of ideas and changes in cultural values with regard to fertility, Professor Dudley Kirk¹³ wrote: “Diffusion is not merely a residual, but (is also) an active agent in promoting or retarding the practice of fertility control...In other words, control of fertility is as much a group decision as a decision of an individual or couple.” He discusses the impact of the media in transmitting new ideas, especially television, “even when their purpose is to amuse rather than to instruct. But their legitimation requires that they be confirmed in informal day-to-day communications with significant others, such as relatives, friends and leaders in the local community.” However, Professor Kirk cited the failed Pakistan FP program in the early 1960s when he observed that a strong government population program will fail if the people of a country are not, at some level, ready to hear the message.

¹³ Taken from Dudley Kirk, “Demographic Transition Theory,” *Population Studies*, 50 (1996).

III. GOVERNMENT POLICY AND LEADERSHIP

The literature demonstrates that fertility decline over time has been linked to increasing levels of development, modernization, urbanization, access to and the diffusion of knowledge about FP, the change in the status of women and a change in the demand for children. However, recent examples of very rapid fertility decline have often been the result of a national commitment and strong leadership at the highest levels, reinforced by information on, programs for and access to FP. This national commitment is demonstrated by the inclusion of population in national development plans; a whole-of-government approach across all sectors; widespread information and communication; widespread access to all methods of FP options; and commodities readily available at an attractive price.

RAPID FERTILITY DECLINE IN CONCERT WITH DEVELOPMENT— WITH AND WITHOUT GOVERNMENT POLICY: THE EXPERIENCE OF TUNISIA AND BRAZIL

Tunisia¹⁴

Fertility declined dramatically in Tunisia during the 40 years between 1964, when the average woman had nearly eight children (TFR=7.9), and 2001 when TFR reached replacement fertility at 2.1 where it has remained to date.

This remarkable drop in fertility can be credited to Tunisia's visionary Habib Bourguiba who led Tunisia's struggle for independence from France after World War II and served as President of Tunisia after independence in 1956 until his retirement in 1987. "President Bourguiba was the architect of a "code of personal status" that enhanced women's rights by codifying a woman's legal status as a citizen, banning polygamy, setting a minimum age of marriage, requiring the consent of the woman before marriage, and legalizing abortion. He viewed population increase as a problem that was linked to poverty and women's health, and he strongly supported a national FP program that was adopted in the early 1960s. Regional committees were established to disseminate information on contraceptive methods. The Tunisian Family Planning Association was established in 1968 when it set up the first FP clinic and began to provide services in remote areas. The National Board for the Family and Population (ONEP) was established in 1973, and managed by a board of directors representing nine ministries and three national organizations and was made accountable to the Ministry of Public Health. In 1974, the government also established the High Council for the Family and Population as a guiding and supervisory body to define government policy as well as to determine ONEP's major strategies, programs and action plans. It is chaired by the Prime Minister. In 1979, the Ministry of Education integrated population education into primary, secondary and higher education curricula as well as in training programs for teachers and school inspectors. And the Government of Tunisia's FP policy was constantly voiced and disseminated by the national media."

¹⁴ This section quotes extensively from Hala Naufal Rizkallah and Hassan Zaky, "Does conflict impact demographic transition? A comparison between two forerunners of fertility decline, Lebanon and Tunisia," IUSSP 26th International Population Conference, 27 September-2 October, 2009.

Brazil

It is a challenge to draw lessons on the relationships between population and development from the decline in fertility in Brazil, from TFR=5.8 in 1970¹⁵ to replacement (TFR=2.1) around 2001 and the current level of TFR=1.9.¹⁶

The fertility change in Brazil began without a strong national policy and continued steadily during 40 years with varying levels of government support; it continued when the economy was both weak and strong, and when contraceptive choices were both readily available and when access to a range of methods was limited. Although no single factor can be isolated to explain Brazil's fertility decline, several factors cited by demographers contributed including urbanization, poverty, increased female labor force participation, increasing levels of female education, the widespread and very high levels of female sterilization and the use of oral contraceptives.

The most important reason for fertility decline in Brazil may be Professor Coale's second condition: "reduced fertility must be perceived as advantageous." This may have happened in Brazil following a cultural shift based on communications among a population that was ready to hear the message, which was broadly shared through commercial soap operas on television.

Fertility Change and Telenovelas¹⁷

An Inter-American Development bank study published in 2008 investigated the effect of television soap operas (*telenovelas*) on women's fertility in Brazil between 1970 and 1991. It found a significant relationship with lower fertility for all women, but stronger for women of lower socio-economic status and higher parity. Its effect was not related to television watching in general; rather it was specifically linked to watching these soap operas. "The *novellas* idealize the values and lifestyle of the small, wealth and urban middle class consumerist family, spreading its values, attitudes and behavioral patterns."

Every night 60–80 million Brazilians watch the daily *telenovela*, in which the main female characters have either no children or only one. They are popular because they are produced in Brazil with high production values; are set in easily recognizable locations; deal with the issues and situation in the daily life of Brazilians; and use colloquial language. Themes include freedom, criticism of religious and traditional values, consumption of luxury goods, portrayal of wealthy families, and their life style, and modern ideas like female emancipation in the workplace, individualism and female autonomy, and women's pursuit of pleasure and love. But they do not explicitly address FP and population control.

While 39% of adults in urban areas and 73% of adults in rural areas had four or less years of education in the 2000 Census, the number of households with a television had increased from 8% in 1970 to 81% in 2000, with nearly universal ownership in urban Brazil and nearly half in rural Brazil. "This spectacular growth in television viewership (compared to) slow increases in education levels...suggests that a wide range of messages and values, including important ones for development policy, have the potential to reach households through the screen as well as through the classroom."

¹⁵ Ana Maria Goldani, "What Will Happen to Brazilian Fertility," In the Proceedings of the Expert Group Meeting on Completing the Fertility Transition, March 11-14, 2002, UN Department of Economic and Social Affairs, Population Division, in New York City, USA.

¹⁶ Population Reference Bureau, "2001 World Population Data Sheet."

¹⁷ This section is based on and quotes heavily from the work of Eliana La Ferrara, Alberto Chong, Suzanne Duryea, "Soap Operas and Fertility: Evidence from Brazil," Inter-American Development Bank, October 2008.

VERY RAPID FERTILITY DECLINE IN CONCERT WITH DEVELOPMENT AND STRONG GOVERNMENT POLICY: THE EXPERIENCE OF CHINA AND IRAN

China

In just 30 years, the TFR in China fell from 5.8 in 1970, to 2.7 in 1978, to 2.2 in 2000¹⁸ and well below replacement in 2011 (TFR=1.5)¹⁹

Although the fertility transition in China began earlier among the urban educated elite, the dramatic drop in fertility resulted primarily from vigorous national FP programs.²⁰ These changes between 1970 and 1978 followed urban and rural FP programs that were based on the government's need to reduce population growth to meet basic needs and support economic development. As a result, China achieved an unprecedented three-child decline in the TFR between 1970 and 1978. Nevertheless, the government adopted the infamous "One Child Policy" in 1979 when leadership realized that the population would continue to increase as the large numbers of youth from the earlier period of more rapid population growth entered childbearing age. This national population policy also included abortion, sterilization, delayed marriage and coercive sanctions, including intense social pressure plus rewards for compliance. Further, the rapid decline of fertility in China—based on the national FP program policy—was reinforced by urbanization and increasing female participation in the non-agricultural labor force.

Iran

Based on a strong government policy on population and development, and a national commitment and comprehensive program support for FP, the TFR in Iran decreased from 6.3 in 1986, to 2.8 in 1996, to 2.2 in 2000 and to an estimated 1.9 in 2011.

"On April 1, 1979 Ayatollah Khomeini declared an Islamic republic with a new constitution. The religious leaders of the new Islamic republic, citing the Quran, encouraged early marriage and large families.²¹ Family planning programs implemented under the Shah were seen as undue western influences and were dismantled. Health officials were ordered not to advocate contraception."²² "And a traditional view of women as wife and mother prevailed."²³

"Incentives for each additional child remained in place through the 1980–88 Iraq-Iran War, when population growth was viewed as a strategic advantage."²⁴ "Despite losses in the war with Iraq, the increasing birth rate, declining infant and maternal mortality rates, and an influx of refugees

¹⁸ Sources include: Rutherford, et. al., "How Far Has Fertility in China Really Declined?" *Population and Development Review*, 31(1): 57-84, March 2005. Judith Banister, "Population Policy and Trends in China, 1978-83," *The China Quarterly*, No. 100, 717-741, December 1984. "The 2011 World Population Data Sheet," Population Reference Bureau.

¹⁹ Population Reference Bureau, The 2011 World Population Data Sheet.

²⁰ Lively, William and Ronald Freedman, "The Origins of the Chinese Fertility Decline," *Demography* Vol. 27, No. 3 (Aug., 1990), pp. 357-367.

²¹ Berson, Caroline, "The Iranian Baby Boom: Why the Islamic Republic has Such a Youthful Population," *Slate*, June 12, 2009. (http://www.slate.com/articles/news_and_politics/explainer/2009/06/the_iranian_baby_boom.htm)

²² Larsen, Janet, "Iran's Birth Rate Plummeting at Record Pace: Success Provides a Model for Other Developing Countries," *Earth Policy Institute*, December 2001, (<http://www.earth-policy.org/Updates/Update4ss.htm>)

²³ Vahidnia, Farnaz, "Case Study: Fertility Decline in Iran, Population and Environment, Original Paper," 2007, DOI 10.1007/s11111-007-0050-9.

