

INVESTIGATING ELEMENTS OF A POPULATION, POVERTY, AND REPRODUCTIVE HEALTH RESEARCH AGENDA

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
I. BACKGROUND	4
II. STATE OF RESEARCH	4
III. HIGHLIGHTS OF RESEARCH RESULTS	5
Macro-Level Studies/Analyses.....	5
Micro-Level Studies/Analyses.....	8
IV. ON BALANCE: WHERE EVIDENCE ON THE POPPOV RESEARCH AGENDA STANDS	13
V. CONCLUSION	14
REFERENCES	14
TABLES	
Table 1. PopPov Research Outputs From January 2006 to September 2012	17
Table 2. Timeline for PopPov Research Activities 2005-2012	18
Table 3a. Research Outputs Address Empirical Challenges Identified in PopPov Research Agenda	19
Table 3b. Research Outputs Address Thematic Elements of PopPov Research Agenda.....	20
Table 4. Results From Micro-Level Studies Assessing Health Programs/Interventions	21
APPENDICES (online only)	
Appendix A: Overview of Projects	
Appendix B: Brief Description of Projects	
Appendix C: List of References (Project Outputs)	

EXECUTIVE SUMMARY

As part of the William and Flora Hewlett Foundation's initiative to enhance research and policy communication in population, reproductive health, and economic development, the foundation has partnered with institutions in the United States, the United Kingdom, Norway, the Netherlands, France, and Africa to strengthen evidence on how population and reproductive health affect economic outcomes in low- and middle-income countries. Under this population and poverty (PopPov) initiative, Hewlett partners—the Population Reference Bureau (PRB), the Research Council of Norway (RCN), WOTRO Science for Global Development, the Economic and Social Research Council (ESRC), l'Institut de recherche pour le développement (IRD), l'Agence française de développement (AFD), Institute for International Education (IIE), and the World Bank—have awarded research funding to more than 46 principal investigators and 49 Ph.D. candidates as of October 2012.

The Hewlett-supported program of research activities has addressed elements of the research agenda outlined by an expert working group convened by the Center for Global Development. The PopPov research agenda prioritizes policy-relevant research questions that address the effect of reproductive health on the economic growth of countries and on the well-being of individuals and households. Researchers have been encouraged to use macro-level analyses to examine the pathways through which country-level shifts in demographic trends affect economic development, including the direct effect of population growth, trends in components of growth (fertility and mortality), and how this growth affects intermediate factors such as women's labor force participation and asset accumulation. Regarding outcomes for individuals and households, the PopPov research agenda encourages micro-level analyses and places considerable emphasis on improved reproductive health as a potential pathway to poverty reduction.

This report mainly highlights research results that directly bear on the thematic issues and policy questions that are the focus of the PopPov efforts: the relationship between population growth, reproductive health, and economic outcomes. The body of the report organizes results from many of the studies according to substantive topic areas to facilitate a broad overview of the Hewlett-supported research under the PopPov initiative; the Appendices (online at www.poppov.org) include a bibliographic list of published studies, project descriptions, and an overview of projects with their corresponding contributions to the working group agenda.

MACRO-LEVEL STUDIES

The research agenda suggested that macroeconomic policy research address projected trends in population processes (fertility, mortality, migration) and their related consequences

for economic growth, income distribution, and the incidence of poverty. Macro-level studies supported through PopPov partnerships have addressed the questions of how the shifts in mortality and fertility trends (and consequent population growth) associated with the demographic transition affect economic growth as measured by national income. They have also investigated how policy change affects economic growth and contraceptive use. Research findings suggest that family planning programs are effective, modern contraceptives are cost-effective (at least in one setting), and legalization of abortion reduces births and thereby increases women's labor force participation during reproductive years. The evidence these studies have generated lends support to the provision of family planning programs in high-fertility countries as a means to facilitate economic development and individual well-being.

When income per capita alone is the outcome measure of economic growth, the economic gains from health improvements tend to be small in comparison to the health gains, and these economic gains accrue slowly. However, health improvements contribute to increased well-being, and when monetized for sub-Saharan Africa, it is possible for a country to achieve growth even when income stays the same.

MICRO-LEVEL STUDIES

The working group report that established the PopPov research agenda highlighted the need for exploration of behaviors at the household level in order to: (a) ascertain how specific types of reproductive health programs can affect the health of women and children; (b) better understand how investments in reproductive health can affect economic conditions at the household level; and (c) identify whether and under what conditions reproductive health programs can reduce poverty. Studies completed to date have primarily investigated subsets of these questions. Most have looked at the effect of fertility on labor supply; the return to parental investment in children's health and education; and the effects of health interventions on sexual behavior, decisions regarding contraception, and maternal health.

Completed micro-level research in the PopPov initiative examines pathways between family planning, reproductive health, and health outcomes for women and children. The results add to the evidence base on issues related to the importance of family planning and access to reproductive health services for human capital outcomes, including both mother and children's short-term and long-term health and education. In conjunction with the macro-level findings on the long-term effects of health on GDP as well as implications for social welfare, the current micro-level research underscores the benefits of improvements in access to family planning and reproductive health services. The research also

identifies some promising activities for improving health and educational outcomes for both women and children: providing confidential reproductive health services to women, delivery of midwife services in rural areas, and cash incentives or income supplements for school attendance/performance and for avoiding risky sexual behaviors.

Many of the micro-level studies, both those completed and in progress, use data gathered in a few test sites within a country, one region within a country, or the historical experience of a program within one country. While evidence of causal relationships may not be conclusively generalizable, it at least provides an empirical foundation for considering new program designs or changes to existing programs. However, to extend such results beyond the local contexts of the individual studies and beyond each specific program, it will be important to examine these findings in conjunction with the broader evidence available either for that country or for the types of programs of interest.

LOOKING FORWARD

The working group report envisioned a research agenda that would provide new evidence applicable to budgetary and programmatic decisions, and PopPov researchers have taken significant steps in advancing elements of the research agenda outlined by the working group, despite data and empirical challenges. PopPov researchers have collected and generated new datasets that include reproductive health and demographic variables; identified new instruments in macroeconomic analysis to allow for causal inference; and evaluated a range of antipoverty and reproductive health programs and policies that affect the health, wealth, and education of women and children. Their findings have substantiated already existing evidence and provided new evidence on programs and policies linking economics and reproductive health-related issues.

I. Background

As part of the William and Flora Hewlett Foundation's initiative to enhance research and policy communication in population, reproductive health, and economic development, the foundation has partnered with institutions in the United States, the United Kingdom, Norway, the Netherlands, France, and Africa to strengthen evidence on how population and reproductive health affect economic outcomes in low- and middle-income countries. The Hewlett Foundation and its partners have supported research to improve the evidence base and to inform medium-term policy issues. The research has been guided by issues represented in the following questions and outlined in an agenda developed by the Center for Global Development (CGD) expert working group:¹

- 1) Given the projected trends in fertility and mortality changes, what are the implications for economic growth and income distribution and the incidence of poverty?
- 2) How does investment in reproductive health affect economic conditions at the household level, including the productivity, labor force participation, and savings behavior of women, children, and households?
- 3) How do different types of investments in reproductive health affect the health of women and children?
- 4) How does the type and organization of services affect their effectiveness, including ability to reach poor and vulnerable populations?

The experts who developed this research agenda considered the above questions to be particularly relevant to sub-Saharan Africa, a priority region because of its unique demographic patterns and deep poverty—and also a region where data are lacking.

Under this initiative, Hewlett partners—the Population Reference Bureau (PRB), the Research Council of Norway (RCN), WOTRO Science for Global Development, the Economic and Social Research Council (ESRC), l'Institut de recherche pour le développement (IRD), l'Agence française de développement (AFD), Institute for International Education (IIE), and the World Bank—have awarded research funding to more than 46 principal investigators and to 49 Ph.D. candidates as of October 2012. The research produced by these grants expands the existing body of knowledge at both macro- and micro-levels of analysis. Grantees have generated much-needed new data sets that include reproductive health and demographic variables. Researchers have also made innovative use of various statistical techniques and experimental methods, including randomized controlled trials. More than 100 working papers, articles, and book chapters have been published from research supported through these grants (see Table 1). In addition, the Hewlett Foundation funds a Secretariat and an annual research meeting to support intellectual exchange among the researchers, partnering institutions, and interested policy actors and advocates—the Population and Poverty Network (PopPov).

This report draws on selected findings from PopPov research results most pertinent to the questions outlined above.² The body of research supported under the initiative does not represent the full compendium of evidence on reproductive health and economic growth, but the work contributes to the study of reproductive health and its relationship to poverty and economic development in low- and middle-income countries.

The remainder of the report is organized as follows:

- Section II outlines the development of the research partnerships and grants supported by the Hewlett Foundation and its partners. It also provides a snapshot of the elements of the research agenda delineated by the CDG expert working group in its 2005 report and identifies key studies that addressed particular elements of the agenda.
- Section III highlights research results (to date) relevant to the major areas of analysis—macro-level analyses and micro-level or behavioral analyses.
- Section IV looks at the findings to date and describes work in progress on ongoing grants as well as research goals of grants funded at the end of 2012.

II. State of Research

The Hewlett-supported program of research activities (see timeline in Table 2) has addressed elements of the research agenda outlined by experts in the CGD working group,³ with each partner institution emphasizing slightly different aspects of the agenda. The World Bank and PRB funded-projects emphasized economic analyses at the macro- and micro-levels, with several projects implementing experimental designs, including randomized controlled trials. The IRD-funded projects focused exclusively on researching demographic issues in Africa, involving a cadre of West African partners in the PopPov endeavor. The projects funded by the ESRC, NWO/WOTRO, and RCN included strong components of capacity building, with African master's students, Ph.D. candidates, and postdoctoral trainees playing significant roles in these research programs. Thematically, the studies completed as part of projects funded by the Hewlett Foundation and its partners explore a wide range of issues related to the questions and paradigm set forth in the CGD working group research agenda. In addition, many studies tackle empirical challenges identified in the same working paper. Appendix A (online only) provides an overview of all grants, identifying their contribution to key elements of the research agenda while Tables 3a and 3b list key research publications from studies that addressed empirical challenges and themes identified as elements of the PopPov research agenda.

