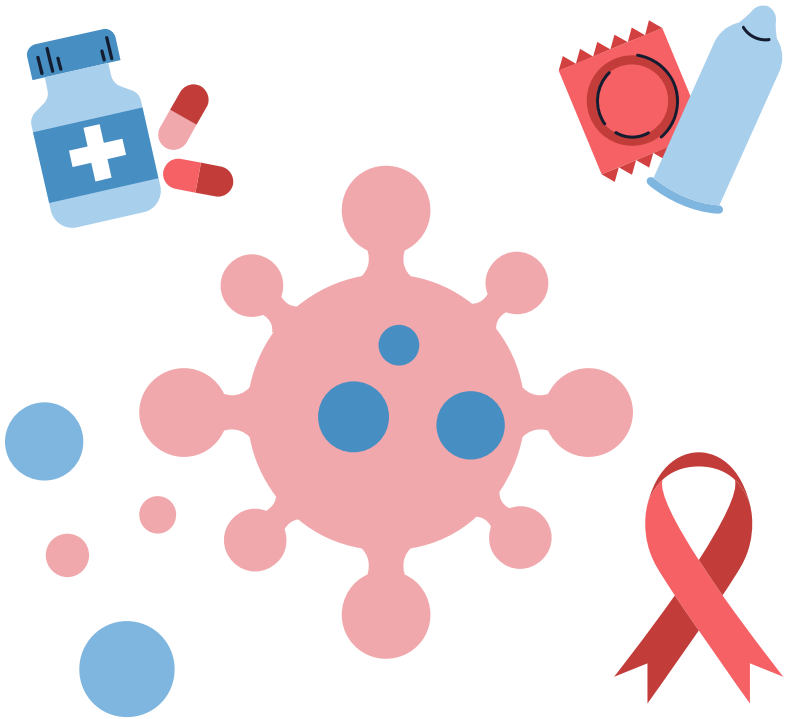
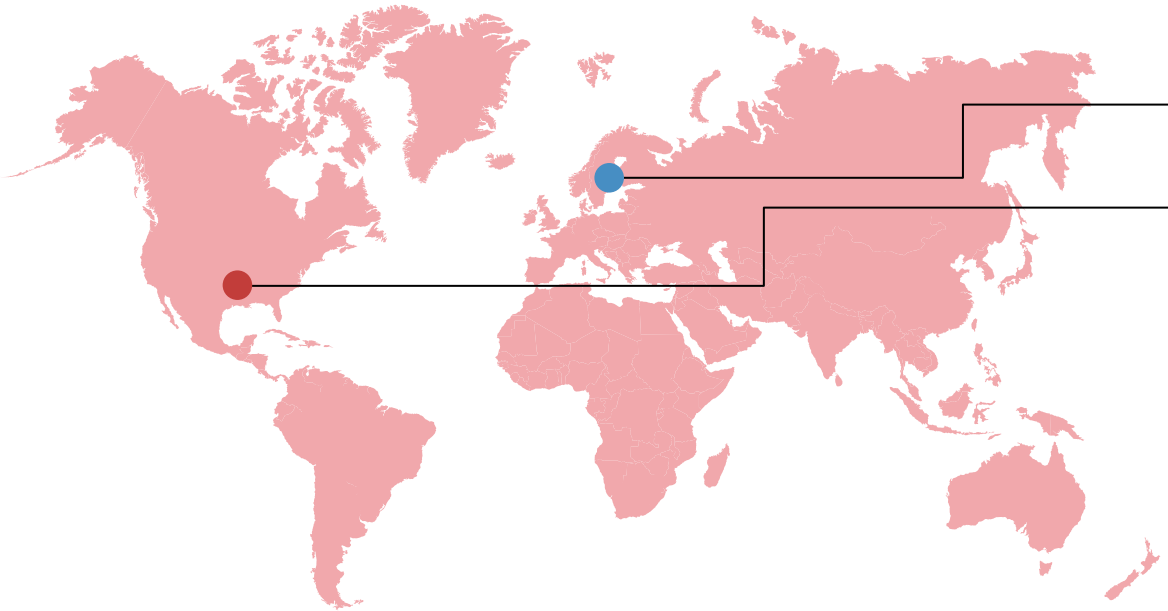
Group 5