(http://lake.k12.fl.us/1681201015121318897/lib/1681201015121318897/_files/iran_family_planning.pdf)

²⁴ Op. cit. 21.

from Afghanistan, the population of Iran was 55 million at the 1986 census—a 40% increase since the preceding census in 1976—the annual growth rate was 3.2%.”²⁵ “The total fertility rate in Iran was 6.3 children per woman in 1986.”²⁶

“A rapidly growing population, with more than half under the age of 20, and an increasing demand for food, education, housing and jobs posed an undeniable challenge to the government.²⁷ At that point, government officials changed policy and launched a comprehensive program to reduce population growth.”²⁸ Programming included:

- National media campaigns to educate the public on the costs and implications of population growth; and public education through all media on the social and economic impacts of population and on FP.
- Government officials consulted with economic experts and religious leaders in meetings throughout Iran.
- In 1988, a national seminar on population and development was held in Iran’s holiest city, Mashhad, to discuss the negative impacts of population growth on the national economy and people’s welfare.
- A national FP program was officially re-established in 1989. Population concerns, and the interactions among population, sustainable development and economic growth were fully integrated into national development plans that included targets for decreased fertility.
- The most senior religious leaders issued fatwas that declared contraception, including male sterilization, acceptable.
- To ensure contraception supply, the government established its own oral contraceptive and condom factories.
- The Ministry of Health (MOH) integrated FP into its national health care system. By 1998, 85% of the rural population had access to health care and FP, which were provided free of charge.
- The MOH organized community health and FP services around rural health centers linked to 15,000 “Health Houses,” each of which reached 1,500 persons. And each Health House employed a male and female villager (a *Behvarz*) trained in community outreach.
- To further promote community participation, the MOH started the Woman Health Volunteer (WHV) program in 1990, which spread across the country. Each WHV is trained to provide health and FP advice to 50 households.
- In rural areas, the government supported rural midwives to provide health and FP information.

²⁵ Op. cit 23.

²⁶ Abbasi-Shavazi, Mohamed Jalal, “Recent Changes and the Future of Fertility in Iran,” in United Nation Department of Economic and Social Affairs, Population Division, Report on the Expert Group Meeting on Completing the Fertility Transition, March 2002. (<http://www.un.org/esa/population/publications/completingfertility/2RevisedABBASIpaper.PDF>)

²⁷ Op. cit. 23.

²⁸ Ibid.

IV. MACRO CONDITIONS FOR FERTILITY CHANGE—THE NATIONAL SITUATION IN JORDAN

There several key variables in Jordan that are related to the potential for continued long-term fertility decline in relationship to development. These include the economy, current population growth, population age structure and dependency, residence (urbanization), mortality, fertility, in-migration, education, labor force participation and government policy.

THE ECONOMIC CONTEXT FOR DEVELOPMENT²⁹

USAID/Jordan's current strategy notes:

The Government of Jordan has made significant progress in economic reforms, and has taken important steps to advance social and political development. New jobs are being created, basic and higher education systems are being improved and realigned to meet the demands of the job market, the overall health status of Jordanians is good with the public health service delivery system reaching the majority of citizens, and new facilities and management systems are helping to address the enormous demands placed on Jordan's scarce water resources. However, despite these achievements Jordan faces difficult and persistent challenges. The fundamental development challenge is a growing imbalance between scarce natural resources and the jobs and economic growth needed to fuel Jordan's development and provide all Jordanians — including women, growing numbers of youth, and the urban poor—with opportunities to prosper and participate. The fundamental societal challenge is rising social conservatism and an associated “culture of shame”—cultural attitudes towards acceptable work for Jordanian women contribute to their low rates of participation in the workforce; unemployment among youth, poverty, and a dependence on third-country labor in many sectors of the economy.

Jordan's population, currently estimated at 6.2 million, is growing rapidly and projected to more than double in the coming 30 years. This rapid increase in population further compounds the problem of water scarcity and heavy dependence on imported energy. With 70% of Jordan's population under 30, it is estimated that 80,000 new jobs will be needed each year to avoid higher levels of unemployment and poverty. Already, the unemployment rate among youth between the ages of 15 and 24 years is estimated at nearly 60%. Youth have few safe social and recreational outlets, are not adequately engaged in positively shaping the environment around them, are prematurely led into adult roles, and have a heightened risk of delinquent behavior. Left unaddressed, Jordan's youth bulge is the largest potential source of political, social and economic instability.

Further, Jordan's youth are a major part of Jordan's newly recognized and growing cohort of urban poor. While Jordan's poverty rate stands at 14.2% and one-eighth of Jordan's population is below the poverty line, more than 60% of the poor live in cities. More than 80% of households reported a 25 to 50% increase in their food, energy and transportation expenditures over the past year. Though Jordan is an upper middle-income country and has made remarkable strides in developing its economy as a model for the region, the benefits of growth have not meaningfully translated into improved living conditions for the most vulnerable.

²⁹ This section directly quotes the USAID/Jordan Country Strategy: 2009-2014, January 28, 2010.

Further, the growing cities that house the majority of Jordan's poor are becoming increasingly stressed as they cope with the interlinked challenges of rapid population growth and resource scarcity. At the beginning of the global economic crisis in 2008, fuel prices hit record highs, severely stressing household budgets. Jordan imports 96% of its energy resources and is therefore much more vulnerable than its oil-rich neighbors to potentially destabilizing inflation when fuel prices spike. The country also remains severely water-poor, and struggles to balance policies and public engagement needed to manage demand in a sustainable fashion with ever-more costly solutions to increase supply.

Economic development efforts in Jordan suffer from the weakness of both public- and private-sector institutions. Governmental bodies need to develop into strong decision-making and regulatory institutions to manage issues effectively. Businesses are not fully poised to enter global markets in a significant way, hampered both by capacity and competitiveness gaps and by regulatory challenges.

Further challenges include persistent unemployment coupled with this poverty. The official unemployment rate is 12.5%, with jobs not being created fast enough to absorb the growing workforce. Although Jordan boasts high literacy and school completion rates and has made steady progress in increasing access to education and eliminating gender disparities, the quality of education remains uneven, particularly in poor areas. Graduates still lack the skills required in an evolving world and are under-prepared for 21st century jobs.

The rate of food insecurity is 4.5% in Jordan's cities and up to 11.3% in rural areas. Forty-four percent of households reported a disruption in their food consumption routine, with almost 88% of those reducing the overall quantity of food as a coping mechanism.³⁰ As water and jobs evaporate in rural areas, youth and families are migrating to already overcrowded neighborhoods in cities ill-equipped to manage the influx. Water and sanitation facilities, schools, hospitals, health clinics and social service providers are overburdened, and political representation is drawn disproportionately from tribal elites in rural areas. Left unaddressed, the intersection of unmet social and political demand with resource scarcity is a threat to Jordan's stability.

Jordan's reliance on energy—of which 96% is imported—is a heavy drain on public and private resources. Significant increases in the cost of petroleum products in 2008 coincided with the removal of subsidies. Meanwhile, consumers faced five-year fuel increases of over 300%. This convergence of events has helped stimulate interest in energy conservation and the rapid development of Jordan's energy sector, including renewable sources of power.

Jordan also faces a growing deficit, reaching 12.1% of gross domestic product (GDP) in 2008; with significant internal debt of JD 5.7 billion or 40.6% of GDP; external debt of JD 3.6 billion or 25.7% of GDP; and massive budgetary expenditures of 38.2%.³¹ The GOJ looks to donors to alleviate these pressures via loans and debt relief, though it recognizes the need to implement stronger macroeconomic policies to shore up the country's economy against regional and global economic downturns.

³⁰ Food Security Survey in Poverty Pockets, World Food Programme, 2008.

³¹ Central Bank of Jordan, 2008.

POPULATION GROWTH

The Jordan Population and Family Health Survey in 2009 (JPFHS 2009) reported that the total population is growing at 2.2% per year,³² which would double the number of Jordanians to 13 million by 2040 (i.e. in 31 years). This estimate of population growth is based on the assumption that high fertility and low mortality will continue and net immigration will be relatively small.

POPULATION AGE STRUCTURE AND DEPENDENCY

The JPFHS 2009 reported a young age structure (37% under age 15), which produces a dependency ratio³³ in Jordan that is relatively high compared to World Bank³⁴ estimates for other countries in 2009 (e.g., Egypt = 58; Lebanon = 48; Tunisia = 44). The young age structure and population momentum in Jordan means a “demographic opportunity” could not be realized for at least 15 years, even if the fertility level in Jordan were to drop dramatically and suddenly, which is not likely.

POPULATION AND RESIDENCE

Jordan’s Department of Statistics (DOS) estimated the total population in 2012 at 6.3 million,³⁵ with most Jordanians living in urban areas (84%) of 5,000 people or more. Most (71.4%) of the population is concentrated in three governorates: Amman (38.7%), Irbid (17.8%) and Zarqa (14.9%) (see Table I).

Governorate	Estimated Population	Percent
Amman	2,516,800	38.72
Balqa	435,500	6.70
Zarqa	968,500	14.90
Madaba	162,500	2.50
Irbid	1,157,000	17.80
Mafraq	305,500	4.70
Jarash	195,000	3.00
Ajlun	149,500	2.30
Karak	253,500	3.90
Tafiela	91,000	1.40

³² Department of Statistics [Jordan] and ICF Macro, 2010, “Jordan Population and Family Health Survey 2009,” Calverton, Maryland, USA.

³³ The Dependency Ratio is the ratio of the population in the non-productive ages (i.e., ages 0 to 14 plus ages 65+) to those in the productive ages 15 to 64.

³⁴ World Bank data: <http://data.worldbank.org/indicator/SP.POP.DPND>

³⁵ Government of Jordan Department of Statistics website: www.dos.gov.jo

Table 1. Estimated Number and Percentage of Population in Jordan in 2012 by Governorate		
Governorate	Estimated Population	Percent
Ma'an	123,500	1.90
Aqaba	141,700	2.18
TOTAL	6,500,000	100.00

Source: The % distribution by governorate is from the GOJ DOS report: "Estimated Population of the Kingdom by Governorate and at Year End 2011." The total population in 2012 is from the "Population Projection for 2012" on the GOJ DOS website.