The main themes of the PopPov research agenda have been the effects of reproductive health on the economic growth of countries and on the well-being of individuals and households. Researchers have been encouraged to look at the

pathways through which country-level shifts in demographic trends affect economic development, including the direct effect of population growth, trends in components of growth (fertility and mortality), and how this growth affects intermediate factors such as women's labor force participation and asset accumulation. Regarding outcomes for individuals and households, the PopPov research agenda placed considerable emphasis on improved reproductive health as a potential pathway to poverty reduction. Researchers have investigated a range of outcomes and influencing factors. The outcomes examined extend across the life course, from birth weight to educational attainment and even mortality. The influencing factors assessed are equally as varied and wide-ranging. They include, among many others, in utero environmental exposures⁴ and age of the mother at first birth.⁵ Researchers have also addressed these issues by evaluating the effect of family planning programs, conditional cash transfer programs, and information interventions.⁶ Some analyses offer direct assessment of family planning or reproductive health programs,⁷ while others provide relevant evidence from other types of services.⁸

In addition to studies that directly investigate the thematic questions and policy issues embodied in the PopPov research agenda, other research provides insight into methods for confronting the empirical challenges associated with efforts to prove causation. PopPov researchers have taken advantage of natural experiments presented by geographic or time-phased rollout of programs,⁹ unanticipated income shocks precipitated by climate variability,¹⁰ and contraceptive supply interruptions resulting from unanticipated economic crises or policy changes.¹¹ Some researchers have also tackled issues of causation in the investigation of macroeconomic outcomes by using results of micro-level analyses as input for macro-level models.¹²

The next section of this report mainly highlights research results that directly bear on the thematic issues and policy questions that are the focus of the PopPov efforts: the relationship between population growth, reproductive health, and economic outcomes. The section also draws on studies that are potentially informative for the design of reproductive health and family planning programs as well as for the formulation of population policies and program evaluations. In general, neither the section nor the report discuss purely theoretical/conceptual results, nor papers that make purely methodological contributions not closely tied to the PopPov research agenda. For example, a few PopPov studies make theoretical and methodological contributions while investigating topics such as the diffusion of agricultural technology (McNiven and Gilligan, 2012) and the effect of neighborhood residence on fertility (Weeks et al., 2010). McNiven and Gilligan's study used a unique sampling methodology for examining networks and diffusion in Uganda, while Weeks and colleagues used geospatial analysis, a mode of analysis rarely used in the developing-country context, to assess the influence of neighborhoods on fertility.¹³ These studies are not

highlighted in this report, but some are identified in Table 3a. All known research publications resulting from work supported under grants provided by the Hewlett Foundation and its partners to date are included in the bibliography found at the end of this report. A searchable bibliography is online at www.poppov.org.

III. HIGHLIGHTS OF RESEARCH RESULTS

This section organizes and discusses, by topical area, completed analyses based on research supported by Hewlett-funded partners in the PopPov network. The results discussed are based on conclusions drawn from researchers' analyses, many of which rely solely on data from test sites or one region in one country. The authors of this report have tried to indicate when studies cover a broader set of countries. In general, the specific results presented in the micro-level section cannot be generalized beyond the context in which the study was conducted. Summary statements provided below are meant to indicate the tendency of the findings discussed, not to provide definitive conclusions that would hold across countries.

MACRO-LEVEL STUDIES/ANALYSES

The research agenda set out by the CDG working group included a focus on population determinants of sustainable national economic growth. In keeping with this recommendation, PopPov researchers have analyzed the effects of demographic factors, including health improvements/challenges,¹⁴ fertility reduction,¹⁵ and population size¹⁶ on national income. They have also investigated related questions that help quantify the effects of population factors on economic growth. Researchers have asked: What is the extent to which the size or makeup of the labor force can substitute for natural resources and other fixed factors and what are the effects of changing age cohort sizes on wage rates and earnings?¹⁷ This subsection highlights findings from macro-level analyses that provide insight into implications of shifting trends in fertility and life expectancy for economic growth and into policies aimed at producing or sustaining economic growth.

Fertility, Mortality, and Population Trends

Two approaches have dominated analyses of population changes associated with the demographic transition—simulations and comparative studies. Simulations have considered the effects of plausible pathways through which components of the demographic transition (declining mortality rates/increasing life expectancy, reductions in fertility rates, and population growth) might influence economic growth.¹⁸ Comparative studies have assessed countries' past experiences with the demographic transition.¹⁹ The results of these studies indicate that: a) the direct effect of increased life expectancy is not powerful enough to drive rapid increases in national income; and b) the effect of population growth (produced

by changes in mortality and fertility) depends on the policy environment, the availability of technological innovation that addresses population pressure on land and other natural resources, and the social and cultural context.

What happens when people become healthier and live longer? Does the economy grow? Because people with higher incomes can afford to eat better, to buy more medicine, and to see health care professionals more often, it is difficult to separate the extent to which health improves wealth from the extent to which wealth improves health. In one study, Ashraf, Lester, and Weil look at longer life expectancy and the eradication of malaria and tuberculosis as two measures of improved health status in developing countries.²⁰ These researchers find that improving a nation's physical health does not contribute much to economic growth given the extent of health improvement and given that the growth associated with health improvements occurs very slowly. The study also examines how an improvement in health affects worker productivity and other factors that might indirectly affect economic growth, such as schooling and the size and age structure of a population. The analysis shows that an increase in life expectancy at birth (a proxy for health) from ages 40 to 60 can raise GDP per capita by roughly 15 percent in the long run.²¹ Eradicating malaria or tuberculosis in a "typical" sub-Saharan African country would raise GDP by only 2 percent in the long run.²² The authors point out that while health improvements may well raise worker productivity, having a healthier population may contribute to rapid population growth, which may have a negative economic effect in the long run.

Complementary policies and investments could mitigate the effects of rapid population growth. For instance, foreign investment may help reduce shrinking GDP per capita that results from population pressure. Similarly, planning for extra teachers and extra schools may help in coping with a likely large increase in the number of school-age children, thus reducing the adverse effects of overcrowded classrooms on human capital accumulation. Also, family planning information programs and increased availability of modern contraceptive methods could help slow population growth. Such policies and programs could greatly accelerate the translation of health gains into improvements in standards of living.

Weil examines the effect of improved health specifically on Africa, finding that, at best, there is weak support for the claim that "the disease burden in Africa significantly lowers GDP or that improving health would provide a big impetus to economic growth."²³ But there can be substantial human welfare benefits from better health: longer life, not seeing loved ones dying, and averting the suffering of disease. The economic benefits of these improvements are roughly the same value as the growth of conventional GDP over the last several decades. When one considers both health and income improvement as components of economic output, it is possible for a country to achieve respectable "growth,"

even when income does not change. Weil suggests that policy decisions regarding the allocation of scarce resources should be based on the goal of maximizing the combined increases in health and income.

Simulating the effect of AIDS on economic change, Raul Santaeulalia-Llopis contributes to the study of the effects of disease on development.²⁴ Santaeulalia-Llopis calibrated a development model to a country in a similar stage of development as the sub-Saharan African (SSA) countries with fertility and mortality not affected by the AIDS epidemic. He then introduced into the model an AIDS shock that changes fertility and mortality rates as it does in SSA countries with mature AIDS epidemics. Results of this simulation indicate that the AIDS epidemic reduces per capita income by as much as 12 percent nationally at the peak of the epidemic.²⁵ The epidemic also slows the transition from agriculture to industry by about one century for the most highly infected countries. An important next step in this research would be to evaluate whether and how much AIDS-related policies accelerate the process of industrialization and increase the income per capita of SSA countries. However, this would require richer models of family structure to capture variations in how AIDS affects individuals and their families and in how the effects of policies vary across households.

In the context of a high-fertility developing country, how much higher would income per capita be if the fertility rate were to fall? Ashraf, Weil, and Wilde use simulation models to examine the effect of a change in fertility on output per capita, allowing declining fertility to impact schooling, the size and age structure of the population, capital accumulation, parental time spent on childrearing, and use of natural resources.²⁶ They determined that reducing fertility would raise output per capita by 5.6 percent in 20 years, and by 11.9 percent in 50 years.

To what extent might growth in labor supply (such as that promised by a demographic dividend) substitute for a lack of productive natural resources in promoting economic growth? Larger populations cause resources per capita to shrink. If labor cannot be substituted for resources, then additional labor has little impact on production, resulting in lower per capita income as fixed factors, such as land and natural resources, shrink. The extent to which labor might substitute for natural resources in increasing national income has implications for the negative effects of population growth on development. Researcher Joshua Wilde finds that substituting labor for fixed factors occurs less frequently than most economic models assume. At the same time, however, his findings support the theory that population pressure can result in innovation; for example, when land becomes scarcer, farmers may develop more-efficient cultivation methods.²⁷

Ernesto Amaral looks at how changing age and education structure of a population combined with human capital investments might affect wage rates and earnings.²⁸ Rapidly declining fertility and increased longevity has rapidly altered the age

structure of the labor force in many developing countries. Such changes in the relative supply of workers by age group and education can profoundly affect labor costs. Amaral's analysis of changes in the Brazilian labor market show that larger cohorts experienced depressed wage rates, particularly among more-educated groups. In Brazil, shifts in the age distribution have been accompanied by dramatic increases in educational attainment. Amaral finds that in the 21st century, the decreasing size of the least skilled labor force is barely raising its remaining members' wages, but the increasing size of age cohorts has a more-depressing effect on wages for more-educated groups.

Bloom, Canning, Finlay, Fink, and other co-authors look at the demographic dividend and fertility in Africa, Asia (in particular China and India), Europe, and low- and middle-income countries in a series of papers.²⁹ Their analyses for Africa suggest that only countries with high institutional quality³⁰ can achieve a demographic dividend.³¹ In an analysis of economic growth in China and India since 1980, Bloom and his co-authors find that purely domestic factors explain these countries' growth rates better than a combination of domestic and worldwide factors. The primary drivers of growth were a rise in life expectancy, a rise in trade or openness of the economy, and an increasing share of working-age members among the total population.

Policy Effects on Economic Growth

Few completed macro-level studies directly address the effects of specific policies on economic growth. Overall, findings from several studies outlined in this section suggest that policies supporting access to modern methods of contraception will reduce fertility and should thereby increase women's labor force participation and investment in human capital, both factors in economic development.