# Population Control Policies and Fertility Convergences

# World's population from 1960 - 2013

## 20th century: Increase in life expectancy → Overpopulation



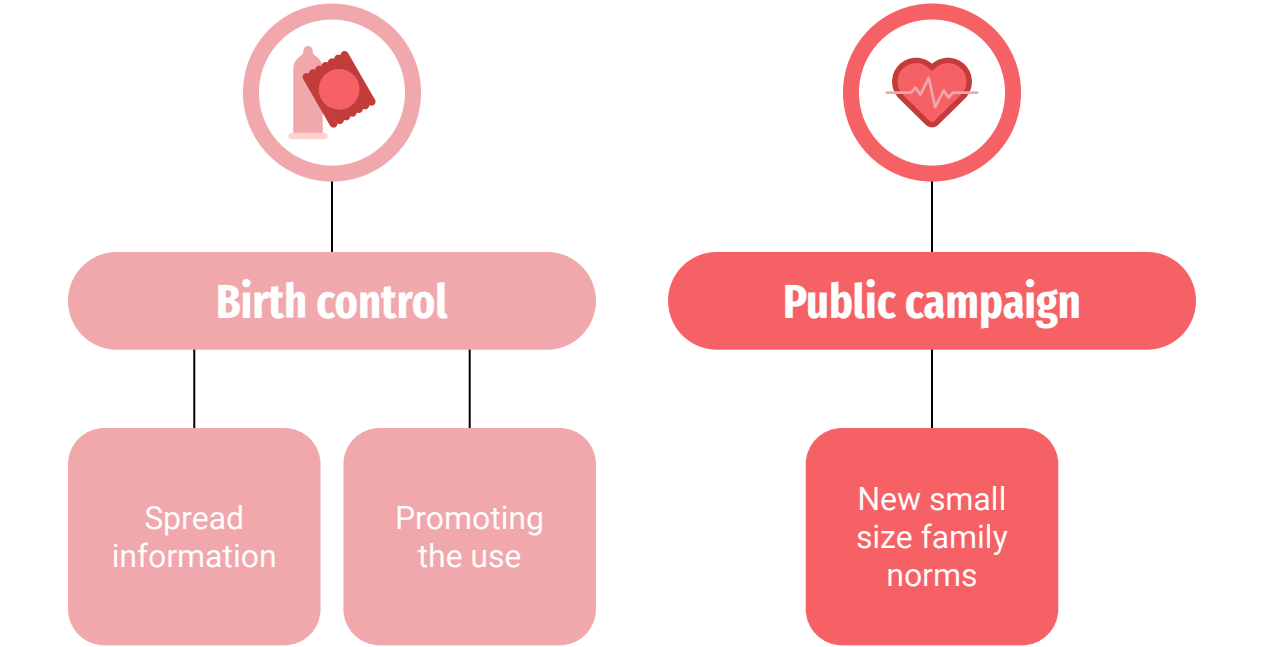
**US, Sweden, Other developed countries**

Support and enact policies to reduce the fertility rate

- Trend: Declining across countries and regions
- Socioeconomics: Plays a role in fertility decline
- Measures of family planning program: Find an association such as GDP, schooling, mortality rates, and urbanization