MORTALITY

Jordan's population is growing rapidly because high fertility level is accompanied by low mortality. The crude death rate (CDR) in Jordan is estimated at four per 1,000 people.³⁶ As a comparison, Europe's CDR is 11 per 1,000 people because it has a much older age structure. Jordan's low CDR is also due to the young age structure of the population where virtually 100% of births are attended and nearly all children are immunized. Along with high fertility, Jordan has a relatively low infant mortality rate (IMR) at 23 per 1,000 live births—this rate is high compared to the more developed countries where the IMR is 5 per 1,000 live births but it is low compared to the world average, which is 44 per 1,000 live births. The MOH offers free vaccinations against childhood diseases to Jordanian and non-Jordanian children during the first 18 months of life; the National Vaccination Programme (NVP) was launched in 1979. The coverage rate is over 90% and the Kingdom is free of polio, neo-natal tetanus and diphtheria, while pertussis and mumps are under control and Jordan is almost free of measles. Because infant mortality is low in Jordan, it is unlikely that couples choose to have many children to insure that they can achieve their desired family size.

FERTILITY

The Total Fertility Rate in Jordan (i.e., the average number of children a woman has during her lifetime) declined remarkably in less than two generations from 7.4 children per woman in 1976 to 3.7 children per woman in 2002, where it has stabilized. Although the TFRs recorded in the JPFHS were different in 2002 (TFR=3.7), 2007 (TFR=3.6) and 2009 (TFR=3.8), there was no statistically significant difference among them. Nor was there a statistically significant difference in the TFR in 2009 for urban women compared to rural women or among the three regions of Jordan. Women with the highest levels of education do have lower fertility and it does appear to decrease as wealth increases.

³⁶ World Population Data Sheet 2011, Population Reference Bureau, Washington, D.C., USA.

NET MIGRATION³⁷

Both the size and structure (age and sex) of a population can be dramatically and rapidly affected by net migration; and the costs and burdens of in-migrants can have a significant and almost immediate impact on the economy depending on the numbers and needs of the migrant population. In this report, as we look at the relationship between population growth and fertility, we assume that there will be no significant net in-migration or outmigration and that all population growth will result from natural increase (i.e., the net of births and deaths).

EDUCATION

The GOJ requires that all children attend school from age 6 to 16. As a result, only 1.3% of the ever-married women in the JPFHS 2009 had no education. However, the survey showed that women in rural areas (8.3%), the poorest (8.9%) and the oldest (8.3%) were most likely to have no education.

LABOR FORCE³⁸

Most (85%) of the ever-married women included in the JPFHS 2009 had not worked outside the home. These data are reinforced by the most recent GOJ data on the “Refined Economic Participation Rate” (the labor force attributed to the population aged 15 years and over), which was 62.4% for males and 14.9% for females. Because the literature suggests that fertility behavior is closely linked to women’s opportunities to work in the non-agricultural sector, it is important to note the characteristics of female employment reported by the GOJ:

- The unemployment rate among women (18.3%) is higher than men (10.7%).
- Both the employed males and the employed females were concentrated in the age group 20 to 39 years (male=62.7%; female=73.6%).
- A quarter (24.9%) of the total employed work in the sector of public administration, defense and social security.
- Slightly more than half (55.8%) of employed females are professionals and 13% were technicians and associate professionals; 40.6% of female workers were in the education sector and 13.7% in the health sector and social work.
- More than half (56.5%) of the total labor force among females has a bachelor level (degree) or higher, compared with 21.4% for males.

These employment data not only show limited overall economic participation by Jordanian women, but they also indicate that the opportunities and options for working women are limited and are mostly available to those who are highly educated and who can work in the professions.

³⁷ Net migration for a given geographic is the difference between immigration (or in-migration) and emigration (or out-migration) during a specified time frame. Net migration can either be positive or negative. Positive net migration indicates net immigration, while negative net indicates net emigration – US Bureau of the Census, “Domestic Net Migration in the United States: 2000 to 2004,” April 2006.

³⁸ Unless otherwise noted, this section quotes from the GOJ DOS, “Quarterly Report on the Unemployment Rate for the 4th Quarter of 2011,” released January 4, 2012.

GOVERNMENT POLICY

Over the past several decades, the GOJ in principal has recognized that population growth is an important issue for the development of the country. The GOJ established the National Population Commission (NPC) in 1973, and it stated in the National Population Strategy (NPS) that by the year 2020, the goal is “to contribute to a sustainable base for economic development through a decrease in the nation’s total fertility rate to less than 2.5 children per woman of reproductive age.” The GOJ also established the Higher Population Council (HPC) in 2002 to coordinate the national response to population growth. In that role, the HPC has led the development of the first Reproductive Health Action Plan (2003–2007), the current Reproductive Health Action Plan, Stage II, 2008–2012 and seeks to achieve replacement fertility (TFR=2.1) by 2030. The HPC has also highlighted the possibility of a “demographic opportunity” for accelerated economic development if Jordan experiences a rapid fertility decline to TFR=2.1; and it published the Demographic Opportunity paper in 2010. In addition to approving policies and establishing institutions, the GOJ has also responded to population growth by providing free FP services at most of the MOH health care facilities. Furthermore, the GOJ, through the MOH, procures FP commodities independent of international donors and makes them available at no cost to the United Nations Relief and Works Agency (UNRWA)³⁹ and Royal Medical Services facilities. However, the GOJ scarcely mentions the need for decreased fertility nor does it mention FP in the National Agenda (issued in 2009), the GOJ’s comprehensive policy statement on economic and social development.

³⁹ The United Nations Relief and Works Agency for Palestine Refugees

V. MICRO CONDITIONS FOR FERTILITY CHANGE AT THE HOUSEHOLD LEVEL IN JORDAN⁴⁰

There are no good household-level data sets available to directly analyze the relationship between fertility and economic factors in Jordan. Therefore we will consider the determinants of fertility at the micro-level and then assess expected impact on fertility decline in Jordan. These factors include an array of “intermediate variables” related to fertility and the “proximate determinants of fertility.” These variables suggest a mixed impact on fertility in Jordan—some are related to lower fertility and others would predict higher fertility (see Table 2). In Jordan however, the fertility impact of several of these variables does not appear to behave as expected based on other countries’ experience. For example, the standard definition of a high status woman (educated and engaged in economic activity) predicts that fertility will decline as a woman’s status increases. However in Jordan, high status is given to a woman who stays home, has children and takes care of her family—so high status predicts higher fertility.

Table 2. The Expected Impact of Selected Intermediate Variables on Fertility at the Household Level from the Literature and in Jordan		
Variable	Expected Impact on Fertility	Impact on Fertility in Jordan
Status of Women	Negative	Positive
Demand for Children (Ideal Family Size)	Positive	Positive
Monetary Cost of FP	Positive	Limited
Age at Marriage	Negative	Limited
Proportion Married	Positive	Limited
Marital Fertility Rate	Positive	Positive
Access to All Methods of Contraception	Negative	Negative
Duration of Post-Partum Infertility (Lactation)	Negative	Limited
Knowledge of FP	Negative	Negative
Contraceptive Prevalence	Negative	Negative
Unmet Need for FP	Positive	Limited
Discontinuation of FP	Positive	Limited
Method Mix	Negative	Limited
Missed Opportunities for FP	Positive	Positive
Family, Religious and Community Values	Positive or Negative	Positive

⁴⁰ The primary source for, and the quotes in this section, unless noted, is the Department of Statistics [Jordan] and ICF Macro, 2010, “Jordan Population and Family Health Survey 2009,” Calverton, Maryland, USA.

STATUS OF WOMEN

Education and economic activity are generally defined as two main determinants of women's status and commonly considered as main determinants of fertility decline and demographic transition.⁴¹ Therefore, changing women's status through increased education, labor force participation, delayed marriage and gender equity is associated with a decline in TFR. But in Jordan, a woman's status is primarily focused on her role as a wife and mother within the household, extended family and community. Because there are limited options for female employment, there is little financial opportunity cost to the household if the woman does not seek to work for wage income outside the home. Therefore a woman's status, as defined in Jordan, is associated with higher fertility.

DEMAND FOR CHILDREN (IDEAL FAMILY SIZE)

The ideal number of children is a key variable that impacts the TFR in Jordan. Jordanian women's mean ideal number of children is closely related to their fertility behavior. Like the TFR, this indicator has not changed since 2002. When the TFR=5.6 in 1990, the ideal number of children was 4.4. In 2009, the TFR=3.8 and was slightly lower than the ideal number of children of 4.2. Although there appears to have been a decrease in the ideal number of children from 2002 to 2007 (4.231 to 3.948) and followed by a slight increase in 2009 (4.162), there has been no statistically significant change in this measure during the past 10 years. Furthermore, the ideal number of children among ever-married women in 2009 was very consistent at about four children across all parity groups (P=number of living children: P0=3.7, P1=3.5, P3=3.9, P4=4.3, P5=4.6, P6=4.9). The exception was women with more than four children who reported a higher ideal number. This ideal family size of about four children in 2009 was very consistent by location, region and wealth. However, as expected based on the literature, the ideal number of children did appear to decrease as the level of education increased (see Table 3). This high average ideal number of children (4.2) in the JPFHS 2009 is confirmed by the preliminary findings from MOH's ongoing Sentinel Survey of married women aged 15–49 across 35 MOH Health Centers in 11 health directorates.⁴² The mean ideal family size among the women in this survey, who are all currently using FP, is 4.4 children.

⁴¹Amir H. Mehryar, Amir H. Institute for Research and Development Planning Tehran, Iran, and Akbar Aghajanian, Department of Sociology, Fayetteville State University, Mohamad Tabibian and Farzaneh Tajdini, Institute for Research and Development Planning, Tehran, Iran, "Women's Education and Labor Force Participation and Fertility Decline in Iran," February 2002.