With respect to family planning programs and policies, some studies have looked at the legalization of abortion (albeit as a proxy for fertility), subsidizing the cost of contraceptives, and the effectiveness of family planning programs. A series of related studies by Joseph Babigumira³² considers the costs associated with induced abortions in Uganda and estimates the cost-effectiveness of achieving universal access to modern contraceptives. In the Ugandan policy and social context where abortion is illegal but highly sought after in secret and unsafe conditions, the cost of induced abortions is substantial. Under a hypothetical new contraceptive program providing universal access to modern contraceptive methods, both patients and the government would realize cost savings. Bloom et al. (2009) use abortion legalization as an instrumental variable to achieve statistical identification in one set of models. They find that legalization of abortion (a proxy for reduction in fertility) is associated with increases in women's labor force participation during reproductive ages.³³ McKelvey et al. (2012) look at whether increasing the cost of contraceptives affects their use, finding that in Indonesia's mature contraceptive market, there is little effect on the use

of modern contraceptives but that there is some shifting to lower-cost methods.³⁴

Whether family planning programs are effective and should be publicly funded is one of the questions examined in a review of literature by Das Gupta, Bongaarts, and Cleland (2010).³⁵ They conclude that these programs are effective and might be particularly relevant to SSA where institutional constraints and high fertility hamper efforts to increase standards of living. In other PopPov research, Kakoko and his colleagues (2011) examine public and private health facilities in Tanzania and find that public facilities were more likely to offer modern contraceptives and to follow protocols consistent with standards for the delivery of family planning services.³⁶ They conclude that in Tanzania, there is a need for greater enforcement of care standards.

Social Context

Another factor in determining the impact of reduced fertility and/or population growth on economic growth is the social context. Social barriers to realizing the full national economic potential conferred by demographic shifts include the preference for sons in certain regions of the world and the legacy of conflicts (social disorganization) in other areas.

Filmer et al. (2009) studied modernization and son preference based on data covering 64 countries and found that even after the advent of low fertility and greater modernization, there is still a preference for sons.³⁷ Fertility behavior responds to the presence (or absence) of sons in many regions of the developing world. In Central Asia and South Asia, the response to the absence of sons is particularly large, and modernization as measured by rural-urban location, education, and wealth does not appear to reduce this response. In South Asia, more-educated women are more likely than less-educated women to continue having children if they have no sons. This differential response, by education, to the absence of sons has been increasing over time, perhaps because the hidden demand for sons is more noticeable in a low-fertility environment. One result of this differential fertility behavior is that girls tend to grow up with significantly more siblings than boys do, with potential implications if larger families allocate fewer material and emotional resources to each child. In this context, social policies that aim to limit fertility may have the unintended consequence of exposing the strong preference for sons.

Summary

Macro-level studies supported through PopPov partnerships have addressed the questions of how the shifts in mortality and fertility trends (and consequent population growth) associated with the demographic transition affect economic growth as measured by national income. When income per capita alone is the outcome measure, the gains appear to be weak relative to substantial health improvements. These gains also accrue over a long period of time. However, health

BOX 1

Qualitative Methods

Several PopPov research teams have used qualitative methods to uncover the complexities of individual and household behaviors not captured through quantitative analysis.

Two PopPov research teams focused primarily on qualitative methods to fill research gaps, exploring behaviors behind observed trends. Storeng et al. (2010) conducted repeated in-depth interviews with women who had survived severe obstetric complications in Burkina Faso. Using qualitative analysis methods, the authors found that women who had a severe obstetric event also experienced significant disruptions in their bodily integrity, household economy, social identity, and stability.¹ In another qualitative analysis, Jensen (2013) is using in-depth interviews and case studies to explore the reasons why fertility declines commenced and then discontinued in a rural, western community in Kenya. Preliminary results show that women's ability to prevent

pregnancy in this community is limited and aggravated by persistent poverty.²

In their research on child mobility in Senegal, Kielland and Gaye's (2010) use of qualitative methods enabled them to assess their interpretation of the results from quantitative analyses.³ By combining both qualitative and quantitative analytical methods, these researchers are able to measure their findings and to explain some of the complexities behind the data.

References

- ¹ Katerini Tagmatarchi Storeng et al. (2010). Beyond Body Counts: A Qualitative Study of Lives and Loss in Burkina Faso After 'Near-Miss' Obstetric Complications. *Social Science & Medicine*, 71, no. 10 (2010): 1749-56.
- ² An-Magritt Jensen. (2013). Female Autonomy and Fertility in the Context of Poverty: Case Studies Before and After the Fertility Decline in Rural Kenya.
- ³ Anne Kielland and Ibrahima Gaye. (2010). Child Mobility and Rural Vulnerability in Senegal.

improvements contribute to increased well-being, and when monetized for SSA, they are as large as the amount of growth from income. Researchers suggest that both the weak economic effects of health gains and the strains of associated population growth on fixed factors such as land and natural resources have implications for policymakers, lending support to provision of family planning programs and investment. Research findings suggest that family planning programs are effective, modern contraceptives are cost-effective (at least in one setting), and legalization of abortion reduces births and thereby increases women's labor force participation during reproductive years. This evidence provides support for government investments in family planning programs in high-fertility countries.

MICRO-LEVEL STUDIES/ANALYSES

As part of the research agenda, the CGD working group also proposed the exploration of behaviors at the household level, in particular investigation of the following:

- Effect of fertility regulation on women's labor supply and productivity.³⁸
- Effect of fertility regulation on savings behavior.
- Effect of changes in sexual behavior on school continuation rates, health, and job skills.
- Effect of lower fertility on parental investment in children's education.

Studies completed to date have primarily examined three sets of effects: fertility's influence on labor supply; parental investment's implication for children's health and education; and health intervention outcomes with respect to sexual behavior,

decisions regarding contraception, and maternal health. Several PopPov research teams have assessed the role of cash transfer programs in parents' investment in girls' health, in girls' educational outcomes, and in reducing risky sexual behaviors.³⁹ These cash transfer programs have shown promise in encouraging school attendance and reducing risky sexual behaviors. A number of the cash transfer studies and other PopPov research have used random assignment evaluation methods to provide high-quality evidence for policy decision-making.⁴⁰ While most of the random assignment studies do not directly assess the effect of changing sexual behaviors on school and labor market outcomes, they take a step toward such analysis by investigating how specific programs can change sexual behavior or school attendance.

Other PopPov-supported micro-level research investigates how reproductive health programs can improve economic conditions at the household level, addressing this question in several ways, including exploring the extent to which mother's health affects child health and educational outcomes. This research is relevant to the pro-poor growth research objectives of the PopPov Network because improving children's health and increasing educational attainment may result in benefits for individuals in later years and ultimately create benefits for countries. The sections below highlight substantive research findings that align with the PopPov research agenda for studying households and individuals.

Fertility Regulation and Children's Health and Development

PopPov researchers have investigated how the number of children in a family, number of siblings, and desired family

size affect the health and education of children within the family. Improvements in children's schooling outcomes as a result of decreased fertility have potential long-run benefits for households and economies by increasing labor force participation and productivity. In general, PopPov researchers have found a negative relationship between number of siblings and children's health and between number of siblings and educational outcomes.

Longwe and Smits (2012) used Demographic and Health Surveys (DHS) from 30 SSA countries to explore how reproductive health practices and fertility affect children's school attendance. These authors found that children living in larger families have a significantly lower probability of school attendance than children living in smaller families, and that children born shortly after their older siblings have significantly lower probability of school attendance than children who were not. They also found that the presence of a young child in the family has a significant effect on the probability of school attendance when relevant socioeconomic, demographic, and contextual factors have been accounted for.⁴¹

In other research, the same team investigated the effects of family planning services on educational participation of children in 25 SSA countries. Using path analysis to estimate the strength and direction of relationships, the research team identified an associational chain that linked increases in the acceptance of modern contraceptives to use of such contraceptives, and linked increased contraceptive use with decreased numbers of births. This decreased number of births was associated with increases in primary school attendance.⁴²

Baschieri et al. (2012) use retrospective data and propensity score matching⁴³ to assess the impact of unintended childbearing on children's growth in Malawi. They find that unwanted births are associated with older siblings being stunted. A stronger stunting effect is present for those children born less than two years apart.⁴⁴ These preliminary findings suggest that birth spacing influences human capital because it affects childhood growth and development, but in ongoing analyses, the authors have found little effect using prospective data.⁴⁵

In summary, PopPov research teams have found that unintended births and higher numbers of children in a family can lead to adverse effects on child health and education. These findings lend support to the hypothesis that greater control over childbearing and lower fertility within households/families provides a foundation for improved labor market and productivity outcomes.

PopPov researchers investigating children's health and economic outcomes have also tried to separate the effect of parental socioeconomic status from more proximate influences such as nutrition and mother's age at the time of childbirth. Findings show that teen childbearing contributes to negative health outcomes in early childhood in South Africa. Branson, Ardington, and Leibbrandt (2011) investigated the

effect of being born to a teen mother on child health outcomes in Cape Town, South Africa. These researchers were able to isolate the effects of teen pregnancy from the effects of socioeconomic conditions (such as poverty) associated with teen pregnancy by using propensity score matching techniques. Using longitudinal data from the Cape Area Panel Study (CAPS), the researchers found that children born to teen mothers are more likely to be underweight at birth, to be stunted, and are shorter for their age than children born to mothers who have similar pre-childbirth characteristics but gave birth after age 19. In addition, among coloreds⁴⁶ there is a much larger adverse effect of early childbearing: Children born to these teen mothers have approximately twice the disadvantage of those children born to African teens.⁴⁷

Maternal Health and Child Health and Development

Understanding the pathways leading to improved child health and education outcomes may provide information about how to improve the design of health and poverty reduction programs. Several PopPov researchers have investigated the effects of maternal obesity, prenatal and obstetric care, and mother's health while pregnant. This research links mother's health to her child's immediate and long-term health and human capital outcomes.

Cresswell et al. (2012) investigated the effect of pregnant mothers' health on child health outcomes, looking specifically at the role of maternal obesity in neonatal death.⁴⁸ Using DHS from 27 SSA countries, the research team found that maternal obesity was associated with increased odds of neonatal death after adjusting for confounding factors. They also found that maternal obesity was a significant risk factor for neonatal deaths during the first two days of life. The authors concluded that more-robust longitudinal studies are needed in order to establish a causal relationship between maternal obesity and neonatal deaths and, if these findings are confirmed to be causal, obese women should be strongly advised to deliver in a health facility that has the capacity to provide emergency obstetric and neonatal care. Alternatively, the authors suggest that it would be preferable to institute public health policies to discourage population-level increases in body mass index (BMI).