# Population control policies

## Have 2 main elements




Population control policies is the best for people

# Fertility patterns across time and space

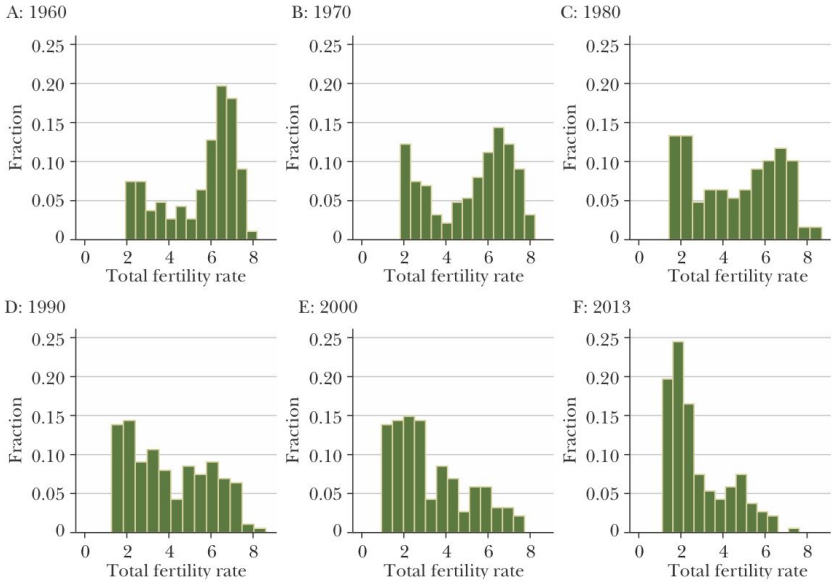
**1960**

Fertility rate between 6 to 8 with 6.2 median

**2013**

Fertility rate is 2 with 2.2 median

*Figure 1*
**Fertility Histograms over Time**



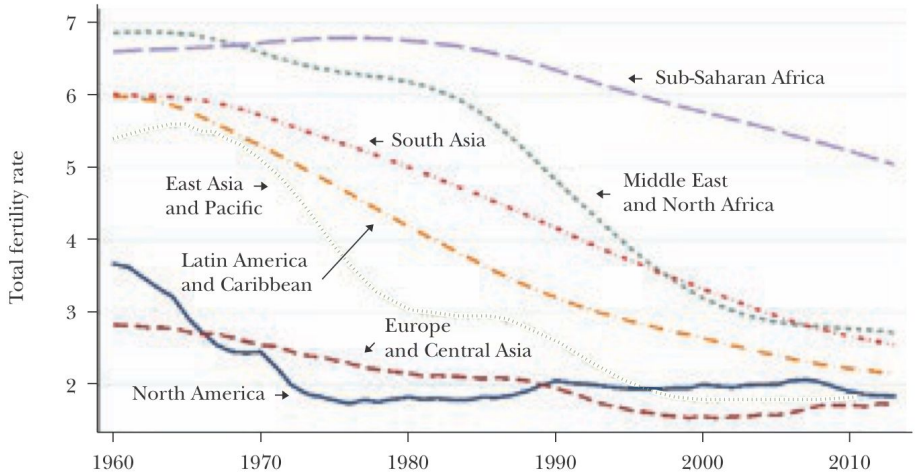

**Decline in fertility took place all over the world**

World's fertility rate decline from 5 children per women in 1960 to 2.5 children per women in 2013

# Fertility patterns across time and space

*Figure 2*

**Fertility Trends across Regions**



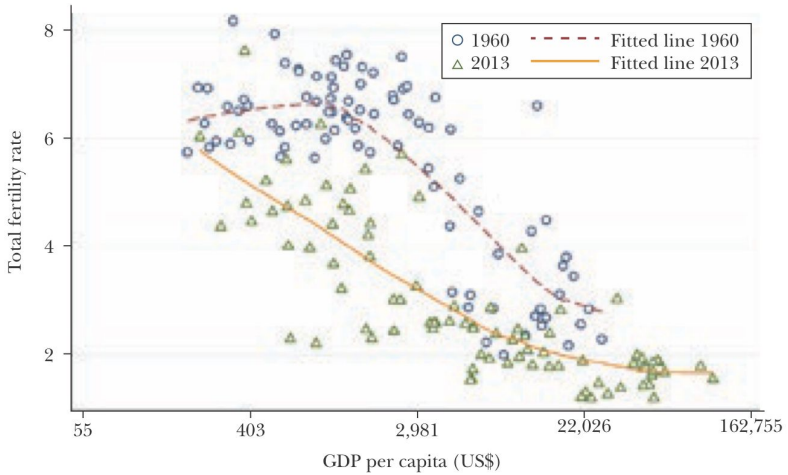

| Between 1960 - 2013 | |
|---|---|
| Latin America and Caribbean | 5.98 to 2.16 |
| East Asia and Pacific | 5.4 to 1.81 |
| Middle East and North Africa | 6.87 to 2.83 |
| South Asia | 6.02 to 2.56 |