⁴² These preliminary data are provided by Dr. Ali al Arbaji, USAID/Jordan, who is advising the Ministry of Health.

Table 3. Total Fertility Rate and Ideal Family Size in Jordan in 2009 by Region, Governorate, Location (Urban, Rural and Kingdom), Education, and Wealth		
Variable	Total Fertility Rate	Ideal Family Size
Location		
Urban	3.8	4.1
Rural	4.0	4.4
Total	3.8	4.2
Region		
North	4.0	4.3
Central	3.8	4.1
South	4.1	4.2
Governorate		
Amman	3.7	4.1
Balqa	3.9	4.2
Zarqa	3.9	4.1
Madaba	3.6	4.3
Irbid	3.8	4.2
Mafraq	4.2	4.4
Jarash	4.5	4.4
Ajlun	4.0	4.3
Karak	3.8	4.0
Tafiela	4.3	4.2
Ma'an	4.3	4.4
Aqaba	4.2	4.3
Education		
None	4.1	4.9
Elementary	4.1	4.5
Preparatory	4.7	4.2
Secondary	4.1	4.1
Higher	3.5	4.0
Wealth Quintile		
Lowest	4.9	4.3
Second	4.4	4.3
Middle	3.9	4.1
Fourth	3.6	4.1
Highest	2.7	4.0

Source: Department of Statistics [Jordan] and ICF Macro, 2010. Jordan Population and Family Health Survey 2009. Calverton, Maryland, USA: Department of Statistics and ICF Macro.

MONETARY COST OF FAMILY PLANNING

As the monetary cost of FP increases the fertility level is also expected to increase. However, this does not appear to be the case in Jordan because FP is provided free by the GOJ within the MOH system of hospital and clinics that cover the country, although every method is not always available in every MOH location. The government also provides free contraceptives to the non-governmental organization (NGO) sector.

HOUSEHOLD SIZE, INCOME AND EXPENDITURES

The GOJ's current data on household income and expenditures⁴³ show that the average household has 5.3 members (5.2 urban; 5.8 rural) who share a total average income of JD 8,824 per year (JD 9,010 urban; JD 7,848 rural) (see Table 4). This works out to an average income of JD 138 per month per household member, with JD 144 per month per household member in urban areas and JD 113 per month per household member in rural Jordan (see Table 5).

However, income does not have a normal distribution in Jordan so the average values could be misleading. Although the average household income is JD 8,824 per year, the median household income is lower at JD 5,700–6,500 per year. Similarly, the Jordan DOS reports that the average annual expenditure per household in the Kingdom is JD 9,626 (see Table 4), but GOJ data also report that the median household expenditure is lower at JD 7,000–8,000 per year. Comparing both average and median values, it appears that annual expenditures per household are greater than annual income which most likely results from underreporting of income. While they should be viewed with caution, these income and expenditure data indicate that most Jordanians are just getting by and can be expected to be very sensitive to increased costs of living. However, the impact of income on fertility appears to be mitigated by government subsidies and emergency transfers from the extended family.

Governorate	Households	Household Members	Members per Hhold	Income per Yr - JD	Expenditure per Yr - JD
Amman	461,130	2,321,877	5.0	10,619	9,542
Balqa	76,419	403,494	5.3	7,135	8,141
Zarqa	169,818	909,653	5.4	7,298	8,119
Madaba	27,855	153,226	5.5	6,912	8,027
Irbid	194,667	1,078,523	5.5	7,877	8,639
Ma'raq	47,820	283,179	5.9	7,276	7,675
Jarash	30,252	175,706	5.8	7,946	9,542
Ajlun	24,495	139,943	5.7	7,470	7,529
Karam	41,796	232,413	5.6	8,968	9,652
Tafiela	15,661	83,231	5.3	7,418	6,918
Ma'an	20,101	116,175	5.8	7,514	6,891
Aqaba	24,163	130,524	5.4	7,755	8,011
Urban	952,790	4,977,342	5.2	9,010	8,297
Rural	181,387	1,050,601	5.8	7,848	9,721
TOTAL	1,134,177	6,027,943	5.3	8,824	9,626

Source: Government of Jordan, Department of Statistics, "Household Income and Expenditure Survey 2010"

⁴³ GOJ DOS website, "Household Income and Expenditure Survey 2010." www.dos.gov.jo

Table 5. Average Annual Income and Expenditure per Household Member in Jordan in 2010 by Location (Urban, Rural and Kingdom)				
Location	Income Per Year	(JD) Per Month	Expenditure Per Year	(JD) Per Month
Urban	1,725	144	1,588	132
Rural	1,355	113	1,678	140
TOTAL	1,660	138	1,811	151

Source: Computed from GOJ DOS "Household Income and Expenditure Survey 2010"

GOVERNMENT OF JORDAN SUBSIDIES

While household income in Jordan is not especially strong—especially compared to expenditures—its expected negative impact on the demand for children is mitigated by a wide range of GOJ subsidies: food, cooking gas, water and energy. Government services such as health and education are also subsidized, and there are housing programs designed to benefit the poor. As mentioned earlier, contraceptives in Jordan are provided free of charge by the MOH, as well free vaccinations against childhood diseases to Jordanian and non-Jordanian children during the first their first 18 months. Public education is also very inexpensive. The GOJ charges JD 3.7 per child per year for primary school (first through sixth grades) to cover uniforms, textbooks and school fees; secondary school (seventh through twelfth grades) cost JD 7 per child per year. School principals are authorized to exempt those in need. Further, the GOJ provides tax subsidies by exempting selected items from the sales tax and there is no income tax on incomes under JD 2,000 per year. To improve the equity of the subsidy structure in Jordan, the government has considered reducing subsidies and moving to cash transfers to the poor. However, this shift would, in effect, increase household income, and reduce the economic disincentives to limit fertility among the poorest and least educated—especially if benefits to the poor were determined by family size. In addition to GOJ subsidies, the extended Jordan family further provides the household with a "safety net" in times of hardship.

"Due to the recent change in government (the Prime Minister resigned) the government announced that it will delay a planned increase in electricity rates 'due to the political sensitivities surrounding the move.' The National Electricity Power Company has an annual deficit estimated to reach JD 1.7 billion by the end of 2012. This is in response to a series of disruptions to Egyptian gas supplies that have forced the country's power plants onto heavy oil and gas reserves at the cost of JD 5 million per day. According to the Electricity Regulatory Commission (ERC) the switch has pushed NEPCO's electricity generation costs to some 184 fils (JD 0.184) per kilo-watt hour, more than twice the 73 fils/kWh rate at which it sells power to consumers."— *Jordan Times*, April 30, 2012

AGE AT MARRIAGE, PROPORTION MARRIED AND MARITAL FERTILITY

Because marriage is virtually universal in Jordan, and pregnancy outside of marriage is almost unknown, the TFR serves as a good indicator for the Marital Fertility variable in economic models. The JPFHS 2009 found that 95.5% of women were currently married. The government requires both males and females to be at least 18 years in order to marry and the median age of

first marriage for females is 22.4 years in both urban and rural Jordan; and thus pregnancy and childbirth become possible. There is little variation by region, but women with no education are the youngest to marry. While increasing the age at marriage leads to lower fertility in most populations, this would not be expected in Jordan. Because the fertility transition is advanced in the Kingdom, even with a higher age at marriage than 22.4 years and a TFR=3.8, the average woman could easily have her children by age 33.5—even with three-year birth spacing. Increasing the age at marriage to 25 years still allows a woman to have her 3.8 children by age 36, well within the childbearing age group.

ACCESS TO CONTRACEPTION

Although FP services are available throughout the Kingdom, abortion is illegal, sterilization is not provided in the public sector, and there is limited availability of long-term methods. The majority (46%) of women who are using FP obtain their supplies and services in the public sector; about a third (34.2%) rely on the commercial private sector; and the balance are served by the Jordan Association of Family Planning and Protection (12.1%); and the UNRWA medical services (7.7%).

The MOH provides all FP methods supported by the GOJ logistics system (IUDs, combined oral contraceptives, progestin-only oral contraceptives, condoms, implants and 3-month injectables) if trained medical doctors are available in the MOH facility. But only a trained female MOH physician may insert an IUD in the MOH system, which restricts the availability of the IUD option due to the limited numbers of female medical doctors. An MOH physician must write the first prescription for an oral contraceptive or condoms provided in the MOH system, but refills can be approved by a trained nurse or midwife. Therefore MOH staffing is a challenge to effective FP programs in the public sector. And the MOH loses experienced and trained physicians to the private sector due to more favorable income opportunities in Jordan and abroad; and many MOH physicians are reluctant to work in remote areas.⁴⁴

Although services and methods are generally available, there are a number of impediments: clinics are often crowded; female doctors are limited (a factor for conservative women); supplies are sometimes out of stock; providers (especially in the public sector) have little time with each patient; providers (doctors and nurses) are often biased (in favor or against specific methods); and many providers refuse to prescribe contraception to women with fewer than two children especially if one is not a boy.

The critical issue in Jordan is not access to contraceptives in general—rather it is the need to expand access to all methods, especially to effective long-term modern methods, at all times and in all locations. These circumstances that limit easy access to contraception can be viewed as a “cost” to women who desire to limit their fertility and are expected to have some impact on the TFR.

BREASTFEEDING

Only 1.5% of currently married women who are using FP rely on the Lactational Amenorrhea Method (LAM) for contraception. This is confirmed by the low median duration of postpartum amenorrhea (3.5 months), which the JPFHS 2009 notes “is directly related to the duration and intensity of breastfeeding.” This limited practice of breastfeeding is expected to increase fertility in Jordan.