Taking a different approach to assessing the effect of pregnant mothers' health on child outcomes, Cas (2011) analyzed the Safe Motherhood Program, an intervention in Indonesia that seeks to increase access and uptake of maternal health care and safe delivery services. Cas exploited variation in the availability and timing of program rollout across communities and cohorts to assess the program's effect on child educational attainment and cognition. She found that children whose mothers had been exposed to the program experienced significant increases in years of education and cognitive test scores.⁴⁹

Nikolov (2012) is also investigating the role of prenatal maternal malnutrition on children's "intellectual capital" by assessing the impact on child schooling attainment. Prenatal

and early life outcomes can be influenced through several different biological and psychological channels, including the biological channel involving fetal deficiency of B6, B12, and folic acid, which can permanently limit cognitive abilities.⁵⁰ Nikolov's research built on an RCT implemented in Tanzania (2001-2003) that offered micronutrient supplements to pregnant women who were HIV negative. With half of the target sample complete, researchers have found some evidence of the impact of micronutrients on cognitive outcomes. Nikolov suggests that these links between fetal health, development of cognitive abilities, and economic outcomes imply that resources are not being optimally allocated across the life cycle, and that investments in fetal and maternal health are currently underfunded.

Using a different approach to explore the intergenerational effects of malnutrition, Fung and Ha (2009) are taking advantage of the 1959-1961 China famine, an exogenous shock that affected everyone in the country independently of income. The intensity of the famine also varied in different regions of the country due to variation in exposure to bad weather, provincial response, and population density. Preliminary findings reveal that those exposed to the famine experienced stunting (low height for age), had a higher BMI, completed fewer years of schooling, and were less likely to have completed primary school. Further, children born to those exposed to famine experienced higher stunting and wasting (low weight for height).⁵¹

Women's Decisionmaking Power Within the Household

In SSA, the overall rate of unmet need⁵² for contraception was estimated to be 27 percent in 2006, suggesting that women and couples have difficulties accessing contraception.⁵³ Even in locales where contraception is readily available, high rates of unwanted births are reported. High unmet need while contraception is available suggests that there are other dynamics at play. Some researchers have postulated that high unmet need under these circumstances occurs because husbands and their wives have different fertility preferences.⁵⁴ Several PopPov research teams have examined the role of women's decisionmaking power in the household, and their findings suggest that family planning and antipoverty programs have the potential to enhance women's decisionmaking power in the household, which may reduce unwanted pregnancies and improve child health outcomes.

Ashraf, Field, and Lee (2013) explored how the husband's presence in the fertility clinic affected uptake of contraception among women. The research team implemented a field experiment in Zambia, a country that experiences high excess fertility,⁵⁵ despite availability of contraceptives through both public and private providers. The experiment provided a voucher that guaranteed short wait time and free access to concealable forms of contraception,⁵⁶ with the treatment arms being split into two groups: one where women received the voucher in private, and another where the couple received the voucher together. Wives receiving vouchers without having

their husbands present redeemed their vouchers and used concealable contraceptives at a higher rate than the couples who received the voucher together.

Those women provided access to contraception without their husband being present reported lower subjective well-being (felt less happy) than other women in the experiment. This suggests that there are psychological and social costs to making contraceptives more concealable. While these less happy women did not report more marital dissolutions or domestic violence than other women in the study, this finding suggests a longer-term psychosocial cost to concealable contraceptives that may be addressed by involving husbands.

The finding that male involvement potentially reduces use of contraceptives among couples with conflicting fertility preferences helps explain why results from previous studies on male involvement in family planning have been mixed and why concealable contraceptives, such as injectables, have proven to be so popular in cultural contexts where men dominate family planning decisions. In reality, giving women access to injectables privately improves her set of choices but also may have detrimental consequences for her marriage. For this reason, it is important for practitioners to ask whether policies that reduce further investments in the marital relationship are the right path to take. Based on these results, the researchers suggest that some women would be better-off by having more opportunities to make contraception decisions in private, and by gaining access to concealable, long-term contraceptive methods.

Rubalcava, Teruel, and Thomas (2009) investigated women's decisionmaking power in a couple-headed household. The study investigated the effect of the PROGRESA program on women's household decisionmaking power, taking advantage of the program's design and phased rollout to isolate the effect of putting a greater proportion of household income into women's hands. PROGRESA is an antipoverty, conditional cash transfer program initially implemented by the Mexican government in 1997. The study exploited the program's design, which explicitly provides payments to women heads of households, and compared how households spent PROGRESA income with how they spent all other household income. A combination of qualitative evidence and regression outputs suggest that "PROGRESA benefits increase the power of women, who are better able to assert their preferences and allocate more resources within households toward investments."⁵⁷

Cash Transfer Programs

In recent years, cash transfer programs have been widely regarded as a promising poverty alleviation strategy. Program evaluations of interventions, such as PROGRESA in Mexico and Bolsa Familia in Brazil, have found that these types of programs have the potential to improve child health and education outcomes. Several PopPov researchers have asked innovative questions about the effects of cash transfer programs: Can traditional transfer programs reduce risky sexual

behavior? Can they affect parental decisionmaking regarding girls' health and social capital outcomes? Can nontraditional cash transfer programs (behavioral interventions) influence biological outcomes?

Sinha and Yoong (2009) evaluated a state-run conditional cash transfer program in India, the purpose of which is "to discourage son preference among parents and encourage investment in daughters' education and health."⁵⁸ Using proxies for program eligibility,⁵⁹ the researchers assessed the program's effect on mothers and children, taking into account time trends and preprogram differences between the two groups. They found that the program increased the sex ratio (living daughters to sons) and investment in daughters' health.⁶⁰

Baird et al. (2009) examined the short-term impact of a conditional cash transfer program in Malawi on self-reported sexual behavior of young women ages 13 to 22. The program provided a cash transfer to young women, conditional upon returning to and staying in school.⁶¹ After one year in the program, the probability of getting married declined by more than 40 percent, and the probability of becoming pregnant declined by more than 30 percent among girls who were not in school at the beginning of the study. In addition, among all participants in the cash transfer program, the self-reported onset of sexual activity was 38 percent lower than those who did not participate in the program.⁶² The authors conclude that CCT programs in SSA represent a "win-win," since they both increase educational attainment for young women and reduce risk of infection, due to delayed onset of sexual activity.

In another facet of this Malawi-based study, Baird et al. (2012) assessed the effect of both unconditional and conditional cash transfers (conditioned upon school attendance) on reducing risky sexual behaviors. In this study, the researchers tested for prevalence of HIV and herpes simplex virus (HSV-2) and found that the transfer program "decreased the prevalence of HIV and HSV-2 infection after 18 months among girls aged 13-22 who were enrolled in school at baseline."⁶³ Given these results, the authors find that providing cash transfers to school girls could have beneficial effects on their sexual and reproductive health, and that these types of programs might be attractive to policymakers, given their potential to provide a wide variety of benefits.

To explicitly investigate the effect of incentives on sexual behavior, de Walque et al. (2011) implemented a conditional cash transfer program in Tanzania, incentivizing safe sexual behaviors by making the cash transfer conditional upon negative test results for four sexually transmitted infections (STIs).⁶⁴ This study was unique, as few RCTs have assessed behavioral interventions with biological outcomes. The STI tests were implemented and reported on every four months. At the end of the 12-month period, the adjusted results reflected a significant reduction in prevalence of the four STIs among the high cash transfer group. The authors conclude that these results show the potential for financial incentives as a useful tool in preventing HIV and STI transmission. Although the study

population is generally representative of rural and small-town environments in SSA, the authors acknowledge that the study needs to be replicated elsewhere and in a larger population before concluding that such a program is a worthwhile HIV-prevention strategy.⁶⁵

In summary, PopPov researchers have found traditional cash transfer programs to be effective in keeping girls in school and in reducing risky sexual behavior. The use of financial incentives with the sole and explicit purpose of reducing risky sexual behavior also shows promise.

Fertility Regulation and Women's Economic Activity

The PopPov research agenda prioritized specific questions regarding fertility regulation and economic activity: whether and how lower fertility contributes to women's labor supply or productivity outside the home and to more household savings. Several PopPov researchers investigated fertility's contribution to labor supply at the household level. PopPov researchers did not explicitly investigate the relationship between fertility and household savings; however, some researchers looked at savings as a component of other analyses. Rubalcava, Teruel, and Thomas (2009), for example, investigated women's autonomy and decisionmaking power within the household by isolating the impact of PROGRESA income on savings and spending decisions. They found that the additional money provided through the PROGRESA program directly to female heads of households was spent on longer-term investments in livestock and on children.

PopPov researchers have studied the relationship between fertility and women's labor force participation using within-country and cross-national analyses, with mixed results overall. Lundberg, Sinha, and Yoong (2010) have taken advantage of the Matlab family planning experiment to identify the impact of changes in fertility on female labor force participation in rural Bangladesh. In preliminary results, the researchers have found only weak associations between the number of children and female labor force participation in Matlab. Despite this weak relationship, they have seen that indicators for control over childbearing were significantly related to the sector in which a woman works, finding that women who gave birth recently are more likely to work in the informal sector and much less likely to work in the formal sector.⁶⁶

Two other PopPov research teams have investigated the connections between fertility and labor force participation more broadly by performing cross-country analyses. Using 96 DHS surveys from 59 developing countries, Porter and King exploit the occurrence of twins and the sex of the first child as an exogenous measure of fertility, and find different effects across different regions and age groups. The results show that among urban women in developing countries, having an additional unexpected child negatively influences labor force participation rates; the opposite occurs in rural areas, where an unexpected additional child leads to an increased likelihood of women's labor force participation.⁶⁷ This research

BOX 2

Migration Studies

While migration is not prominently on the suggested research agenda, the CGD working group that recommended the elements of the PopPov research agenda acknowledged that failure to take migration into account in analyses of fertility may bias some results. A series of studies look at the role of migration and its implications for population and development policy, with each using a different approach to the role and effect of migration. Mesnard and Seabright (2008) take a theoretical approach to investigate the reciprocal causality between migration and the incidence of endemic disease by modeling migration in several states. Based on the mathematical properties associated with migration and the spread of disease, they hypothesize that migration can have health benefits by reducing the incidence of disease in low-prevalence areas, wherein the healthy have stronger incentives to leave unhealthy neighborhoods than the sick.¹

To explore the role of family migration patterns and culture in rural Bangladesh, Protik and Kuhn (2006) used matching techniques and fixed-effect logistic regression models to estimate the effect of a brother's migration on his sister's marriage pattern in Matlab, Bangladesh. These researchers found "strong evidence that women with migrant brothers are more likely to marry someone from the same village and are more likely to marry someone with lower human capital."²

The authors suggest that in the absence of the traditional caregiver—her sister-in-law, who would accompany her migrant brother—the daughter who marries someone from the same village is more likely to settle near her parents and provide personal care when needed.