# Fertility patterns across time and space

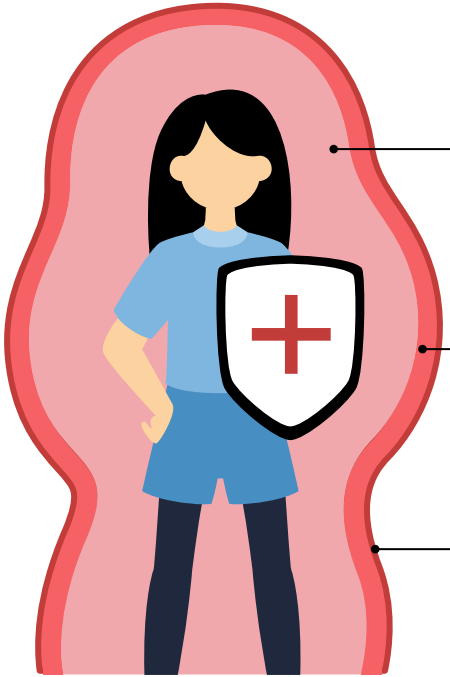
**There is a negative relationship between income and fertility rate.**

- Shifting downward and become flatter
- Indicates on average 2 children per women
- Explain why the fall in fertility rate is very rapid in developing countries in recent years

*Figure 3*
**Fertility–Income Relation in 1960 and 2013**



# The Global Family Planning Movement and its Consequences



1. Global Evolution of Family Planning Programs
2. Features of Family Planning Programs
3. Fertility Policies and the Decline in Fertility Rates

# 1. Global Evolution of Family Planning Programs

- After World War II, there was a big concern on imbalance between population and resource growth and the potential for political instability since the most population growth was concentrated in the poorest countries started by John D. Rockeller III.

- Rockefeller found Population Council
- India established the first National Population Program and International Planned Parenthood Federation.
- It was reported that the government of the United States must assist the countries that cooperate in economic aid programs

- First large-scale intervention was established by the Swedish government which aimed to support family planning efforts in Sri Lanka, India, and Pakistan. Then, other international organizations joined to provide funds around the world.
- In east asia, the programs tend to take more time than other developing countries due to culture and tradition for example the religious opposition towards birth control. Moreover, the problems include insufficient funding.

*Table 1*

**Number of Countries with Government Goals for Fertility Policy**

| *Year* | *Lower fertility* | *Maintain fertility* | *No intervention* | *Raise fertility* | *Number of Observations* |
|---|---|---|---|---|---|
| 1976 | 40 | 19 | 78 | 13 | 150 |
| 1986 | 54 | 16 | 75 | 19 | 164 |
| 1996 | 82 | 19 | 65 | 27 | 193 |
| 2005 | 78 | 31 | 47 | 38 | 194 |
| 2013 | 84 | 33 | 26 | 54 | 197 |

*Source:* The data is obtained from the UN World Population Policies database.
*Note:* The table shows the number of countries by type of policy adopted towards fertility. The data begins in 1976. Countries are categorized according to whether they had a policy to lower, maintain, or raise fertility or if they had no intervention to change fertility.

*Table 2*

**Number of Countries by Government Support for Family Planning**

| *Year* | *Direct support* | *Indirect support* | *No support* | *Limit/Not permitted* | *Number of Observations* |
|---|---|---|---|---|---|
| 1976 | 95 | 17 | 28 | 10 | 150 |
| 1986 | 117 | 22 | 18 | 7 | 164 |
| 1996 | 143 | 18 | 26 | 2 | 193 |
| 2005 | 143 | 35 | 15 | 1 | 194 |
| 2013 | 160 | 20 | 16 | 1 | 197 |

*Source:* The data is obtained from the UN World Population Policies database.
*Note:* The table shows the number of countries by the type of support extended by the state for family planning services. The data begins in 1976. Countries are categorized by whether their governments directly supported, indirectly supported, or did not support family planning as well as if the government limited family planning services or did not permit family planning in the country.