⁴⁴ Douglas Heisler and Abel, E., “Opportunities to Reduce the Total Fertility Rate in Jordan,” unpublished paper, December 2009.

KNOWLEDGE OF FAMILY PLANNING

The JPFHS 2009 reports almost universal knowledge of FP in Jordan. All (99.9%) of currently married women reported knowing about some method of birth control. However, only 68.8% knew about implants and injectables (88.6%), both of which are hormonal methods that have proved very successful in other country FP programs. The extent to which married women in Jordan actually understand how to use each method, the side effects and efficiency of each method may leave room for improvement, especially because little counseling is provided in public-sector facilities.

Six focus groups were held in the summer of 2008 with MOH 51 FP providers (12 GP physicians, 13 OB/GYN specialists and 26 midwives) in Amman, Karak and Irbid. Key findings include: service providers do not have full data on FP; service providers are not convinced about the concept of small family size; service providers' religious beliefs and personal social concepts influence their provision of FP services, including method selected and when a woman should begin using a method. For example, hormonal methods should be used by women who have their desired number of children, while newly-married women and women with one child should use short-term or traditional methods of FP because it is believed that IUDs can affect the fertility of newly-married women and women who have one child.⁴⁵

CONTRACEPTIVE PREVALENCE RATE (CPR)

More than half (59.3%) of married women use contraceptive, including 42% who use a "modern method"⁴⁶ and 17.2% who use a "traditional method."⁴⁷ The CPR is higher in urban areas (CPR=60.4) than rural (CPR=53.2). The data suggest that the use of modern contraception increases with wealth and education. The data indicate that the use of modern contraception increases with education and wealth.

UNMET NEED FOR FAMILY PLANNING

In Jordan, married women aged 15–49 have a low unmet need for FP. Examining this key variable for fertility decline shows that only 6.5% of women expressed an unmet need for FP to limit births. An additional 4.7% expressed an unmet need to space births. This unmet need for limiting fertility is highest among older women and the lower educated. The overall unmet need in Jordan (11.2%) is comparable to many other DHS countries with the same CPR as Jordan (59.3%); for example, Morocco (10%:63%), Turkey (10.1%:63.9%) and Zimbabwe (12.8%:60.2%).

DISCONTINUATION

Because 45.1% of Jordanian women who begin using contraceptives discontinue within 12 months, addressing this issue may offer an opportunity to decrease fertility. However, discontinuation is not absolute and most women readopt FP relatively quickly each time they discontinue using contraception. Reasons for discontinuation during the five years before the JPFHS 2009 indicate possible program directions. For example, 17.1% of FP users discontinued because the method failed (i.e., they became pregnant unintentionally). Another 20.9%

⁴⁵ Health Systems Strengthening Project (HSS). July 2008. Knowledge, Attitude and Practice of Family Planning among Public Sector Health Care Providers in Jordan. ABT Associates, Bethesda, Maryland, USA.

⁴⁶ JPFHS 2009: "Modern" contraceptive methods: female sterilization, pill, IUD, injectable, implant, male condom (forms were available in the 1500s and the latex condom was invented in the early 1900s), female condom and extended breastfeeding or LAM, which has been used for centuries.

⁴⁷ JPFHS 2009: "Traditional" contraceptive methods: periodic abstinence, withdrawal and undefined "folk methods."

discontinued using FP because they were concerned about side effects (11.5%) or worried about their health (9.4%). Concerns about side effects and health were especially true for the most effective methods: the pill (37.6%), the IUD (39.2%) and injectables (66.6%). On the other hand, 12.6% of FP users discontinued using contraceptives because they wanted a more effective method and this reason was most pronounced for the least effective methods: condom (12.5%), LAM (45.4%), periodic abstinence (14.1%) and withdrawal (14.1%). These data suggest that the focus should be on those women who discontinued use because of method failure; who wanted a more effective method; and who might be convinced to use a more effective method if they receive counseling and support. Service providers often do not provide full information on side effects and complications of a desired method, which contributes to discontinuation.

In a 2007 study⁴⁸ of all female physicians (117) and a sample of midwives (138) working at MOH PHC and 58 FP clients in all health directorates, the physicians scored 68.4% and the midwives 75.4% on questions about the side effects of FP methods, including providers who had been trained in FP side effects. For example, 48% of physicians and 70% of midwives knew that irregular bleeding was an IUD side effect. In a case study exercise, 10% of the physicians and 18% of the midwives advised discontinuation in response to normal side effects. Among the FP patients, 35 to 40% of clients had not been informed about the side effects by method when they adopted the method or told what to do in the event of side effects.

METHOD MIX

The most popular methods include IUD (22.6%), withdrawal (12.8%), pill (8.2%), male condom (6.3%), and periodic abstinence (4.0%). It is noteworthy that the most used contraceptives in Jordan are not always the most effective—for example, withdrawal, the male condom and periodic abstinence. Married women rarely use the most effective methods: female sterilization (2.6%), injectables (0.7%), implants (0.1%), and abortion is illegal. Further, there has been a trend in Jordan among women who are using FP to shift from more effective to less effective methods, mainly due to a fear of side effects and health concerns, which may contribute to the plateau of the TFR.

MISSED OPPORTUNITIES

Increased knowledge about the benefits and side effects of various FP methods would help women to choose the right method to fit their circumstances, while reducing discontinuation and fertility. However, providers often do not have the time, interest or training to provide adequate counseling to their patients.

In principle, every woman who visits a health facility for any reason (e.g., antenatal and postnatal visits, children's immunizations, premarital exams and other regular visits to a public health facility) should be offered FP counseling or materials to take home, but this does not happen and remains a missed opportunity to reach women.

Preliminary data from an ongoing exit survey of women aged 15–49, who visited MOH primary health centers for any reason and who were not currently using FP, show that 80% either received no FP counseling (65%) or only partial counseling (15%). All participants emphasized

⁴⁸ Bitar, Nisreen. September 2008. MOH Service Providers Knowledge on how to Manage IUDs & OCs Side Effects. The Health Systems Strengthening project, ABT Associates, Bethesda, Maryland, USA.

the importance of privacy during FP counseling, but noted many obstacles to privacy, especially the lack of space in MOH facilities.⁴⁹

A 2007 survey of 12 MOH hospitals revealed an immense need for improved FP services among the hospitals. It showed that post-abortion cases were the second most frequent cause of admission to obstetric departments in MOH hospitals; no FP services were provided immediately post-abortion; most hospitals lacked space to store or manage FP commodities; information and education communications (IEC) materials were not available to inform clients about contraceptive methods; mechanisms did not exist to refer OB/GYN patients from hospitals to FP clinics for post-abortion care services; and the service providers in 83% of the hospitals required training in FP counseling and service provision. Most service providers said that they did not provide adequate FP counseling because they did not have the time due to work pressures, and all respondents emphasized the importance of privacy during FP counseling and noted many obstacles to privacy, especially the lack of space in MOH facilities.⁵⁰

It should be noted that USAID/Jordan has assisted the GOJ to renovate the leading hospitals in each governorate—by the end of 2013, all MOH hospitals will have a post-partum, post-miscarriage program to provide FP services at the secondary-care level prior to discharge. The renovation program also includes space for FP commodities as well as private space for counseling.

FAMILY, RELIGIOUS AND COMMUNITY VALUES

A 2006 study⁵¹ on birth spacing in North and South Jordan included 12 focus groups with married males and females aged 18–40; all had one to three children, one of whom was under age 5. The study found that both men and women experience near constant pressure to have a baby soon after marriage, which often led the couple to have a baby within 18 months of marriage. It also found that fertility is highly prized and is associated with high status and social standing, while being infertile led to ridicule. Hence, couples rush to have first child to establish their standing in the community. In the case of infertility, women were generally viewed as responsible and were more stigmatized than the man for the lack of a child. The study concluded that the key motivators to birth spacing were the high cost of living and raising a child, better quality child care, a mother's health and needs and improved quality of life as a couple. Key barriers to birth spacing included family and societal pressure; a conservative 'tribal' mindset, including religious beliefs that "when a child is born his fortune is provided by God" and the Prophet's direction "to have as many children as we can (so that the Prophet will be proud of us on resurrection day (p. 45));" late marriages and pressure to complete the family as soon as possible; and limited knowledge on contraception and the fear of side-effects.

Most (96%) of the 1,880 Muslim leaders in Jordan (Imams who lead Friday prayers and *Khatibs* who deliver the Friday sermon) are government employees; 1,594 male and 61 female religious

⁴⁹ Health Systems Strengthening Project (HSS). July 2008. Knowledge, Attitude and Practice of Family Planning among Public Sector Health Care Providers in Jordan. ABT Associates, Bethesda, Maryland, USA.

⁵⁰ Hamza, Sabry. 2008. An Assessment of Post-Abortion Care Services in MOH Hospitals in Jordan. Health Systems Strengthening Project (HSS). Abt Associates, Bethesda, Maryland, USA.

⁵¹ Market Research Organization (MRO). June 2007. A Qualitative Exploratory Study to Understand Birth Spacing Issues in Jordan—Final Report. Johns Hopkins Health Communications Project, Amman, Jordan.

leaders were interviewed in a 1997 survey on FP.⁵² Most religious leaders consider FP to mean birth spacing (M: 87%; F: 83%) and most believe that FP is acceptable within Islam (M: 82%; F: 98%). Very few responded that FP is *haram* or forbidden (M: 5%; F: 0%), but they do not believe that permanent or irreversible methods are permitted in Islam except when the woman's life is in danger. About half of religious leaders believed that a family with only girls should continue until they have at least one son. On the scale measuring agreement with a preference for large families (more than four children), religious leaders scored below the midpoint in which "0" = does not agree and 10 = strongly agrees (M: 4.6; F: 3.5). A high percentage of religious leaders who recognized a specific traditional FP method believed that the method is approved within Islam because it does not threaten the mother's health and has few side effects: withdrawal (M: 80%; F: 95%); breastfeeding (M: 95%; F: 100%); and safe period (M: 86%; F: 96%). A much lower percentage of religious leaders who recognized a modern method believed they were acceptable, again due to the perception that they were less safe and had more side effects for women: pill (M: 44%; F: 74%); IUD (M: 61%; F: 70%); injectables (M: 33%; F: 46%); and tubal ligation (M: 18%; F: 22%). Finally, while religious leaders approved the use of short-term and reversible methods to preserve the health and safety of women, they did not approve of FP for economic reasons.

