



# Scientific Reports

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RICHARD A. EASTERLIN  
EILEEN M. CRIMMINS

## **An Exploratory Study of the 'Synthesis Framework' of Fertility Determination with World Fertility Survey Data**

INTERNATIONAL STATISTICAL INSTITUTE  
Permanent Office, Director: E. Lunenberg  
428 Prinses Beatrixlaan, PO Box 950  
2270 AZ Voorburg  
Netherlands

WORLD FERTILITY SURVEY  
Project Director:  
Halvor Gille  
35-37 Grosvenor Gardens  
London SW1W 0BS, UK

The World Fertility Survey (WFS) is an international research programme whose purpose is to assess the current state of human fertility throughout the world. This is being done principally through promoting and supporting nationally representative, internationally comparable, and scientifically designed and conducted sample surveys of fertility behaviour in as many countries as possible.

The WFS is being undertaken, with the collaboration of the United Nations, by the International Statistical Institute in co-operation with the International Union for the Scientific Study of Population. Financial support is provided principally by the United Nations Fund for Population Activities and the United States Agency for International Development. Substantial support is also provided by the UK Overseas Development Administration.

For information on Country Reports, WFS publications, and WFS depository libraries, write to the Publications Office, International Statistical Institute, 428 Prinses Beatrixlaan, PO Box 950, 2270 AZ Voorburg, Netherlands. For information on the WFS generally, write to the Information Office, World Fertility Survey, International Statistical Institute, 35-37 Grosvenor Gardens, London SW1W 0BS, UK.

L'Enquête Mondiale sur la Fécondité (EMF) est un programme international de recherche dont le but est d'évaluer l'état actuel de la fécondité humaine dans le monde. Afin d'atteindre cet objectif, des enquêtes par sondage sur la fécondité sont mises en oeuvre et financées dans le plus grand nombre de pays possible. Ces études, élaborées et réalisées de façon scientifique, fournissent des données représentatives au niveau national et comparables au niveau international.

L'EMF est entreprise, en collaboration avec les Nations Unies, par l'Institut International de Statistique, qui coopère avec l'Union internationale pour l'étude scientifique de la population. Le financement de ce programme est essentiellement assuré par le Fonds des Nations Unies pour les activités en matière de population et par l'Agence des Etats-Unis pour le développement international. Une contribution importante est fournie par l'Agence pour le développement des pays d'outre-mer du Royaume-Uni.

Pour toute information concernant les rapports d'enquêtes nationales, les publications, le Bureau des publications, Institut International de Statistique, 428 Prinses Beatrixlaan, PO Box 950, 2270 AZ Voorburg, Pays-Bas. Pour tous renseignements complémentaires sur l'Enquête Mondiale sur la Fécondité, Institut International de Statistique, 35-37 Grosvenor Gardens, Londres SW1W 0BS, Royaume-Uni.

La Encuesta Mundial de Fecundidad (EMF) es un programa para determinar el estado actual de la fecundidad humana en el mundo financiando encuestas de fecundidad por muestreo en el mayor número y realizadas científicamente, nacionalmente representativas y comparables a nivel internacional.

El proyecto está a cargo del Instituto Internacional de Estadística y en cooperación con la Unión Internacional para el Estudio Científico de la Población. El financiamiento principal es proporcionado por el Fondo de las Naciones Unidas para la Actividad Demográfica y el Centro de Población de las Naciones Unidas. Una contribución importante es proporcionada por el Centro de Población y Desarrollo del Reino Unido.

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Members of the International Statistical Institute,  
World Fertility Survey and the Panel on Fertility Determination,  
Committee on Population and Demography of the  
Research Council, National Academy of Sciences  
United States of America

**RICHARD A. EASTERLIN**

**EILEEN M. CRIMMINS**

University of Southern California

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## Appendix A – Definitions of Variables