# 2. Features of Family Planning Programs

**Fact:**

- In most of developing countries, Family planning programs usually manage the birth control, for instants oral contraceptives, IUD, condoms, sterilization, and abortion. Moreover, it provides information on usage . Although the number of contraceptives used increases, it’s still not met with these fertility rates.

# 2. Features of Family Planning Programs

1

**link**

Linking family programs and health services together

2

**Mass communication**

Slogan on television, radio, magazines, posters, billboards

3

**Stronger inducement**

Using money and policy

# 2. Features of Family Planning Programs

**Additional point:**

- Besides increasing provided information and access to family planning methods, this also attempts to delay marriage and childbearing to control fertility.
- For example, in India the legal age of marriage was increased to 18 years for women and 21 years for men, and in Tunisiato 17 years for women and 20 years for men.
- China also imposed a minimum gap of three to four years between births and restricted the number of children to three per couple until it decided to implement the draconian one-child policy in 1979.
- However, family planning programs seem to have been incorporated into the broader framework of sexual and reproductive health services and become firmly entrenched in health care systems around the world.

# 3. Fertility Policies and the Decline in Fertility Rates

## HYPOTHESIS : Population control programs are the main factors contributing to the fertility decline

**3 measures to observe how the family planning program intensity is effectively implemented :**

1 **Funds for family planning**

- For **58 countries,** look at the amount of funds in each country available for family planning from the government & private sectors in the 1970s-1990s
- Latin American countries have the highest family planning funds provided by private sectors
- Asia family planning funds provided by the government estimated around 0.05-0.07 %

# Funds for family planning

Results of regression of change (with and without control) in fertility on average family planning funds in 1970s,1980s,and 1990s using **GDP per capita**, **educational attainment, urbanization**, and **infant mortality**

*Table 3*

**Change in Total Fertility Rates (TFRs) and Funding for Family Planning Programs**

| | *Dependent variable is: Change in TFR* | | | |
|---|---|---|---|---|
| | *Absolute change* | | *% Change* | |
| | (1) | (2) | (3) | (4) |
| ln(average funds per capita) | −0.630*** [0.120] | −0.430** [0.181] | −10.47*** [1.487] | −4.974** [2.030] |
| Change in years of education of adults | | −0.13 [0.133] | | 0.001 [0.002] |
| Change in urban population as % of total | | −0.008 [0.009] | | 0.001 [0.003] |
| Change in ln(GDP per capita) | | −0.426* [0.227] | | −0.382** [0.158] |
| Change in infant mortality rate | | 0.006* [0.003] | | 0.668*** [0.131] |
| Observations | 56 | 37 | 56 | 37 |
| $R^2$ | 0.35 | 0.39 | 0.418 | 0.72 |

- There is a **negative** relationship between change in total fertility rate and funds for family planning
- The more funding you have, the greater reduction in fertility rates will be seen in that country.
- Government spending has a **positive** correlation with the fertility decline whereas private spending does not seem to be significant

**Reminder** Female labor participation is excluded because there is no significant correlation between change in total fertility rate and female labor participation.