⁵² Underwood, Carol. September 2000. Islamic Precepts and Family Planning: The Perceptions of Jordanian Religious Leaders and their Constituents. *International Family Planning Perspectives*, 2000, 26(3): 110-117 & 136. Guttmacher Institute, New York, New York, USA.

VI. THE IMPACT OF FERTILITY DECLINE AT THE NATIONAL (MACRO) LEVEL

If fertility in Jordan were to decline quickly, all other things held constant, it can be assumed that the government would have additional resources to meet current obligations and invest in physical infrastructure and human capital needed to realize the benefits of the related “demographic opportunity.” Of course, this positive scenario assumes that savings from the population decrease are not eroded by inflation and that there are no unanticipated or costly external or internal circumstances.

USAID/Jordan in consultation with the GOJ’s HPC has applied the Resources for the Awareness of Population Impacts on Development (RAPID) model⁵³ to estimate the impact of fertility decline in Jordan. RAPID is a computer model that was developed by the Futures Group International⁵⁴ with support from USAID to “project the social and economic consequences of high fertility and rapid population growth for such sectors as labor, education, health, urbanization, and agriculture. This program is used to raise policymakers’ awareness of the importance of fertility and population growth as factors in social and economic development. The model combines socio-economic factors—such as labor force participation, primary school enrollments and number of nurses per capita—with demographic information and population projections (and costs by sector) to estimate impacts (of fertility decline) up to 30 years into the future. RAPID analyses have been presented to cabinet-level officials in more than 40 countries and 15 heads of state. In many countries, advocacy using RAPID has led to policy and programmatic change.⁵⁵ The national-level RAPID model has been presented to senior government officials in Jordan and is being adapted by the Futures Group International with USAID/Jordan support to raise the awareness of officials at the governorate level about the impact of population growth.

JORDAN POPULATION AND DEVELOPMENT—THE 2011 RAPID MODEL⁵⁶

The most recent RAPID model for Jordan was prepared in 2011 by a team from the Futures Group International with funding from USAID/Jordan’s Health Policy Initiatives activity. The model uses the most recent input data from the GOJ. The base year population in 2010, estimated by the Futures Group International, was also based on GOJ data. The 2011 RAPID model presentation began with the statement of three principles:

1. Because of Jordan’s current young age structure, the country’s population will continue to grow in the future regardless of anything that is done about fertility in the short term.
2. This population growth will have an impact on Jordan’s future development in a number of ways, many of which have significant consequences.

⁵³ The USAID Health Policy Initiative, “The RAPID Model: An Evidence-Based Advocacy Tool to Help Renew Commitment to Family Planning Programs, July 2009.

⁵⁴ See The Futures Institute website ‘<http://www.futuresinstitute.org/pages/Spectrum2.aspx#rapid>’

⁵⁵ The USAID Health Policy Initiative, “The RAPID Model: An Evidence-Based Advocacy Tool to Help Renew Commitment to Family Planning Programs, July 2009.

⁵⁶ Edward Abel, “Jordan Population and Development,” December 11, 2011.

3. Finally, there are specific actions that can be taken that will affect the future rate of population growth.

The 2011 Jordan RAPID model included two scenarios of fertility change over 30 years:

1. Scenario 1 assumes that Jordan's TFR of 3.8 children per woman in 2009 would remain constant to 2040.
2. Scenario 2 assumes that the TFR will decrease according to the GOJ's national goals—from 3.8 in 2010 to 2.5 in 2017 to replacement fertility of 2.1 in 2030 and remain at that level to 2040.

Basic inputs include:

- In 2009, Jordan's population was about 5.9 million.
- The average number of births per woman throughout the country was 3.8.
- The crude birthrate was 29 per 1,000 population.
- The CDR was 7 per 1,000 population, among the lowest in the world.
- The natural growth rate of the population was 2.2%.
- Life expectancy at birth in Jordan was 72 years for males and 74 years for females.
- Jordanian society was youthful—about 36% of it is under age 15.
- In 2009, there were approximately 172,529 births in Jordan.
- Net immigration is assumed to be zero.

THE 2011 RAPID MODEL OUTPUTS

The outputs from the RAPID model show the expected changes in key variables between the base year of 2009 and the target year of 2040 (see Table 6).

Variable	Base Year 2009	Constant Fertility (2040)	Fertility Decline (2040)	Reduction with Fertility Decline 2009–2040
Births	172,529	345,610	181,494	2.6 million fewer births 2009-40
Population	5.9 million	13.2 million	10.5 million	2.7 million fewer persons in 2040
Dependency Ratio	.68	.60	.45	DR 25% lower in 2040
LF Population Age 15-64	3.8 million	8.1 million	6.9 million	1.2 million fewer in the LF in 2040
New Entrants to LF	112,087	167,894	78,154	801,831 fewer LF entrants 2009-40

Table 6. Outputs from the Jordan RAPID Model, 2011				
Variable	Base Year 2009	Constant Fertility (2040)	Fertility Decline (2040)	Reduction with Fertility Decline 2009–2040
Primary School Students	1.4 million	2.7 million	1.6 million	1.3 mm fewer new students 2009-40
Medical Doctors Needed	15,372	33,000	26,000	7,000 fewer MDs needed in 2040
GOJ Health Expenditures	JD 1.1 billion	JD 4.1 billion	JD 3.3 billion	JD 9.3 billion total savings 2009-40
Arable Land per person	.42 Donum	.19 Donum	.24 Donum	.05 Donum per person more in 2040
Domestic Water/ person	31 CM /Yr	14.6 CM /Yr	18.3 CM/Yr	3.7 CM/Person/Yr less in 2040

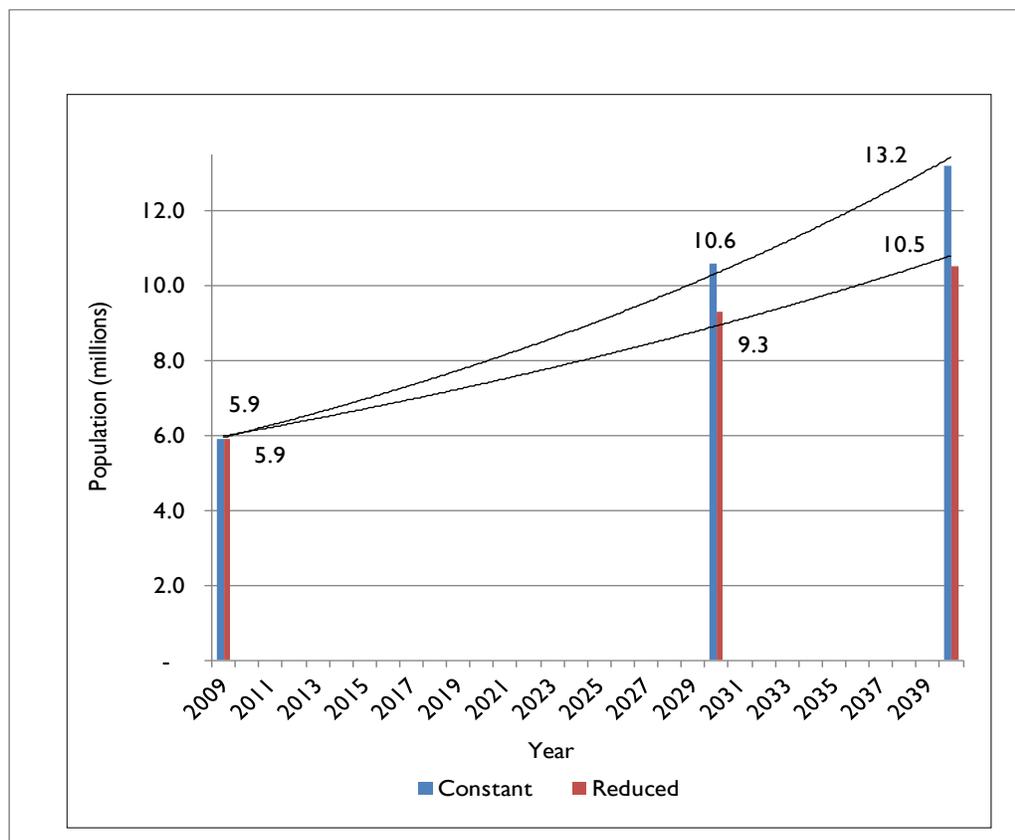
Source: Edward Abel, *The Futures Group International*, December 2011.

Births

In Scenario 2, there would be 164,116 fewer births in 2040. This is close to the number of births in 2009 (172,529) because Jordan's current young age structure guarantees that the number of births is projected to increase over the next 30 years regardless of whether fertility is reduced. However, with reduced fertility there would be about 2.6 million fewer total births between 2009 and 2040.

Population Size

With constant fertility, the total population would increase to 13.2 million in 2040 (see Figure 1). Indeed, Jordan's population would continue to grow even with reduced fertility, but at a slower rate. With reduced fertility, the population would be about 10.5 million by 2040. The net effect of a reduced fertility rate would be approximately 2.7 million fewer persons by 2040. The key point is that the population will continue to increase over the next 30 years due to the built-in momentum of a very young population (70% under age 30 in 2012) even with a successful and ambitious FP program.

