

State-of-the-Art
Family Planning
& Reproductive
Health Services



CATALYST
consortium

2nd Champions Meeting on BIRTH SPACING

The CATALYST Consortium

May 2, 2002





CATALYST
consortium

**The Birth Spacing Initiative Program is an activity of the
CATALYST Consortium, dedicated to expanding knowledge of
optimal birth spacing choices on a global level.**

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C. List of Participants

I. List of Acronyms

CA	USAID Cooperating Agency
CLAP	Center for Perinatology and Human Development, Division of Health Promotion and Protection, Pan American Health Organization, World Health Organization, Montevideo, Uruguay
DFID	Department For International Development (U.K.)
DHS	Demographic and Health Survey
IPPF	International Planned Parenthood Federation
LAM	Lactational Amenorrhea Method
NGO	Non-Governmental Organizations
PAC	Postabortion Care
PAHO	Pan-American Health Organization
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

II. Executive Summary

The second meeting of the Optimal Birth Spacing Interval Program brought together over 40 Birth Spacing Champions and interested health professionals from 22 organizations to discuss new research findings on the strong association between birth intervals of three to five years and improved maternal and child health outcomes.

For the May 2002 Birth Spacing meeting, the CATALYST Consortium brought three foremost researchers to present evidence-based scientific data that supports a recommendation for birth intervals of three to five years.

The research presented at the Champions meeting provides evidence for an Optimal Birth Spacing Interval. The data presented by Shea Rutstein and Agustín Conde-Agudelo indicated that risks for adverse outcomes fall to the lowest point at three to five years and then rise and, in some cases, reach or exceed the risks associated with the shortest intervals. Shea Rutstein's analysis shows that birth intervals of 36-47 months (3.0-3.9 years) have the lowest associated perinatal, neonatal, infant and child mortality. Dr. Conde-Agudelo's analysis on maternal outcomes shows that a birth interval of less than 15 months (1.25 years) and greater than 68 months (5.67 years) is associated with an increased risk of adverse maternal outcomes. Dr. Conde-Agudelo's analysis of perinatal outcomes shows that a birth interval of less than 15 months (1.25 years) and greater than 68 months (5.67 years) is associated with an increased risk for low birth weight, pre-term birth, small for gestational age and neonatal death. Dr. Conde-Agudelo concluded that the lowest risks for maternal and perinatal outcomes occur when births are spaced close to three years.

Translating the research into tangible human outcomes, Conde-Agudelo estimated that if families chose to space births for two to three years, perinatal mortality would drop 14.1% and total perinatal deaths would fall by 60,500 annually in Latin America.

One of the key outcomes of this meeting was a new name for the venture. After a survey of the meeting participants and the CATALYST staff, it was decided that the Initiative will be called the Optimal Birth Spacing Interval Program (the OBSI Program). The purpose of the OBSI Program is to help individuals achieve optimal birth intervals for improved maternal and infant health. CATALYST and the Birth Spacing Champions will promote new guidance on birth spacing for three to five years. Participants in the May meeting agreed that the OBSI Program should support informed choice and quality of care by adopting a comprehensive, multi-sectoral approach.

Based on recommendations from the Birth Spacing Champions who attended the January meeting, CATALYST developed a proposed three-pronged strategy for a global Optimal Birth Spacing Interval Program. The overall goal of the OBSI Program is to reduce infant, child and maternal morbidity and mortality by increasing birth intervals. The three key objectives of the OBSI Program are: Creating Consensus; Strengthening Programs; and Reaching Clients. Working groups were formed to address the three components of the strategy. Participants chose to join one of the three working groups and developed action plans for the coming year's activities.

Optimal Birth Spacing Interval Program Second Champions Meeting May 2, 2002

III. Objectives of the Meeting

The second Champions meeting for the Optimal Birth Spacing Interval Program (the OBSI Program) brought together over 40 Birth Spacing Champions and interested health professionals from 22 organizations to discuss new research findings on the strong association between birth intervals of three to five years and improved maternal and child health outcomes. The Working Groups also began to develop a plan of action to move the OBSI Program from research to action. The objectives of the meeting were:

- * To present new research undertaken since the January meeting.
- * To discuss CATALYST's proposed strategy for the Optimal Birth Spacing Interval Program.
- * To develop action plans for the Champions Working Groups, including responsibilities and implementation schedules.