# HYPOTHESIS : Population control programs are the main factors contributing to the fertility decline

2 **Family planning program effort score**

- Observe in each country program effort and fertility changes(under the control factors) included East Asia, South Asia, Latin America, North America, Middle East, and Sub-Saharan Africa.
- A **strong negative** relationship on the countries with higher program effort
- Sub-Saharan Africa have a positive relationship due to its late policy adoption

*Table 4*

**Change in Total Fertility Rates (TFRs) and Family Planning Program Effort**

| | *Dependent variable is: Change in TFR* | | | |
|---|---|---|---|---|
| | *Absolute change* | | *% Change* | |
| | (1) | (2) | (3) | (4) |
| Average family planning program effort score | −0.039*** [0.007] | −0.041*** [0.014] | −0.716*** [0.101] | −0.500*** [0.166] |
| Change in years of education of adults | | −0.124 [0.115] | | 0.003 [0.003] |
| Change in urban population as % of total | | −0.012 [0.008] | | −0.0001 [0.005] |
| Change in ln(GDP per capita) | | 0.015 [0.198] | | −0.108 [0.192] |
| Change in infant mortality rate | | 0.002 [0.003] | | 0.549*** [0.142] |
| Observations | 107 | 55 | 107 | 55 |
| $R^2$ | 0.21 | 0.41 | 0.321 | 0.636 |

*** **95 countries** using policies, services, evaluation, and method access to measures the strength of a given country's program

# HYPOTHESIS : Population control programs are the main factors contributing to the fertility decline

3

**% of women exposed to family planning messages through mass media**

- **Negative** association between the fertility change and exposure to family planning messages after controlling other variables
- The late policy implementation in Sub-Saharan Africa leads to delayed decline in fertility in the region -> fertility rates still remain above the world's average

*Table 5*

**Change in Total Fertility Rates (TFRs) and Exposure to Family Planning Messages**

| | *Dependent variable is: Change in TFR* | | | |
|---|---|---|---|---|
| | *Absolute change* | | *% Change* | |
| | (1) | (2) | (3) | (4) |
| % of women with exposure to family planning messages on mass media | −0.038*** [0.007] | −0.050*** [0.011] | −0.602*** [0.090] | −0.449** [0.169] |
| Change in years of education of adults | | 0.054 [0.154] | | 0.001 [0.002] |
| Change in urban population as % of total | | −0.035** [0.016] | | −0.016 [0.010] |
| Change in ln(GDP per capita) | | −0.529** [0.244] | | −0.379* [0.197] |
| Change in infant mortality rate | | 0.002 [0.005] | | 0.551*** [0.175] |
| Observations | 57 | 30 | 57 | 30 |
| $R^2$ | 0.301 | 0.567 | 0.347 | 0.631 |

***This analysis is slightly different from the 1st and 2nd study because the data is mainly based on Sub-Saharan African countries

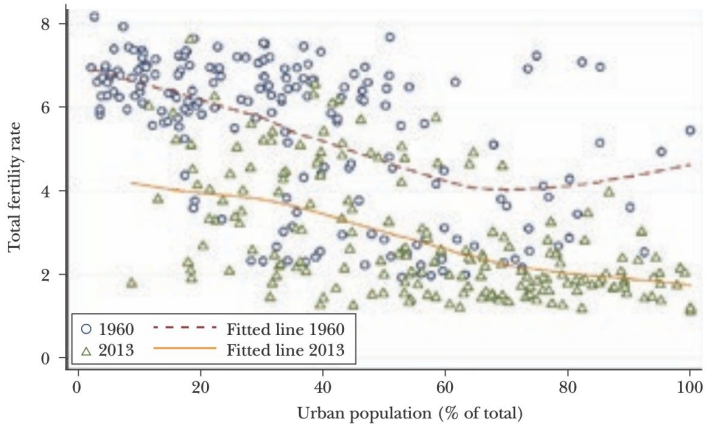
# Other explanations for the decline in fertility

**Socio-Economic factors are possible causes for the decline in fertility**

- Urbanization
- Education
- Female labor force participation
- Infant mortality rates

# Urbanization

*Figure 5*
**Fertility and Urbanization**




*Source:* Authors using data from the World Development Indicators database.
*Note:* For a sample of 190 countries, the figure shows the scatter plot and fitted line (smoothed lowess relationship, or locally weighted smoothing function) between fertility and urbanization in 1960 and 2013. Urbanization is measured as the proportion of the population living in urban areas.