**Table A1** Definition and measurement of first-stage variables in tables 1, 2, 3 and 4

Variable	Country	WFS variable	Definition and measurement
Children ever born	Sri Lanka	V208	Number of children ever born.
	Colombia	V208	Same as Sri Lanka.
Regulators, non-regulators	Sri Lanka	V634 S021	Reported ever-use of any method of contraception or abortion, 1 = yes (regulators); 0 = no (non-regulators).
	Colombia	V634 V204	Same as Sri Lanka.
Years since first use of fertility control	Sri Lanka	S006 S009 S013 S017 S023 V009 V010 S007	If first method ever used was pill, IUD, condom or sterilization, the age at first use is given by differencing year at first use of method and year of birth. If another method of fertility control was the first method ever used, age at first use is the mother's age at the birth of the child after which she first used family planning plus two years. If the woman used fertility control before any children were born, her age at first use is her age at marriage. The difference between current age and the age at first use is the years since first use of fertility control.
	Colombia	S215 S222 V009 S216 V010 V204	If first method ever-used was sterilization, age at sterilization is the age at first use. If another method was the first method used, the age of the mother at the birth of the child after which she first used plus one year is the age at first use. If the woman used fertility control before any children were born, her age at first use is her age at marriage. Years since first use is the difference between current age and the age at first use. For women who have used only abortion as a method of fertility control, years of use is calculated as .667 per abortion.
Duration of marriage	Sri Lanka	V010 V109	The difference between current age and age at first marriage.
	Colombia	Ditto	Same as Sri Lanka.
First birth interval	Sri Lanka	V228	First birth interval in months. The mean first birth interval for regulators who did not regulate until after the first birth is substituted for the observed first birth interval of those who regulated before the first birth.
	Colombia	V228	Same as Sri Lanka.
Second birth interval	Sri Lanka	B022 B012	The difference in months between the date of birth of the second child and the date of birth of the first child. The mean second birth interval for regulators who did not regulate until after the second birth is substituted for the observed second birth interval of those who regulated before the second birth.
	Colombia	Ditto	Same as Sri Lanka.

**Table A1** *Continued*

Variable	Country	WFS variable	Definition and measurement
Length of breastfeeding	Sri Lanka	V302	Number of months breastfed in last closed birth interval.
	Colombia	V302	Same as Sri Lanka.
Not secondarily sterile	Sri Lanka	V206 V402 V637 V225	Two-category variable: 1 = fecund; 0 = sterile. If currently pregnant, respondent is fecund. If respondent reports fertility impairment, respondent is sterile. If respondent is not a current user of contraception and reports no birth in the past five years, respondent is sterile.
	Colombia	Ditto	Same as Sri Lanka.
Proportion of pregnancy wastage	Sri Lanka	V201 V208	Number of wasted pregnancies divided by the sum of the number of wasted pregnancies plus the number of live births.
	Colombia	V201 V204 V208	The difference between the number of wasted pregnancies and the number of induced abortions divided by the sum of the number of wasted pregnancies plus the number of live births minus the number of induced abortions.
Proportion of child mortality	Sri Lanka	V213 V208	The difference between the number of children ever born and the number currently living, divided by the number of children ever born.
	Colombia	Ditto	Same as Sri Lanka.



**Table A2** Definition and measurement of costs of regulation and motivation variables in tables 5, 6, 7, 8, 9 and 10

Variable	Country	WFS variable	Definition and measurement
<i>RC: Costs of fertility regulation variables</i>			
Number of methods known	Sri Lanka	V601 V602 V603 V604 V605 V606 V607 V608 V609 V610 V611 V615	The number of methods of fertility control known to the respondent and reported without special prompting. Sum of '1' responses on variables listed.
	Colombia	Ditto	Same as Sri Lanka.
Efficiency of methods known	Sri Lanka	V616	Categorical variable: 1 = no method of contraception known; 2 = only inefficient method of contraception known; 3 = efficient method of contraception known.
	Colombia	V616	Same as Sri Lanka.
Knowledge of and approval of abortion	Sri Lanka	S021	Knowledge of abortion: 1 = heard of; 0 = never heard of.
	Colombia	S107	The number of situations (out of total of six) in which abortion is considered acceptable.
Distance to nearest family planning outlet	Sri Lanka	—	Not applicable.
	Colombia	S203	Number of kilometers to nearest family planning outlet.
Travel time to nearest family planning outlet	Sri Lanka	—	Not applicable.
	Colombia	S205	Number of minutes' travel to nearest family planning outlet.
<i>Motivation variables</i>			
Cn Potential surviving children	Sri Lanka	—	$(N \times s)$ , where N is determined by equation in table 2; and s is $(1 - \text{the proportion of child mortality})$ .
	Colombia	—	Same as Sri Lanka.
Cd Number of children desired	Sri Lanka	V511	Answer to question, 'If you could choose exactly the number of children to have in your whole life, how many would that be?'
	Colombia	V511	Same as Sri Lanka.
C Number of living children	Sri Lanka	V213	Reported number of living children.
	Colombia	V213	Same as Sri Lanka.
Wants no more	Sri Lanka	V502	If respondent is fecund and wants no more children, wants no more = 1; if respondent is not fecund or wants more children = 0.
	Colombia	V502	Same as Sri Lanka.