In yet another migration study, Beegle and Poulin (2011) look at the migration patterns among young adults within Malawi. These PopPov researchers found that young women are more likely to migrate than men are and that the predominant reasons for moves are noneconomic; women typically move because of marriage or just after marrying.³

Research such as the above may provide the basis for justifying collection of data on migration as part of fertility studies. These studies may also contribute to development of simulation models by providing an empirical basis for incorporation of migration processes into these models.

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- ¹ Alice Mesnard and Paul Seabright. (2008). Migration and the Equilibrium Prevalence of Infectious Diseases.
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- ³ Kathleen Beegle and Michelle Poulin. (2011). Migration and the Transition to Adulthood in Contemporary Malawi.

included only observations about labor force participation decisions over the past year but not about labor supply (the number of hours of worked). Similarly, Bloom et al. (2009) use a panel of 97 countries over the period 1960-2000 to analyze the relationship between lower fertility and female labor force participation.⁶⁸ To isolate the causal effect of fertility, they used country-level abortion legislation as a proxy for fertility, and found, on average, that nearly two years of work is lost for each child born.

PopPov researchers have also investigated how teen pregnancy affects mothers' education in South Africa. Mothers' education is relevant to labor force participation insofar as teen pregnancy can potentially reduce educational expectations, labor market participation, and productivity among the mothers themselves. Reduced educational expectations and lower labor market participation have negative consequences for households and economies. Ranchhod et al. (2011) investigated the effect of teen childbearing on girls' dropout rates and years of schooling completed by age 20 in Cape Town, South Africa, and found that being a teen mother correlates with reduced educational expectations. It should also be noted that most of the differences among those who give birth as teens are due to preexisting condi-

tions: Teen mothers are more likely to come from families with fewer economic resources and lower education.⁶⁹ Ardington, Menendez, and Mutevedzi (2011) also found that teenage childbearing was associated with disadvantages in educational attainment and increased risk for mortality among the teen mothers. Outcomes were worse among those girls who gave birth in their early teens than those who had their first child in their late teens.⁷⁰

These results provide initial steps to understanding how family planning and fertility can affect labor market outcomes at the household level. More rigorous methods and data sets that are better tailored to collect demographic, health, and labor force information are needed in order to bolster these types of results.

Evaluation of Family Planning and Health Programs

A few studies directly assessed the effects of family planning programs or related health programs and the programs' specific attributes. One study (Ashraf et al., 2012)—already discussed above—finds that providing family planning counseling in the presence of the husband inhibits contraceptive choices. Another (Duflo et al., 2012) finds that local context is important in determining program design for girls' education

programs on safe sexual behavior and other life skills.⁷¹ Also, some relevant results have come out of studies that look at increasing condom use or reducing risky sexual behavior among HIV-positive individuals. Earlier research (de Walque et al., 2010) showed that, in Mozambique, HIV-positive men and women's perception of risk decreased when access to anti-retroviral treatment increases, leading to an increase in risky behavior. Still, access to ART improved health and labor force participation, enabling HIV-positive households to withstand economic crises as well as other households did (de Walque et al., 2011).

IV. On Balance: Where Evidence on the PopPov Research Agenda Stands

In this final section, our effort is to describe the extent to which the catalog of supported research (completed and in progress) addresses the question of the relationships among reproductive health, population, and economic development as well as to indicate the issues not addressed and why. As we stated at the beginning of this report, the research supported under the Hewlett partnerships does not encompass the breadth of all relevant research on these issues, so we do not attempt to assess the state of all research bearing on either the thematic and policy questions or the empirical challenges.

MACRO-EVIDENCE

Macro-level analyses addressed most components of the macroeconomic research agenda, covering relevant questions ranging from the demographic transition to the effect of changes in family planning policy on economic outcomes. They also reflect the research priority given to SSA. Analyses investigating the demographic transition looked at increases in life expectancy, decreases in fertility, and population growth, and at their effects on national income, often through cross-national analyses in SSA countries. These macroeconomic analyses also took up questions of the effectiveness of modern contraceptives, effects of abortion, implications of shifts in age structure, and influence of social context such as the fertility of other women.

The most powerful empirical results from macro-level studies are the well-crafted thought experiments or simulations. A number of these included measures or parameters derived from micro-level data. Combined with knowledge gained from the micro studies (on the effect of abortion on women's labor force participation as well as the effect of social interaction on women's fertility decisions), the findings suggest an important role for family planning programs in improving individual economic outcomes and ultimately in maximizing national well-being as measured by health and income.

Analyses at the macro-level tend to be multi-country studies using pooled cross-sections or simulations. All the multi-country studies include some SSA countries, and the majority

of simulation studies use characteristics of a relevant SSA country or countries.

Two elements of the macroeconomic research agenda laid out by the working group have not been addressed in PopPov macro-level research: analysis of the effects of policy and analysis using subnational data. That these two elements are not addressed is not a coincidence. The lack of adequate data for subnational comparison of results across one country hampers the assessment of policy effects.

PopPov researchers continue to encounter methodological challenges for their analyses, primarily driven by the lack of datasets that contain both economic and reproductive health information. Although researchers have made efforts to use DHS surveys to construct aggregate "panel" data, the data in these surveys do not lend themselves to economic measurement that may be reliably aggregated from the individual or household level to subnational regions or the national level. The inadequacy of data stems mainly from the fact that subnational measures of both reproductive health and household economic conditions rarely exist in the same dataset or in large data panels.

MICRO-EVIDENCE

Micro-level analyses largely focused on examining the effect of fertility (number of children/siblings, timing/spacing of births, and contraceptive use) on women and children's health and education, as well as the evaluation of reproductive health policies and programs. On balance, the evidence suggests that early childbearing and short spacing between births have adverse effects on children's health, physical as well as cognitive development, and on mother's mortality. Fewer studies have directly investigated the influence of fertility or family planning on labor force participation. And none have, to date, focused specifically on savings and productivity.

A number of program evaluations and randomized controlled trials have added to knowledge about what works in health programs, though most results were not specifically linked to sexual behavior. Cash transfer programs appear to be effective in changing a variety of behaviors for a range of population groups (parents, children, and sex workers), at least in the short term.

RESEARCH IN PROGRESS

Some of the research currently in progress and some recently funded projects will squarely address links between reproductive health and women's empowerment. These studies look at measures of women's intrahousehold decisionmaking power and/or economic activity. They also assess effects on short-term and long-term (even intergenerational) economic outcomes such as employment and labor force participation. A number are taking advantage of experimental designs or natural social experiments to assess the effectiveness of specific family planning and health programs.

V. Conclusion

PopPov researchers have taken significant steps in advancing elements of the research agenda outlined by the working group despite data and empirical challenges. Much of the currently completed micro-level research in the PopPov initiative examines the pathways between family planning, reproductive health, and health outcomes for women and children. The results point to the importance of family planning, access to reproductive health services, and mother's health for both mother and children's short-term and long-term health. Taken in conjunction with the macroeconomic research, findings on the long-term effects of health on GDP as well as implications for social welfare, the research underscores the benefits of improvements in access to family planning and reproductive health services. The research also identifies some promising activities, including integrated family planning and reproductive health services, increased access to information and reproductive health services, and the power of cash incentives or income supplements. Table 4 provides a short list of results from several studies that specifically assessed health interventions, including family planning, nutrition, and HIV/AIDS programs. Each study's findings are unique to the individual context, though a few types of programs show particular promise, either across multiple studies or settings, including cash transfer and midwifery programs.

To extend microeconomic research results beyond the local context of the study and specific program, it will be important to examine these findings in conjunction with the broader evidence available either for that country or for the types of programs of interest.⁷² While some studies may not be conclusively generalizable, they can provide an invaluable empirical foundation for policymakers and program managers to consider new program designs or changes to existing programs.

The working group report envisioned a research agenda that would provide new evidence applicable to budgetary and programmatic decisions. PopPov researchers have also generated new evidence by collecting data and producing much-needed datasets; by finding new instruments and using innovative evaluation methodologies to realize causal inference in macroeconomic analyses; and by evaluating country- and region-specific programs and policies on the microeconomic level. Some PopPov researchers are already making their results available to in-country audiences,⁷³ and in at least a few cases, policymakers have used these findings when making recommendations and decisions related to reproductive health and family planning. Additional PopPov research findings can also be used for presenting country-specific results, particularly making those that assessed specific programs or interventions available to the appropriate in-country audience.