- Rural areas have higher fertility rates than urban ones
- Even though parents can earn higher average wages in urban areas, it also costs more to raise children
- Farmers have a comparative advantage compared to people living in the city

The Graph shows a negative relationship between urbanization and fertility.
Although countries with less urbanization have higher fertility, it doesn't explain the sharp decline in fertility rates over the past 5 decades.

# Education

*Table 6*
**Fertility Change by Education in 2010**

| *Schooling in 2010* | *Absolute change in total fertility rate, 1960–2013* | *% change in total fertility rate, 1960–2013* | *Total fertility rate in 2010* |
|---|---|---|---|
| Years ≤ 3 | −1.35 | −19.12 | 5.87 |
| 3 < years ≤ 6 | −3.23 | −52.26 | 3.15 |
| 6 < years ≤ 9 | −4.09 | −67.23 | 2.04 |
| 9 < years ≤ 12 | −1.67 | −43.50 | 1.73 |
| Years > 12 | −1.51 | −45.22 | 1.81 |

*Source:* Authors. Data on fertility are from the World Development Indicators database and "years of schooling" comes from Barro and Lee (2013).
*Note:* The table presents the average absolute and percentage change in total fertility rate between 2013 and 1960 as well as average total fertility rate in 2010 by years-of-schooling groups. Years of schooling is grouped into five categories: years ≤ 3; 3 < years ≤ 6; 6 < years ≤ 9; 9 < years ≤ 12; and years > 12. "Years of schooling" is for the population aged 25+ in 2010 and covers 143 countries.

- Shift from the quantity of children towards higher quality of children shown through the increase in education level around the world.
- Strong negative relationship between fertility and education.
- Fertility rates are declining in the years of schooling of the population, all levels except the lowest education group results in a percentage decline in fertility.

The table shows the Average fertility rate in 2010 and fertility change (between 2013 and 1960) for countries grouped by the level of education of the adult population in 2010.

# Female labor force participation

- The cross-country correlation between female labor force participation and fertility shows a weak relationship
- There is high female labor force participation while the fertility rate remains low
- One possible reason is due to labor force participation rate did not change much over the past few decades so it doesn’t have a lot of effect on the fertility

# Infant Mortality

*Table 7*

**Changes in Wanted and Unwanted Fertility**

*(as a percentage of change in total fertility rate)*

| | *Overall* | *Urban* | *Rural* |
|---|---|---|---|
| **Change in *wanted* fertility rate** | 75.35% | 63.48% | 82.26% |
| Ideal number of children | 57.97% | 56.08% | 51.92% |
| Other | 17.38% | 7.41% | 30.35% |
| **Change in *unwanted* fertility rate** | 24.65% | 36.52% | 17.74% |

*Note and Source:* The table shows the change in wanted fertility rate and unwanted fertility rate (defined as the difference between total and wanted fertility rates) as a percentage of the change in total fertility rate using data from the Demographic and Health Surveys in 52 countries. The change in wanted fertility is further decomposed into the contribution of the change in the ideal number of children and a residual. Note that different countries were surveyed in different years and at different intervals—the earliest available survey is from 1986 while the latest is from 2015.

High correlation between changes in infant mortality and changes in fertility.

1. Fewer births are needed to ensure that a family's desired number of children survives to adulthood.
2. Decline in mortality rates and consequent population acceleration in the 1950s and 1960s triggered by the population control movement

The data indicates that the fall in wanted fertility accounts for a significant share of the fall in fertility, and that a large part of the fall in wanted fertility can be accounted for by the decline in the number of desired children.

# Conclusion

- The rapid decline in fertility rates in the past five decades is not good for economic growth, urbanization, education levels and other socio-economic variables.
- The decline in fertility links with the global population-control movement and policies aimed to lower fertility rates across the world.
- Global convergence in fertility rates will eventually ensure constant world population.
- Projections by the UN population division suggest that populations in all regions except for Africa will stabilize by 2050.
- The diffusion of contraception and the decline in fertility and postponement of childbearing could increase female empowerment in developing countries through higher levels of investment in human capital.

# Thank you

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