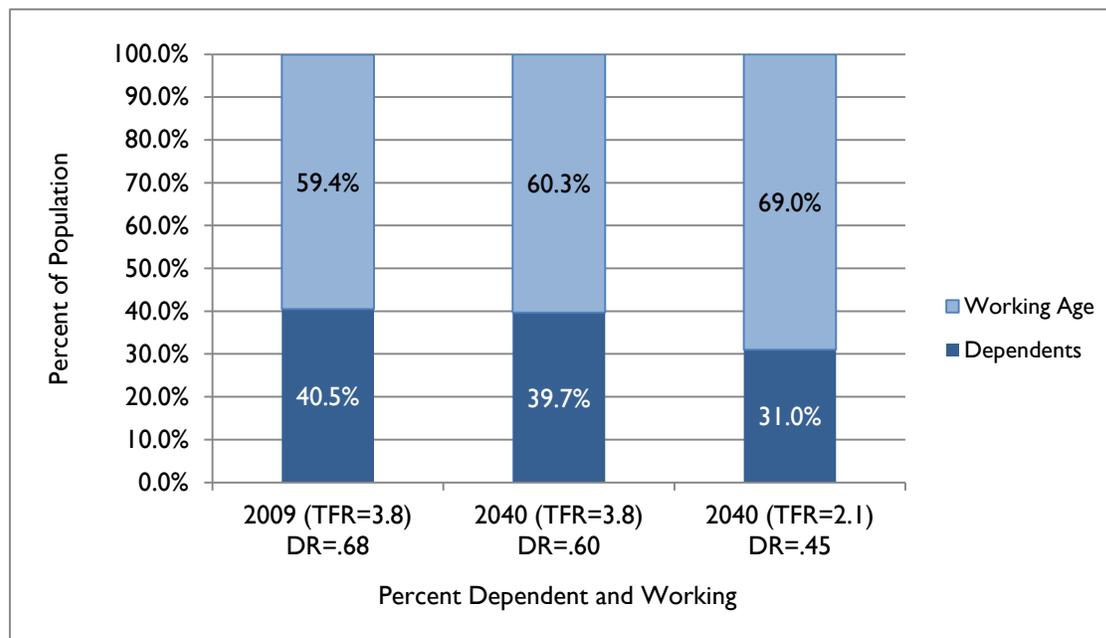


Dependency Ratio

The RAPID model projects that the dependency ratio (i.e., the ratio of those in nonproductive age groups [age 0–14 and 65+] to those in productive age groups [age 15–64]) is expected to decrease over time. With no fertility decline, the dependency ratio would fall slightly from 0.68 in 2009 to 0.60 in 2040 due to the large youth population. However, with fertility decline, the dependency ratio is expected to fall from 0.68 in 2009 to 0.45 in 2030 and remain at that level. These calculations assume that net immigration is zero and mortality remains low (see Table 7).

	2009		2030		2040	
	Constant	Reduced	Constant	Reduced	Constant	Reduced
0-14	37.3%	37.3%	35.8%	26.2%	34.1%	23.7%
15-64	59.4%	59.4%	60.1%	69.0%	60.3%	69.0%
65+	3.2%	3.2%	4.1%	4.8%	5.6%	7.3%
Total	99.9%	99.9%	100.0%	100.0%	100.0%	100.0%
Lt Age 30	67.8%	67.8%	60.5%	53.6%	60.0%	47.8%
Dependent	40.6%	40.6%	39.9%	31.0%	39.7%	31.0%
Labor Force	59.4%	59.4%	60.1%	69.0%	60.3%	69.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Dependency Ratio	0.68	0.68	0.66	0.45	0.60	0.45

Figure 2. Percentage of Jordanian Population in the Productive (Working) Age Groups and in the Dependent Age Groups in 2009 and in 2040 with Constant and Reduced Fertility



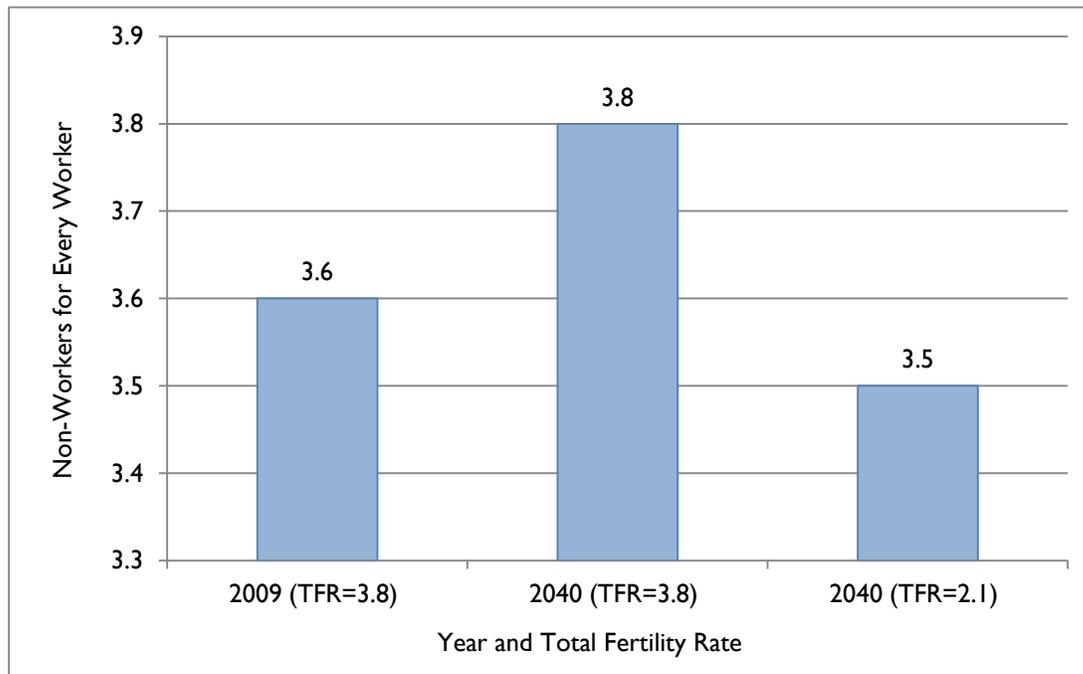
Labor Force Population

Population growth directly affects the future size of the labor force (aged 15–64) and consequently the number of jobs required by that population. Because those who will reach labor force age 15 years from now have already been born, it will take at least 15 years for any change in fertility to affect the population size of the labor force. This built-in momentum ensures that the population of labor force age will continue to grow for the foreseeable future, regardless of what happens to fertility. In 2009, there were approximately 3.8 million Jordanians of labor force age. With current fertility continued, this figure would increase to about 8.1 million by 2040. With reduced fertility, the population of labor force age would be about 6.9 million by 2040. Due to the built-in population momentum—first, there would be no change in the size of the population of labor force age over the next 15 years under any scenario; and second, the size of the population of labor force age will increase significantly in the future (see Table 8).

Ratio of Non-workers to Workers

However, the dependency ratio simply expresses the relationship among three age groups in the population; and a decrease in the dependency has no positive economic impact if the persons of productive ages (15-64) are unemployed. Therefore, it is also useful to consider the ratio of those who are not working to those who are working. In 2009, each working Jordanian was supporting another 3.6 persons (Figure 3).

Figure 3. Estimated Ratio of Non-Workers to Workers in 2009 and in 2040 with Constant and Reduced Fertility



If fertility remains constant at the 2009 level (TFR=3.8), it is estimated that by 2040 each working Jordanian will be supporting 3.8 persons. And even if the GOJ meets its fertility goals (TFR=2.1 in 2030), on average each working Jordanian will still be supporting another 3.5 persons. And this optimistic estimate for 2040 assumes that enough jobs will have been created between 2009 and 2040 to maintain the low activity rates and employment rates in the working age (15–64) population that existed in 2009 (see Table 8 and Figure 3).

Table 8. Estimates of the Ratio of the Not Working to Those Working in 2009 and in 2040 with Constant and Reduced Fertility

Population	Total	Male	Female
2009			
Total Population	5,900,000	2,950,000	2,950,000
Age 15–64	3,800,000	1,900,000	1,900,000
Activity Rate		0.624	0.149
Active	1,468,700	1,185,600	283,100
Unemployment Rate		10.7%	18.3%
Unemployed	178,667	126,859	51,807
Working	1,290,034	1,058,741	231,293
Not Working	4,609,967		
Not Working/Working	3.6		
2040—Constant Fertility			
Total Population	13,200,000	6,600,000	6,600,000
Age 15–64	8,100,000	4,050,000	4,050,000
Activity Rate		0.624	0.149
Active	3,130,650	2,527,200	603,450
Unemployment Rate		10.7%	18.3%
Unemployed	380,842	270,410	110,431
Working	2,749,808	2,256,790	493,019
Not Working	10,450,192		
Not Working/Working	3.8		
2040—Reduced Fertility			
Total Population	10,500,000	5,250,000	5,250,000
Age 15–64	6,900,000	3,450,000	3,450,000
Activity Rate		0.624	0.149
Active	2,666,850	2,152,800	514,050
Unemployment Rate		10.7%	18.3%
Unemployed	324,421	230,350	94,071
Working	2,342,429	1,922,450	419,979
Not Working	8,157,571		
Not Working/Working	3.5		

New Entrants to the Labor Force Population

Providing enough jobs for young people entering working age will be a difficult challenge in the future—and has many serious consequences in terms of family well-being, economic growth and political stability. This is particularly important in Jordan where high numbers of youth are currently unemployed. Creating enough jobs would be less problematic if fewer people enter the labor force age population. In 2009, the annual number of new labor force entrants increased by 112,078. With current fertility continued, this figure would rise to 167,894 in 2040. With reduced fertility, the annual number of new labor force entrants would fall to 78,154 in 2040. Between 2009 and 2040, as a direct result of reduced fertility, there would be 801,831 fewer new labor force entrants.