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- 1 These questions are based on *Population Dynamics and Economic Development: Elements of a Research Agenda: Final Working Group Report* (Washington, DC: Center for Global Development, 2005), accessed at www.cgdev.org/doc/populationdevelopment/fullpopdevreportENG.pdf.
- 2 For the purposes of this report, researchers and research results from the grant-awarding partnerships are all referred to as "PopPov," but all the granting schemes do not officially use this moniker. The Research Council of Norway's scheme is ECONPOP; the NWO/WOTRO scheme is PopDev; the IRD scheme is DEMENTREND; and ESRC's scheme has no internally specified program name. In this report, the term "PopPov" also encompasses the Hewlett/IIE Dissertation Fellows Award and Hewlett/PRB Dissertation Awards.
- 3 Members of the 2005 Population and Development Group included Alaka Basu, John Bongaarts, David Canning, Ibrahim Elbadawi, Alex Ezeh, Andrew Foster, Alan Gelb, James Habyarimana, Simon Johnson, Calestous Juma, Cynthia Lloyd, Elizabeth Lule, Todd Moss, Mead Over, John Page, Lant Pritchett, Geeta Rao, Khama Rogo, T. Paul Schultz, and Chris Udry.
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- tool. The research team's findings suggest that a woman's cultural group, as captured by the vernacular neighborhoods, appears to be more influential in the decision to delay marriage, whereas status is a more important predictor of fertility within the marriage. Weeks, John R., Getis, Arthur, Hill, Allan G., Agyei-Mensah, Samuel & Rain, David. (2010). Neighborhoods and Fertility in Accra, Ghana: An AMOEBa-based Approach.
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 - 37 Filmer, Friedman, Schady. (2009), Development, Modernization, and Childbearing
 - 38 Fertility regulation is the process individuals use to control their reproduction. Methods of regulation include delayed childbearing, using modern contraceptives, and abstinence.
 - 39 Baird, Sarah, Chirwa, Ephraim & McIntosh, Craig. (2009). The short-term impacts of a schooling conditional cash transfer program on the sexual behavior of young women. *Health Economics*, 55-68; Baird, Sarah, Garfein, Richard S, McIntosh, Craig T & Ozler, Berk. (2012). Effect of a cash transfer programme for schooling on prevalence of HIV and herpes simplex type 2 in Malawi: a cluster randomised trial. *Lancet*, 379 (9823), 1320-29; Baird, Sarah, McIntosh, Craig & Ozler, Berk. (2011). Cash or condition? Evidence from a cash transfer experiment. *The Quarterly Journal of Economics*, 126 (4), 1709-53; de Walque, Damien, Dow, William H., Nathan, Rose, Abdul, Ramadhani, Abilahi, Faraji, Gong, Erick, Isdahl, Zachary, Jamison, Julian & Jullu, Boniphace. (2012). Incentivising safe sex: a randomised trial of conditional cash transfers for HIV and sexually transmitted infection prevention in rural Tanzania. *BMJ Open*, 2 (1), 1-10; Farfan, Gabriela, Genoni, Maria E., Rubalcava, Luis, Teruel, Graciela & Thomas, Duncan. (2011). Oportunidades and its Impact on Child Nutrition; Rubalcava, Luis, Teruel, Graciela & Thomas, Duncan. (2009). Investments, Time Preferences, and Public Transfers Paid to Women. *Economic Development and Cultural Change*, 57 (3), 507-38; Sinha, Nistha & Yoong, Joanne Kannan. (2009). Long-Term Financial Incentives and Investment in Daughters Evidence from Conditional Cash Transfers in North India.
 - 40 Ashraf, Nava, Field, Erica & Lee, Jean. (2010). Household Bargaining and Excess Fertility: An Experimental Study in Zambia; Baird, Sarah, Chirwa, Ephraim & McIntosh, Craig. (2009). The Short-Term Impacts of a Schooling Conditional Cash Transfer Program on the Sexual Behavior of Young Women. *Health Economics*, 55-68.; Baird, Sarah, Garfein, Richard S, McIntosh, Craig T & Ozler, Berk. (2012). Effect of a cash transfer programme for schooling on prevalence of HIV and herpes simplex type 2 in Malawi: a cluster randomised trial. *Lancet*, 379 (9823), 1320-29.; Baird, Sarah, McIntosh, Craig & Ozler, Berk. (2011). Cash or Condition? Evidence from a Cash Transfer Experiment. *The Quarterly Journal of Economics*, 126 (4), 1709-53; de Walque, Damien, Dow, William H., Nathan, Rose, Abdul, Ramadhani, Abilahi, Faraji, Gong, Erick, Isdahl, Zachary, Jamison, Julian & Jullu, Boniphace. (2012). Incentivising safe sex: a randomised trial of conditional cash transfers for HIV and sexually transmitted infection prevention in rural Tanzania. *BMJ Open*, 2 (1), 1-10; Fitzsimons, Emla, Malde, Bansi, Mesnard, Alice & Vera-Hernández, Marcos. (2012). Household responses to information on child nutrition: experimental evidence from Malawi.
 - 41 Longwe, Abiba & Smits, Jeroen. (2012). Family Planning Outcomes and Primary School Attendance in Sub-Saharan Africa. *Studies in Family Planning*, 43 (2), 127-34.
 - 42 Longwe, Abiba and Smits, Jeroen. (Forthcoming). The impact of family planning on primary school participation in sub-national areas within 25 African countries. *African Journal of Reproductive Health*, 17 (2).
 - 43 Propensity score matching is a statistical technique which allows researchers to match individuals from the "control" group to "treatment" group usually by estimating the likelihood that an individual will participate in a program, or in this

- case, the likelihood that a child would be mistimed or unwanted, on the basis of a number of relevant characteristics. Other PopPov research teams have used these techniques, notably the team headed by Lam and Leibbrandt in South Africa.
- 44 Baschieri, Angela, Floyd, Sean, Cleland, John, Dube, Albert, Molesworth, Anna, Chihana, M, Glynn, Judith, Crampin, A. C. & French, Neil. (2012). An application of propensity score matching to assessment of the impact of unintended childbearing on children's growth in Northern Malawi.
 - 45 Email communication with Baschieri on April 27, 2013.
 - 46 Until 1991, South African law divided the population into four major racial categories: "African" or "black" South Africans, who account for nearly 75 percent of South Africa's entire population (and include several groups such as Khoi-San, Xhosa, Zulu, Ndebele, Sotho, Shangaan, and Venda, among others); "white" South Africans, who account for about 13 percent of the population; "Asian" South Africans, who account for nearly 3 percent; and "colored" South Africans, who are of mixed white and African descent and account for 9 percent of the population. Although the South African law of racial categories has been abolished, many South Africans still view themselves according to these categories.
 - 47 Branson, Nicola, Ardington, Cally & Leibbrandt, Murray. (2011). Health outcomes for children born to teen mothers in Cape Town, South Africa.
 - 48 Cresswell, Jenny a, Campbell, Oona M R, De Silva, Mary J & Filippi, Véronique. (2012). Effect of maternal obesity on neonatal death in sub-Saharan Africa: multivariable analysis of 27 national datasets. *The Lancet*, 380 (9850), 1325-30.
 - 49 Cas, Ava Gail. (2011). Long-run Cognitive and Education Impacts of Early Life Public Health Intervention: Evidence from Safe Motherhood Program in Indonesia.
 - 50 Nikolov, Plamen. (2012). The Cognitive Link between in Utero Nutrition and Development: Micronutrient Deficiency, Schooling Attainment, and Economic Outcomes in Tanzania.
 - 51 Fung, Winnie & Ha, Wei. (2009). Intergenerational Effects of the 1959-61 China Famine.
 - 52 If a woman's last child or current pregnancy was unwanted, or if she does not want children and is not using contraception, then a woman is considered to have unmet need.
 - 53 Ashraf, Nava, Field, Erica & Lee, Jean. (2013). Household bargaining and excess fertility: an experimental study in Zambia. *American Economic Review* (forthcoming).
 - 54 Ashraf, Nava, Field, Erica & Lee, Jean. (2013). Household bargaining and excess fertility: an experimental study in Zambia. *American Economic Review* (forthcoming).
 - 55 "Excess fertility" is defined as residual live births above and beyond a woman's reported ideal family size.
 - 56 Implants and injectables were offered for free; other forms of modern contraception were already available at the clinic at the time of the experiment.
 - 57 Rubalcava, Luis, Teruel, Graciela & Thomas, Duncan. (2009). Investments, Time Preferences, and Public Transfers Paid to Women. *Economic Development and Cultural Change*, 57 (3), 507-38.
 - 58 Sinha, Nistha & Yoong, Joanne Kannan. (2009). Long-Term Financial Incentives and Investment in Daughters Evidence from Conditional Cash Transfers in North India.
 - 59 Data was not formally collected for the purpose of evaluating the program, so researchers used three cross-sections of household survey data over the period that the program was implemented. To construct the sample, Sinha and Yoong identified poverty criteria using household asset information and combined this data with caste affiliation in order to construct a dataset with households eligible and not eligible for the program.
 - 60 The research team used the intent to treat estimator, which meant that they estimated the program effects among those who were offered the program. Results are evidenced by a significant increase in the number of vaccinations and the probability of ever receiving a vaccination among eligible girls.
 - 61 Girls who were dropped out of school at baseline were encouraged to re-enroll, and subsequently, to stay in school through the conditional cash transfer.
 - 62 Baird, Sarah, Chirwa, Ephraim & McIntosh, Craig. (2009). The Short-Term Impacts of a Schooling Conditional Cash Transfer Program on the Sexual Behavior of Young Women. *Health Economics*, 55-68.
 - 63 Baird, Sarah, Garfein, Richard S, McIntosh, Craig T & Ozler, Berk. (2012). Effect of a cash transfer programme for schooling on prevalence of HIV and herpes simplex type 2 in Malawi: a cluster randomised trial. *Lancet*, 379 (9823), 1320-29. The researchers did not find a difference in STD outcomes between the conditional and unconditional groups.
 - 64 *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Trichomonas vaginalis* and *Mycoplasma genitalium*.
 - 65 de Walque, Damien, Dow, William H., Nathan, Rose, Abdul, Ramadhani, Abilahi, Faraji, Gong, Erick, Isdahl, Zachary, Jamison, Julian & Jullu, Boniphace. (2012). Incentivising safe sex: a randomised trial of conditional cash transfers for HIV and sexually transmitted infection prevention in rural Tanzania. *BMJ Open*, 2 (1), 1-10.
 - 66 Lundberg, Mattias, Sinha, Nistha & Yoong, Joanne Kannan. (2010). Fertility and women's labor force participation in a low-income rural economy.
 - 67 Results are statistically significant among urban women, age 25-34 in Latin America and the Caribbean.
 - 68 Bloom, David E., Canning, David, Fink, Günther & Finlay, Jocelyn E. (2009). Fertility, Female Labor Force Participation, and the Demographic Dividend. *Journal of Economic Growth*, 14, 79-101.
 - 69 Ranchhod, Vimal, Lam, David, Leibbrandt, Murray & Marteleto, Leticia. (2011). Estimating the effect of adolescent fertility on educational attainment in Cape Town using a propensity score weighted regression.
 - 70 Ardington, Cally, Menendez, Alicia & Mutevedzi, Tinofa. (2011). Early childbearing, human capital attainment and mortality risk.
 - 71 Duflo, Esther, Dupas, Pascaline, Huillery, Elise, & Seban, Juliette. (2012). PUNCHY Information, Groggy Students? Experimental Evidence from Cameroon on School-Based HIV Education.
 - 72 Osvaldo Néstor Feinstein, Robert Piccio. (2000). *Evaluation and Poverty Reduction: Selected Proceedings from a World Bank Seminar*. These proceedings include comments on the tradeoff between generalizability and causal inference in pp.76-86.
 - 73 These include teams lead by Alan Hill in Ghana, Veronique Filippi in Burkina Faso, Murray Leibbrandt in South Africa, and Nava Ashraf in Zambia.

TABLE 1

**PopPov Research Outputs From January 2006
to September 2012***

OUTPUT TYPE	NUMBER
Research Grants Awarded ^a	46
Dissertation Fellows Funded ^b	49
Academic Publications ^c	59
Working Papers ^d	67
Research Conferences	7

* See Appendix B for project descriptions. See Appendix C for project publications.
a Does not include AERC internal funding of projects and does not count sub-projects.
b Does not include post-doctoral research fellows engaged in research projects.
c Articles in scholarly journals and book chapters.
d Includes works in progress, reports, dissertations as well as publications labeled working papers.