IV. Background for Additional Research

At the January 31, 2002 Birth Spacing Champions meeting, participants identified issues requiring additional study, the most poignant of which were: What is the optimal timing of the first birth and then of subsequent births?; How much greater are the health benefits of the 36-month interval than the 24-month interval? What are providers currently telling clients about spacing and; What is the anticipated public health impact of reduced infant mortality if the currently unmet need for spacing were met? For the May 2002 Birth Spacing meeting, CATALYST brought together three foremost researchers – Agustín Conde-Agudelo, MD; Shea Rutstein, PhD; and William Jansen, PhD – to present evidence-based scientific data that supports a recommendation for birth intervals of three to five years.

CATALYST invited Dr. Agustín Conde-Agudelo to run additional analyses using the same database used for his previous studies on the association between perinatal-maternal health and interpregnancy intervals. The additional analyses aimed to produce information on: 1) the association between maternal-perinatal morbidity and mortality and interpregnancy intervals; and 2) the association between interpregnancy intervals and previous pregnancies that ended in live births or abortion among adolescents.

Shea Rutstein, PhD presented new findings on birth spacing using Demographic and Health Survey (DHS) data from 25 surveys in 18 countries in Africa, Latin America/Caribbean and Asia/Near East regions. Rutstein analyzed the relationship between birth intervals and perinatal mortality, looking at miscarriages, early neonatal and perinatal mortality and stillbirth mortality at differing birth intervals.

William Jansen, PhD presented recent research on demand for birth spacing. Jansen analyzed DHS data from 15 developing countries in Africa, Latin America and Asia/Near

East and found that young and low parity women represent the highest portion of demand for birth spacing.

Since the January 2002 meeting, CATALYST has organized focus groups in Peru, Bolivia, India, and Egypt with the purpose of gathering qualitative data in order to better understand the individual, cultural, institutional (service) and structural influences on birth spacing behaviors. In particular, CATALYST will investigate the role of the health care provider in birth spacing counseling and service provision.

V. New Research on Birth Spacing

Dr. Agustín Conde-Agudelo is the Director of the Department of Obstetrics and Gynecology, Clinical Foundation Valle del Lili in Cali, Colombia. He is also a consultant to CLAP/PAHO/WHO. Dr. Conde-Agudelo conducted research on the association of birth intervals and maternal and perinatal morbidity and mortality, controlling for country of residence and 16 other potentially confounding variables. He analyzed a database of over 450,000 parous women delivering singleton infants from Latin America between 1985-1997, also utilized for his previous research (Conde-Agudelo and Belizan: 2000).

Conde-Agudelo reported on the relationship between interpregnancy interval and adverse **perinatal** outcomes using a dataset of over one million women in Latin America. He found that short (<15 months) and long (>68 months) birth intervals are associated with adverse perinatal outcomes including low birth weight, pre-term delivery, small for gestational age, fetal death and neonatal death.

Conde-Agudelo analyzed **maternal** morbidity and mortality associated with various interpregnancy intervals using a dataset of over 456,000 women. He found that interpregnancy intervals of less than 15 months and greater than 68 months are associated with increased risks of adverse

Interpregnancy interval is a measure of the time between the last delivery and the date of the last menstrual period for the index pregnancy (birth to conception).

Birth interval is a measure of the time between consecutive births (interpregnancy interval + 9 months).

maternal outcomes, including maternal death, third trimester bleeding, preeclampsia, and premature rupture of membranes.

Conde-Agudelo also studied maternal and perinatal mortality and morbidity associated with **adolescent** pregnancy. The study sample of over 344,000 pregnant adolescents (aged 10 to 19) represented 20% of all pregnancies in the Latin American database. The control group was a sample of over 500,000 women age 20 to 24 year old. The study found that adolescent pregnancy is independently associated with increased risk of adverse maternal and perinatal outcomes, including maternal death, pre-eclampsia, anemia, episiotomy, low birth weight, pre-term delivery and small for gestational age. The risks are greatest for women under age 15, who have over four times the risk of maternal death and eclampsia as women in the control group.

Dr. Conde-Agudelo also analyzed the effect of a previous pregnancy ending in abortion (both spontaneous and induced) on birth intervals among adolescents. Results indicate that birth intervals of adolescents whose previous pregnancy ended in an abortion were

likely to be shorter than a birth interval following a live birth. The data show that following a previous abortion, 40% of adolescents under age 15 had a birth interval of <15 months and 85% <25 months. The analysis indicates that adolescent pregnancy is independently associated with increased risks of adverse maternal and perinatal outcomes, and that the risks are most striking among the youngest women.