**Table A3** Definition and measurement of modernization and cultural variables in tables 11, 12, 13 and 14

Variable	Country	WFS variable	Definition and measurement
<i>Modernization variables</i>			
Wife's education	Sri Lanka	S029	Number of single years of education.
	Colombia	V704	Same as Sri Lanka.
Residence	Sri Lanka	V702	Place of usual residence, 1 = rural; 0 = urban, estate.
	Colombia	V702	Place of usual residence, 1 = rural; 0 = urban.
Husband's occupation	Sri Lanka	V804	Dummy variable with categories: farmers (self-employed), agricultural workers (non self-employed), unskilled workers and labourers; omitted category includes white collar workers (professional, clerical, sales), skilled craftsmen, and service workers (private household and other service and related workers).
	Colombia	V804	Dummy variable with categories: farmers (self-employed), agricultural workers (non self-employed), service workers (not including private household workers); omitted category includes white collar workers (professional, clerical, sales), skilled craftsmen, private household workers and unskilled labourers.
Wife's work status before marriage	Sri Lanka	V708	Dummy variable with categories: farm worker (either self-employed or non self-employed), non-farm worker (worked in non-farm occupation); omitted category is no work before marriage.
	Colombia	V708	Same as Sri Lanka.
<i>Cultural variables</i>			
Ethnicity	Sri Lanka	V707	Dummy variable with categories: Sri Lanka Tamil, Indian Tamil, Sri Lanka Moor; omitted category is Sinhalese plus others.
	Colombia	—	Not applicable.
Region	Sri Lanka	—	Not applicable.
	Colombia	V701	Dummy variable with categories: Atlantic, Oriental, Central, Bogotá; omitted category is Pacific.

## Appendix B – The National Research Council

The National Research Council was established by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the Federal Government. The Council operates in accordance with general policies determined by the Academy under the authority of its Congressional charter of 1863, which establishes the Academy as a private non-profit-making, self-governing membership corporation. The Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in the conduct of their services to the government, the public and the scientific and engineering communities. It is administered jointly by both Academies and the Institute of Medicine. The National Academy of Engineering and the Institute of Medicine were established in 1964 and 1970 respectively, under the charter of the National Academy of Sciences.

### PANEL ON FERTILITY DETERMINANTS

**W. Parker Mauldin** (Chair), The Rockefeller Foundation, New York  
**Elza Berquó**, Centro Brasileiro de Análise e Planejamento, São Paulo, Brazil  
**William Brass**, Centre for Population Studies, London School of Hygiene and Tropical Medicine  
**David R. Brillinger**, Department of Statistics, University of California, Berkeley  
**V. C. Chidambaram**, World Fertility Survey, London  
**Julie Davanzo**, Rand Corporation, Santa Monica  
**Richard A. Easterlin**, Department of Economics, University of Southern California  
**James T. Fawcett**, East-West Population Institute, East-West Center, Honolulu  
**Ronald Freedman**, Population Studies Center, University of Michigan  
**David Goldberg**, Population Studies Center, University of Michigan

**Ronald Gray**, School of Hygiene and Public Health, Johns Hopkins University, Baltimore  
**Paula E. Hollerbach**, Center for Policy Studies, The Population Council, New York  
**Ronald Lee**, Graduate Group in Demography, University of California, Berkeley  
**Robert A. Levine**, Graduate School of Education, Harvard University  
**Susan C. M. Scrimshaw**, School of Public Health, University of California, Los Angeles  
**Robert Willis**, Department of Economics, State University of New York, Stony Brook

Robert J. Lapham, Study Director  
Rodolfo A. Bulatao, Senior Research Associate

### COMMITTEE ON POPULATION AND DEMOGRAPHY

**Ansley J. Coale** (Chair)  
**William Brass**  
**Lee-Jay Cho**  
**Ronald Freedman**  
**Nathan Keyfitz**  
**Leslie Kish**  
**W. Parker Mauldin**  
**Jane Menken**  
**Samuel Preston**  
**William Seltzer**  
**Conrad Taeuber**  
**Etienne van de Walle**

Robert J. Lapham, Study Director

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