TABLE 2

Timeline for PopPov Research Activities 2005-2012

DATE	KEY EVENTS/MILESTONES
July 2005	Center for Global Development (CGD) working group's final report identifies research agenda elements that would inform current policy decisions with the ultimate intent of achieving higher economic growth and faster reduction in poverty rates.
October – November 2005	Hewlett awards grant to Population Reference Bureau (PRB) to support research teams based in U.S. institutions and to support Ph.D. dissertation fellows.
December 2005	Hewlett makes a grant to the World Bank to study support research program on fertility, reproductive health, and socioeconomic outcomes.
June 2006	Hewlett makes a grant to PRB to support research teams that include partnerships with developing country institutions.
November 2006	1st Annual PopPov Research Conference.
December 2006	Hewlett partners with Economic and Social Research Council in the United Kingdom. The first award is made in November 2007 with 3 more to follow in April 2008. Topics investigated the effects of a variety of reproductive health events/ conditions on economic well-being. (www.esrc.ac.uk/about-esrc/what-we-do/our-research/Economic-development.aspx)
January 2007	PRB awards grants to U.S. research teams.
April 2007	World Bank hosts research workshop.
September 2007	Hewlett makes award to NWO/WOTRO for support of joint research program. (www.nwo.nl/wotro/popdev)
November 2007	Hewlett makes first award to Institute for International Education (IIE) to support dissertation fellows, with the most recent IIE call for applications scheduled for 2013. (www.iie.org/Programs/Hewlett-IIE-Fellowship)
December 2007	PRB awards grants to bilateral/multinational teams.
July 2008	Hewlett makes grant to Harvard University to investigate economic impacts of population and reproductive health.
May 2008	Methods Workshop at Duke University.
November 2008	Hewlett makes awards to: (1) l'Institut de recherche pour le développement (IRD) to support research on population and reproductive health in Africa (www.aird.fr/nos-programmes/programmes-de-recherche/demtrend); (2) CGD to support research on population and reproductive health.
March 2009	Hewlett Foundation awards grant to Research Council of Norway (RCN) to support research on economic growth, poverty reduction, reproductive health, and population dynamics. (www.forskningsradet.no/prognnett-norglobal/ECONPOP/1244023236292)
July 2009	Hewlett Foundation awards grants to: (1) International Health Economics Association (https://www.healthconomics.org/) for support of an electronic Journal on Population and Reproductive Health Economics and (2) Duke University for the BREAD (http://ipl.econ.duke.edu/bread/index.htm) development economics research network's activities on population/ reproductive health.
November 2009	Hewlett Foundation awards funds to African Economic Research Consortium for communicating research on economic development, reproductive health, and population dynamics.
December 2009	Hewlett Foundation awards grant to Yale University for research on reproductive health in Ghana.
November 2010	Workshop on Mixed Methods, London School of Hygiene and Tropical Medicine.
July 2010	Hewlett Foundation awards grant to Aspen Institute for support of the Global Leaders Council for Reproductive Health.
November 2010	Hewlett Foundation awards grant to PRB for communication and dissemination of population-poverty research.
January 2011	5th Annual Research Conference celebrates international research corps, and PRB assumes role of Secretariat.
December 2011	ESRC, NWO/WOTRO, RCN, and PRB issue a joint call for proposals to address research gaps.
July 2012	Hewlett Foundation awards grant to PRB for research and dissemination of economic impacts of population and reproductive health.
October 2012	First awards from the joint call made.

TABLE 3a

Research Outputs Address Empirical Challenges Identified in PopPov Research Agenda

EMPIRICAL CHALLENGES	SELECTED RELEVANT PUBLICATIONS
Causality	<p>Macro-Level Outcomes Developed From Micro-Level Inputs</p> <ol style="list-style-type: none"> Ashraf, Quamrul, Weil, David N. & Wilde, Joshua. (2013). The Effect of Fertility Reduction on Economic Growth. <i>Population and Development Review</i>, 39 (1), 97-130. <p>Natural Experiments</p> <ol style="list-style-type: none"> McKelvey, Christopher, Thomas, Duncan & Frankenberg, Elizabeth. (2012). Fertility Regulation in an Economic Crisis. <i>Economic Development and Cultural Change</i>, 61 (1), 7-38. Baird, Sarah, Friedman, Jed & Smitz, Marc. (2010). Climate Variability and Infant Mortality in Africa. (See also studies using random assignment below.)
Measurement of Difficult Concepts	<p>Women's Empowerment</p> <ol style="list-style-type: none"> Ashraf, Nava, Field, Erica & Lee, Jean. Household Bargaining and Excess Fertility: An Experimental Study in Zambia. September 2013. (2nd Revision Resubmitted, American Economic Review.) Rubalcava, Luis, Teruel, Graciela & Thomas, Duncan. (2009). Investments, Time Preferences, and Public Transfers Paid to Women. <i>Economic Development and Cultural Change</i>, 57 (3), 507-538. <p>Expansion of Social Networks</p> <ol style="list-style-type: none"> McNiven, Scott & Gilligan, Daniel O. (2012). <i>Networks and Constraints on the Diffusion of a Biofortified Agricultural Technology: Evidence from a Partial Population Experiment</i> (Job market paper). University of California, Davis. Gondal, N. (2012). Who "Fills in" for Siblings and How? A Multilevel Analysis of Personal Network Composition and Its Relationship to Sibling Size. <i>Sociological Forum</i>, 27: 732-755.
Data Contributions	<p>Collection of Both Demographic and Economic Data in Cross-Sectional Household Data</p> <ol style="list-style-type: none"> Baschieri, Angela, Floyd, Sean, Cleland, John, Dube, Albert, Molesworth, Anna, Chihana, M, Glynn, Judith, Crampin, A. C. & French, Neil. (2012). An application of propensity score matching to assessment of the impact of unintended childbearing on children's growth in Northern Malawi. Presentation at Population Association of America Meetings, 2012. <p>Panel Data: Collection for African Sites</p> <ol style="list-style-type: none"> Douptcheva, Nedialka, Hill, Allan G., Adanu, Richard, Anarfi, John, Blanchard, Kelly, Fink, Günther, Lince, Naomi & Oliveras, Isaac Osei-Akoto. (2011). Women's Health Study of Accra: Wave II (WHSa-II). Kazianga, H., Kouanda, S., Nikema, L., Rothenbuhler, E., Over, Mead & de Walque, Damien. (2010). HIV services delivery and overall quality of care and satisfaction in Burkina Faso: are there privileged patients? Unpublished Working Paper, accessed at www.hkazianga.org. Beegle, Kathleen, & Poulin, Michelle. (2012). Migration and the transition to adulthood in contemporary Malawi (World Bank Policy Research Working Paper No. 6200). de Walque, Damien, Kazianga, Harounan, & Over, Mead. (2011). Antiretroviral therapy awareness and risky sexual behaviors: evidence from Mozambique (Center for Global Development Working Paper No. 239). de Walque, Damien, Kazianga, Harounan, Over, Mead & Vaillant, Julia. (2011). Food Crisis, Household Welfare, and HIV/AIDS Treatment: Evidence from Mozambique (Center for Global Development Working Paper No. 238). <p>Random Assignment</p> <ol style="list-style-type: none"> Ashraf, Nava, Field, Erica & Lee, Jean. Household Bargaining and Excess Fertility: An Experimental Study in Zambia. September 2013. (2nd Revision Resubmitted, American Economic Review.) Baird, Sarah, Chirwa, Ephraim & McIntosh, Craig. (2009). The Short-Term Impacts of a Schooling Conditional Cash Transfer Program on the Sexual Behavior of Young Women. <i>Health Economics</i>, 19 (1), 55-68. Baird, Sarah, Garfein, Richard S, McIntosh, Craig T & Ozler, Berk. (2012). Effect of a cash transfer programme for schooling on prevalence of HIV and herpes simplex type 2 in Malawi: a cluster randomised trial. <i>Lancet</i>, 379 (9823), 1320-9. Baird, Sarah, McIntosh, Craig & Ozler, Berk. (2011). Cash or Condition? Evidence from a Cash Transfer Experiment. <i>The Quarterly Journal of Economics</i>, 126 (4), 1709-1753. de Walque, Damien, Dow, William H., Nathan, Rose, Abdul, Ramadhani, Abilahi, Faraji, Gong, Erick, Isdahl, Zachary, Jamison, Julian & Jullu, Boniphace. (2012). Incentivising safe sex: a randomised trial of conditional cash transfers for HIV and sexually transmitted infection prevention in rural Tanzania. <i>BMJ Open</i>, 2 (1), 1-10. Fitzsimons, Emla, Malde, Bansi, Mesnard, Alice & Vera-Hernández, Marcos. (2012). Household responses to information on child nutrition: experimental evidence from Malawi (Centre for Economic Policy Research (CEPR) Discussion Paper No. DP8915). <p>Data-Collection/Follow-Up to Random Assignment</p> <ol style="list-style-type: none"> Nikolov, Plamen. (2011). <i>The Cognitive Link between in Utero Nutrition and Development: Micronutrient Deficiency, Schooling Attainment, and Economic Outcomes in Tanzania</i> (Doctoral dissertation). Harvard University, Cambridge, MA. McNiven, Scott & Gilligan, Daniel O. (2012). <i>Networks and Constraints on the Diffusion of a Biofortified Agricultural Technology: Evidence from a Partial Population Experiment</i> (Job market paper). University of California, Davis. <p>Data for Subnational Comparisons</p> <ol style="list-style-type: none"> Longwe, Abiba and Smits, Jeroen. (Forthcoming). The impact of family planning on primary school participation in sub-national areas within 25 African countries. <i>African Journal of Reproductive Health</i>, 17 (2).