Dr. Conde-Agudelo's analyses controlled for **16 confounding variables**: maternal age; number of previous deliveries; history of abortion; stillbirth and early neonatal death; previous caesarean delivery, marital status; education; cigarette smoking; body mass index before pregnancy; trimester during which prenatal care was started; number of prenatal care visits; geographic area; hospital type; and year of delivery.

Dr. Conde-Agudelo's full report is included in this document as Appendix B.

Shea Rutstein, PhD, is the Technical Director of MACRO International and a consultant to USAID. Rutstein presented new findings using DHS data from 25 surveys in 18 countries in Africa, Latin America/Caribbean and Asia/Near East regions. The analysis controlled for mother's age at pregnancy; mother's parity at pregnancy; result of previous pregnancy (where known); mother's education; urban-rural residence; and country.

Rutstein's study found that the fewest miscarriages occurred at 24-35 month birth intervals; the lowest perinatal mortality at 36-47 month birth intervals; the lowest early neonatal and perinatal mortality at 36-47 month birth intervals; and the lowest stillbirth mortality at 36-47 month birth intervals.

Shea Rutstein's full report is included in this document as Appendix B.

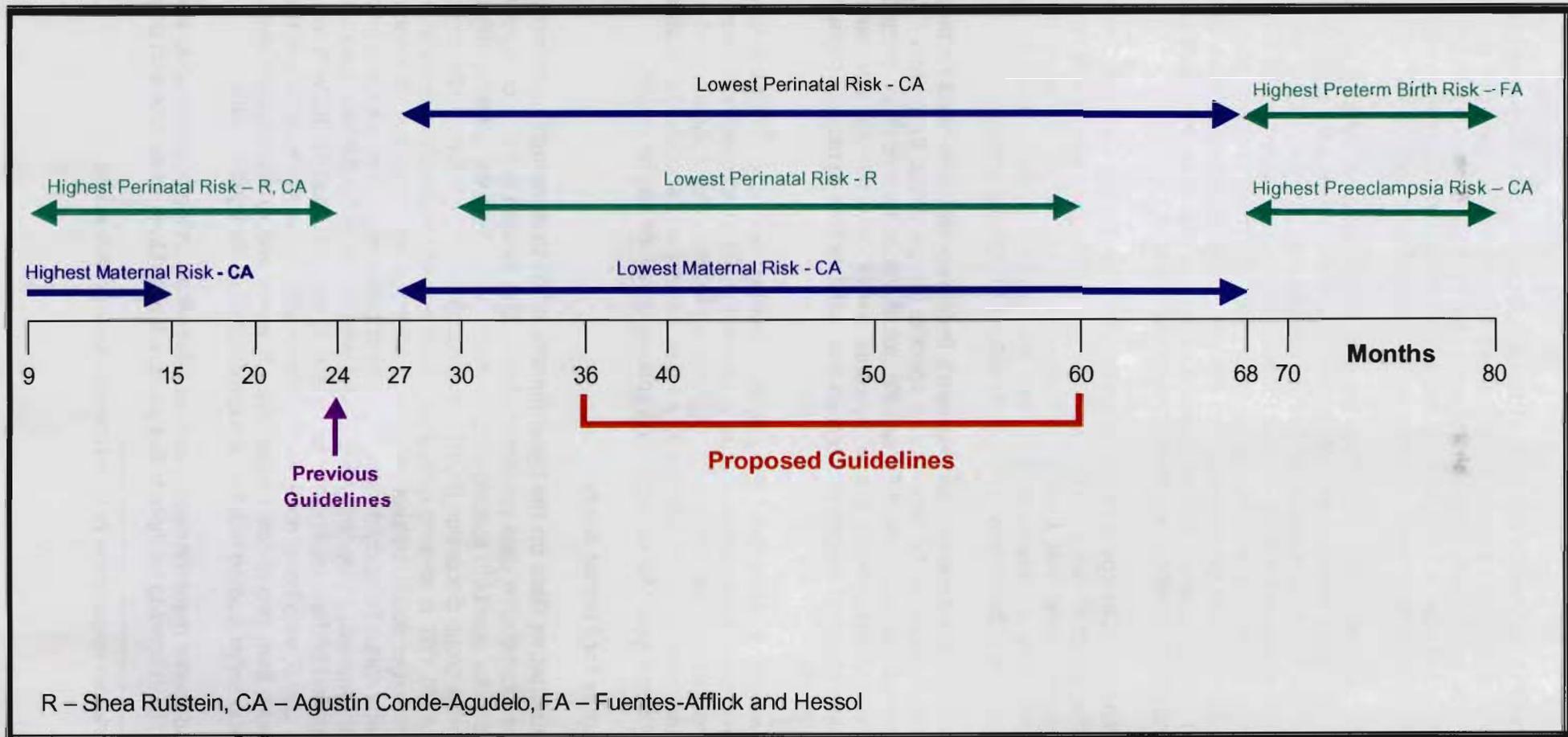
William Jansen, PhD, is the Director of the PRIME II/INTRAH Project and Professor of Social Medicine at the University of North Carolina School of Medicine. Jansen et al. analyzed DHS data from 15 developing countries in Africa, Latin America/Caribbean, and Asia Near East. William Jansen presented new evidence on the demand for birth spacing among young and low-parity women. Particularly interesting is the finding that the demand for birth spacing exists among zero-parity women, providing evidence that women in some developing countries are interested in delaying their first births.