Primary School Students

Education is highly valued in Jordan because of limited natural resources (water, oil, land). It will be difficult to maintain the current level of education in the future because of the increasing number of children requiring education. In five to six years from now, Jordan will begin to feel the impact of reduced fertility on the number of children of school age. Assuming that the current primary school enrolment rate remains constant, with current fertility, the number of primary students will grow from 1.4 million in 2009 to 2.7 million by 2040. With reduced fertility however, there will be only 1.6 million primary students in 2040 or about 1.3 million fewer students enrolled in the primary education system.

Savings in Primary Education with Fertility Decline (JD 4.1 billion)

As the number of students increases, so will the required number of schools, classrooms, teachers, books and supplies. These items, in turn, will affect the funds required by the primary education sector. In 2007, it was estimated that the annual recurrent expenditure per student was JD 340. Assuming that this level of expenditure per student remains constant, the amount required to fund primary education will grow significantly in the future. Between 2009 and 2040, it would cost approximately JD 21.8 billion in recurrent expenditures for primary education with current fertility continued. Even with reduced fertility, the cost of primary education would be expensive—requiring about JD 17.7 billion over the 2009–2040 period. The cumulative savings resulting from reduced fertility, about JD 4.1 billion, however, would be significant and could be used to improve the quality of primary education.

Medical Doctors Needed

As noted earlier, Jordan has one of the lowest crude death rates in the world. This is a direct result of the high quality of health services available throughout the country. One of Jordan's highest priorities is to continue providing high quality health services for its people. Future population growth will directly affect Jordan's ability to achieve this goal; it will affect the number of medical professionals needed to provide quality health services; the number and type of medical facilities where these services will be provided; and the financial resources required to support the health system.

An example lies in the number of physicians that will be required due to future population growth. In 2009, there were about 15,372 physicians in Jordan—or about 25 physicians for every 10,000 people. If this doctor per person ratio were to continue in the future with current fertility, the number of physicians required would increase to almost 33,000 by 2040. By contrast, with reduced fertility, the number of physicians would need increase to about 26,000 by 2040—7,000 fewer than needed if current fertility rates continue.

Annual GOJ Health Expenditures

Expenditures required to finance the health system would also be impacted by future population growth. Recurrent expenditures on health totaled about JD 807 million in 2007, meaning that approximately JD 137 was spent for each person on health. The goal of the GOJ's National Health Strategy is to increase the amount spent on health to JD 245 per person by 2012 and JD 315 by 2017. With current fertility continued, annual recurrent health expenditures would increase from JD 1.1 billion in 2009 to JD 4.2 billion by 2040. This represents a nearly five-fold increase in the annual health budget. With reduced fertility, annual recurrent expenditures for health would still increase significantly—rising to about JD 3.3 billion by 2040. While this increase would be large, the annual amount spent on health in 2040 would be 900 million less with reduced fertility—about the total amount spent on health today. The costs to achieve the strategy's goals will increase substantially in the future, but with lower population growth, the amount will be far less. Over the 2009–2040 period, about JD 9.3 billion would be saved as a result of reduced fertility.

Arable Land

Future population growth will also have an impact on the ability of Jordan to feed its growing population. As the population increases, so will the requirements for food and the land needed for agriculture. An example can be found in the impact of population growth on the amount of arable land per person. In 2009, the total cultivated area in Jordan was approximately 2.5 million *donums*,⁵⁷ meaning that food grown on each 10 *donums* supported about 25 people. As the population grows and the amount of cultivated area remains constant, pressure on the arable land to support the population will increase. With current fertility continued, those same 10 *donums* that supported 25 people in 2009 will have to support 42 people in 2030. With reduced fertility, the pressure on the land will still increase substantially, but those 10 *donums* will only have to support 37 people. By 2040, the difference will be even more noticeable—with current fertility continued, those 10 *donums* will have to support 52 people, more than twice the number of people supported today. With reduced fertility, those 10 *donums* will only have to support 42 people. As we can see from the chart, the pressure on cultivable land will increase substantially in the future in any case. However, with reduced fertility, there will be about 26% more land available to support each person in Jordan in 2040.

Improving crop yields and bringing more area into cultivation would help alleviate some of the pressure caused by population growth. Unfortunately, given the topography and limits of yield increases, it is doubtful that Jordan will have the ability to produce the amount of food necessary to keep pace with future population growth. This means that more food, such as wheat, will need to be imported and hard currency will be needed to finance these imports. With reduced fertility, Jordan's ability to feed its population will be comparatively better, and the amount of food needed to be imported will be less.

Water

Water is one of Jordan's most precious and scarce natural resources. It is necessary for food production, household consumption, tourism and industrial uses. As a result of increased demand, caused in large part by population growth, the water available per person has declined significantly over the past 50 years. According to a MENA World Bank study, the total per capita level of water consumption fell from 529 cubic meter (CM) per year in 1960 to 175 CM

⁵⁷ One donum = 1,000 square meters = 10,764 square feet = 0.25 acres.

by 1997, and 140 CM by 2008—far below the water poverty line and making Jordan the fourth most water-deprived country in the world. The problem is compounded by the fact that Jordan's internal renewable water supply is insufficient to meet demand and currently over-pumping non-renewable groundwater. If the current level of domestic water production remained constant in the future at 194 million CM per year, the amount of water available per person would decline in the future as a result of population growth. With high fertility, the amount of domestic water available per person would decline from 31 CM per year to 18.3 CM in 2030 and 14.6 CM by 2040. With low fertility, the amount of domestic water available per person would still decline to about 20.8 CM in 2030 and 18.3 CM by 2040. However, given Jordan's available water supplies and increasing demand, water will continue to be a critical issue in the future under any scenario of population growth. With lower fertility, however, the situation will be less severe than with continued high fertility. In 2030, 14% more water would be available per person with low fertility than with high fertility continued, but would still be 35% less than the poverty line.

As we have seen from the 2011 RAPID model, the ability of Jordan to achieve its national development goals will be strongly affected by future population growth. H.M. King Abdullah recognized this reality in a speech on July 20, 2004:

Despite what has been achieved in the past years in terms of increased economic growth averages, citizens did not feel such an increase on their standards of living. The reason for this could perhaps be the result of an alarming increase in the population growth rate, which obliterates any positive effect of average economic growth. A national campaign is needed to enhance family planning, regulate the increase in the population, in a manner that doesn't contradict with our religious beliefs.”

VII. THE IMPACT OF REDUCED FERTILITY AT THE HOUSEHOLD (MICRO) LEVEL

Although a household might be better off financially with fewer children and the same level of income—and parents might be able to “increase the quality of their children” in an economic sense by investing more time in them and provide more advantages to them—the costs and benefits of children are not all monetary. Because there are limited options for female employment, there is little financial impact or opportunity cost to the household when a woman does not seek to work for income outside the home. Further, the value of children and psychological benefit of a large family can be considered to be a form of “income.” Low monetary family incomes have been mitigated by GOJ subsidies and the safety net provided by extended family. More importantly, women must pay a high cost for working outside the home—there is a low social value for women’s employment and their primary status is based on their roles as wives and mothers. For these reasons, when we consider the costs and benefits of fertility at the household level in the broadest terms, most Jordanian families would consider themselves to be worse off if their fertility fell below their ideal number of children. This desire for a large family is reinforced by cultural, religious and community values, which are expressed in an ideal family size of four children that has not changed since 1990. However, in the future, we can anticipate that the cost of living, including the cost of children, will have an impact on the ideal number of children desired in Jordan.

VIII. CONCLUSION

Jordan's fertility transition has plateaued in a range of statistical uncertainty between a TFR of 3.5 and 4.0 for the past 10 years. The history of population and development and the history of the worldwide fertility transition since the 19th century predict that the long-term drop in the TFR that started in Jordan in 1976 when TFR was 7.4 will continue.

However, without leadership from the highest levels, the fertility transition in Jordan is not likely to reach replacement level of TFR 2.1 in the short term. His Majesty King Abdullah II is dealing with political reform; pressures from conservative religious Jordanians; dissatisfaction from unemployment and the rising costs of living that led, in part, to the "Arab Spring" throughout the region; a sense among some Jordanians (many of whom are of Palestinian origin) that population growth is positive because it may change the political dynamic in the region vis-à-vis Palestine and Israel; tribal and ethnic pressures within Jordan; and an undercurrent that FP is an American issue that does not favor the Arab cause. In this political and social context, it is unlikely that the His Majesty the King will strongly and publically support FP and reducing family size. However, his strong leadership will be needed to incorporate population issues into the center of planning for development and security. This can be accomplished without directly referring to the controversial issues of FP and fertility control. For example, His Majesty might mandate that all ministries in the government effectively incorporate population change into their program and budget planning in both the short- and long-terms. The Higher Population Council could also be empowered to expand its mission beyond FP and the reduction of the TFR to serve as a policy and resource center for population and development in Jordan.

Finally, King Abdullah II could provide direction to the MOH to address the issues of unmet need for FP; missed opportunities for FP; the need for expanded access to a full range of contraception, including modern long-term methods; and the reasons for discontinuation. If these issues were vigorously and effectively addressed within a comprehensive and integrated national FP program, the Health Policy Project has estimated that the fertility in Jordan could be reduced from the current rate of 3.8 to 2.6. The final stage of fertility reduction from a TFR of 2.6 to replacement levels of 2.1 will depend on changes in society, economic conditions and families' demand for children. This final step to replacement fertility will take time and perhaps another generation. But the fertility transition that began in Jordan 40 years ago is expected to continue, if slowly, and it will both respond to, and will also contribute to, national development.

For more information, please visit
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GH Tech Bridge Project
1725 Eye Street NW, Suite 300
Washington, DC 20006
Phone: (202) 349-3900
Fax: (202) 349-3915
www.ghtechproject.com