TABLE 3b

Research Outputs Address Thematic Elements of PopPov Research Agenda

THEMES/QUESTIONS BY POLICY RELEVANCE	SELECTED RELEVANT PUBLICATIONS
Macroeconomic Policy	<p>Effects of Policy on Economic Growth & Poverty Incidence</p> <ol style="list-style-type: none"> 1. DasGupta, Monica, Bongaarts, J. & Cleland, John. (2011). Population, Poverty, and Sustainable Development: A Review of the Evidence (World Bank Policy Research Working Paper No. 5719). 2. Bloom, David E., Canning, David, Fink, Günther & Finlay, Jocelyn E. (2009). Fertility, Female Labor Force Participation, and the Demographic Dividend. <i>Journal of Economic Growth</i>, 14, 79-101. 3. Temel, Tugrul. (2011). Family planning, growth and income distribution in Rwanda: SAM multiplier and graph-theoretic path analysis (MPRA Paper no. 31394, Development Research Institute, Universiteiten Tilburg). <p>Effects of Fertility & Mortality Trends on Growth and Poverty</p> <ol style="list-style-type: none"> 1. Ashraf, Quamrul, Weil, David N. & Wilde, Joshua. (2013). The Effect of Fertility Reduction on Economic Growth. <i>Population and Development Review</i>, 39 (1), 97-130. 2. Weil, David N. (2010). Endemic diseases and African economic growth: challenges and policy responses. <i>Journal of African Economies</i>, 19 (3), 81-109. 3. Bloom, David E., Canning, David, Hu, L., Mahal, A., Liu, Y. & Yip, W. (2010). The contribution of population health and demographic change to economic growth in China and India. <i>Journal of Comparative Economics</i>, 38 (1), 17-33. 4. Wilde, Joshua. (2011). How Substitutable are Fixed Factors in Production (MPRA Paper no. 39844). 5. Amaral, Ernesto F. L. et al. (2007). Demographic Change and the Structure of Wages: A Demand-Theoretic Analysis for Brazil (National Bureau for Economic Research Working Paper no. 13533). 6. Santaaulalia-Llopis, Raul. (2008). Aggregate Effects of AIDS on Development. (Doctoral dissertation.) University of Pennsylvania.
Poverty Reduction Policy	<ol style="list-style-type: none"> 1. Eyal, Katherine, & Woolard, Ingrid. (2011). Throwing the Book at the CSG (Southern Africa Labour and Development Research Unit (SALDRU) Working Paper No. 53). 2. Lundberg, Mattias, Sinha, Nistha & Yoong, Joanne Kannan. (2010). Fertility and women's labor force participation in a low-income rural economy. Unpublished paper, accessed at www2.econ.iastate.edu. 3. Radhakrishnan, Uma. (2010). A Dynamic Structural Model of Contraceptive Use and Employment Sector Choice for Women in Indonesia (Population and Economic Development Working Paper No. 10-01).
Health-Related Policy	<p>Effect of Types of Investments in RH on Individual Outcomes See "Random Assignment" in "Data Contributions" section</p> <p>Effects of Type and Organization of Services on Effectiveness</p> <ol style="list-style-type: none"> 1. Adanu, Richard, Seffah, Joseph, Anarfi, John, Lince, Naomi & Blanchard, Kelly. (2012). Sexual and Reproductive Health in Accra, Ghana. <i>Ghana Medical Journal</i>, 46 (2), 58-65. 2. Kakoko, Deodatus, Ketting, Evert, Kamazima, Switbert & Ruben, Ruerd. (2011). Provision of Family Planning Services in Tanzania: A Comparative Analysis of Public and Private Facilities. <i>African Journal of Reproductive Health</i>, 16 (4), 140-148. <p>Adolescents</p> <ol style="list-style-type: none"> 1. Baird, Sarah, Garfein, Richard S, McIntosh, Craig T & Ozler, Berk. (2012). Effect of a cash transfer programme for schooling on prevalence of HIV and herpes simplex type 2 in Malawi: a cluster randomised trial. <i>Lancet</i>, 379 (9823), 1320-29. 2. Baird, Sarah, de Hoop, Jacobus & Ozler, Berk. (2011). Income shocks and adolescent mental health. <i>The Journal of Human Resources</i>, 49 (2), 370-403. 3. Baird, Sarah, McIntosh, Craig & Ozler, Berk. (2011). Cash or Condition? Evidence from a Cash Transfer Experiment. <i>The Quarterly Journal of Economics</i>, 126 (4), 1709-1753. 4. Baird, Sarah, Chirwa, Ephraim & McIntosh, Craig. (2009). The Short-Term Impacts of a Schooling Conditional Cash Transfer Program on the Sexual Behavior of Young Women. <i>Health Economics</i>, 19 (1), 55-68. <p>Integration of RH and HIV/AIDS Programming/How Benefiting Specific Populations</p> <ol style="list-style-type: none"> 1. Duflo, Esther, Dupas, Pascaline, Huillery, Elise, & Seban, Juliette. (2013). <i>Impacts of School-Based HIV Education on Reported Behavior and Knowledge of Adolescent Girls</i>. Paris: Jameel-Poverty Action Lab at the Paris School of Economics. 2. de Walque, Damien, Kazianga, Harounan, & Over, Mead. (2011). Antiretroviral therapy awareness and risky sexual behaviors: evidence from Mozambique (Center for Global Development Working Paper No. 239). 3. McLaren, Zoe. (2011). <i>The Effect of Access to AIDS Treatment on Employment Outcomes in South Africa</i>. (Doctoral dissertation.) University of Michigan, Ann Arbor.

TABLE 4

Results From Micro-Level Studies Assessing Health Programs/Interventions

**Although the outcomes from these studies may be referenced, they should be regarded with caution when applying them outside of the context of the study; many of these studies were implemented in country- or region-specific contexts.

POLICY AREA	STUDIES	RESULTS
Family Planning Program/ Intervention	<ol style="list-style-type: none"> 1. Longwe, Abiba & Smits, Jeroen. (Forthcoming). The impact of family planning on primary school enrolment in sub-national areas within 25 African countries. <i>African Journal of Reproductive Health</i>, 17 (2). 2. Cas, Ava Gail. (2012). <i>Early Life Public Health Intervention and Adolescent Cognition: Evidence from the Safe Motherhood Program in Indonesia</i> (Job market paper). Duke University, Durham, NC. 3. Ashraf, Nava, Field, Erica & Lee, Jean. (2012). Household Bargaining and Excess Fertility: An Experimental Study in Zambia. 4. Frankenberg, Elizabeth, Buttenheim, Alison, Sikoki, Bondan & Suriastini, Wayan. (2009). Do women increase their use of reproductive health care when it becomes more available? Evidence from Indonesia. <i>Studies in Family Planning</i>, 40 (1), 27-38. 	<ol style="list-style-type: none"> 1. Increased access to modern contraceptives is linked to decreased number of live births. (SSA) 2. Children with a mother who has increased access to midwives in rural areas experience significant increases in years of education and cognitive test scores. (Indonesia) 3. Married women receiving access to contraception by themselves are more likely to redeem vouchers for contraception and to use concealable contraceptives. They also report lower subjective well-being than other study participants. (Zambia) 4. Placement of village midwives in communities increases women's receipt of iron tablets and skilled child-delivery. Less-educated women are more likely to increase use of antenatal care within first trimester of pregnancy. (Indonesia)
Nutrition Intervention/ Program	<ol style="list-style-type: none"> 1. Nikolov, Plamen. (2011). <i>The Cognitive Link between in Utero Nutrition and Development: Micronutrient Deficiency, Schooling Attainment, and Economic Outcomes in Tanzania</i> (Doctoral dissertation). Harvard University, Cambridge, MA. 2. Fitzsimons, Emla, Malde, Bansi, Mesnard, Alice & Vera-Hernández, Marcos. (2012). Household responses to information on child nutrition: experimental evidence from Malawi (Centre for Economic Policy Research (CEPR) Discussion Paper No. DP8915). 3. Jain, Monica. (2011). <i>India's struggle against malnutrition - Is the ICDS program the answer?</i> (Doctoral dissertation). University of California, Riverside. 	<ol style="list-style-type: none"> 1. Ten years after HIV-negative pregnant women received micronutrients, there is some evidence that their children have improved cognitive outcomes as a result of the micronutrient supplementation. (Tanzania) 2. Information interventions involving provision of information on infant feeding to mothers with infants 6 months and younger results in significant improvements in young children's health. (Malawi) 3. Girls age 0-2 who receive daily supplemental feeding experience positive health benefits, being at least 1cm (.4 z-score) longer than other girls in rural India. (India)
HIV/AIDS Intervention	<ol style="list-style-type: none"> 1. Duflo, Esther, Dupas, Pascaline, Huillery, Elise, & Seban, Juliette. (2013). <i>Impacts of School-Based HIV Education on Reported Behavior and Knowledge of Adolescent Girls</i>. Paris: Jameel-Poverty Action Lab at the Paris School of Economics 2. Baird, Sarah, Garfein, Richard S.; McIntosh, Craig T.; & Ozler, Berk. (2012). Effect of a cash transfer programme for schooling on prevalence of HIV and herpes simplex type 2 in Malawi: a cluster randomised trial. <i>Lancet</i>, 379 (9823), 1320-9. 3. de Walque, Damien, Dow, William H., Nathan, Rose, Abdul, Ramadhani, Abilahi, Faraji, Gong, Erick, Isdahl, Zachary, Jamison, Julian & Jullu, Boniphace. (2012). Incentivising safe sex: a randomised trial of conditional cash transfers for HIV and sexually transmitted infection prevention in rural Tanzania. <i>BMJ Open</i>, 2 (1), 1-10. 	<ol style="list-style-type: none"> 1. There is no silver bullet in the realm of HIV prevention education interventions. Different messages and delivery types resulted in different effects in different areas of Cameroon, suggesting that local context is an important fact to consider when designing such interventions. Girls tended to share information that they learned from the intervention with friends, which should motivate additional investment in HIV education. (Cameroon) 2. Cash transfer programs can reduce HIV and HSV-2 infections among school-aged women in low-income settings. Interventions without a direct focus on sexual behavior change but that financially empower young women can still impact rates of HIV and HSV-2 infection. (Malawi) 3. CCTs based on negative results of periodic STI screenings may be a useful tool for STI prevention. There was a significant reduction in the combined point prevalence of four curable STIs after 12 months among those who received a high CCT. (Tanzania)
Other Health Interventions	<ol style="list-style-type: none"> 1. Sinha, Nistha & Yoong, Joanne Kannan. (2009). Long-Term Financial Incentives and Investment in Daughters: Evidence from Conditional Cash Transfers in North India. The World Bank Policy Research Working Paper 4860. 2. Baird, Sarah, Chirwa, Ephraim & McIntosh, Craig. (2009). The Short-Term Impacts of a Schooling Conditional Cash Transfer Program on the Sexual Behavior of Young Women. <i>Health Economics</i>, 19 (1), 55-68. 	<ol style="list-style-type: none"> 1. Cash transfer program that offers financial incentives to families who give birth to daughters increases the sex ratio (living daughters to sons) and investment in daughters' health. (India) 2. CCT program for school enrollment leads to large increases in school enrollment, and among the women who increase their school enrollment, shows significant declines in early marriage, teenage pregnancy, and self-reported sexual activity. (Malawi)