Results of the analysis prompted Jansen et al. to develop a composite description of a "typical birth spacer", who would be likely be: a married woman under 30 years of age with fewer than three children, if she is identified as having an unmet need for family planning.

William Jansen's full report is included in this document as Appendix B.

VI. Major Findings and Key Outcomes

Definition of Optimal Birth Interval: At CATALYST's January meeting, participants were concerned about the definition of "optimal" birth interval. After the research presentations on the strong association between lengthened birth intervals and improved health outcomes, participants at the May Champions meeting discussed the need to define the optimal birth spacing interval. It was agreed that the optimal birth spacing interval would be the period associated with the most favorable health outcomes for **mothers and children**. The champions recommended that WHO be involved in adopting and promoting three-to-five-year birth intervals as the new guideline. Based on the new research findings, CATALYST and Dr. Conde-Agudelo crafted Figure 1 to illustrate the new proposed guidelines for the optimal birth spacing interval.



The Public Health Benefits of Birth Spacing: Conde-Agudelo has estimated that if families chose to space births for two to three years, perinatal mortality would drop 14.1% and total perinatal deaths would fall by 60,500 annually in Latin America. (Total births per year in Latin America average 11 million. The perinatal mortality rate is 39 per 1,000 live births. Annual perinatal deaths currently total 429,000).

The purpose of the OBSI Program is to help individuals achieve optimal birth intervals for improved maternal and infant health. CATALYST and the Birth Spacing Champions will support new guidance on birth spacing of three to five years. Participants in the May meeting agreed that the Interval Program should support informed choice and quality of care. It was also agreed that the OBSI Program should not be a stand-alone activity, but instead should be integrated into existing reproductive health/family planning and child survival programs. Special attention should be placed on the client-provider interaction and efforts to reach individuals through mass media.

Behavior Change and Communication: The Target Groups: In light of Jansen's data, which shows an unmet demand for birth spacing among low parity women, it has become clear that optimal birth spacing is a crucial message for young people, particularly adolescents, zero and low parity women. There is also a need to understand better how to deliver messages to high-risk groups.

Both Conde-Agudelo's and Rutstein's findings point to the need for targeted information and services to be provided to specific groups about their risks. Conde-Agudelo's findings suggest a need for specific guidelines and services for pregnant adolescents. The findings indicate that adolescents are at great risk for adverse health outcomes related to short pregnancy intervals and that they tend to repeat pregnancies within short intervals.

Designing Effective Programs: Development and implementation of effective programs that translate this new information into improved outcomes for women and children will require a multi-sectoral approach. Public health and behavior change strategies are most effective when they involve and educate communities and families, whose support for women's birth spacing decisions can be critical.

Areas for Further Study

Qualitative Data on the Determinants of Birth Spacing Behaviors: To compliment the quantitative data presented above, and to form a more comprehensive research base for new birth spacing programming, CATALYST will gather qualitative data through focus group discussion (FGD) in five countries: Peru, Bolivia, India, Egypt and Pakistan¹. CATALYST is seeking qualitative, social science research in order to better understand the larger social, cultural, religious, institutional and structural influences on birth spacing behaviors. To study the determinants of birth spacing behavior, the following groups will be targeted: 1) women (aged 17-30) with two or more children aged under 5, who have spaced births a minimum of two years; 2) women (aged 17-30) with two or more children under 5, who have *not* spaced births in any systematic way; 3) men (aged 17-35) with more than two children aged under 5 years; and 4) reproductive health care providers who serve women with two or more children under aged 5 years.

Additional research needs, such as information on the potential socio-economic benefits of birth spacing for three to five years, will be addressed as research gaps are identified.

¹ Pakistan was added after the Second Champions Meeting on Birth Spacing

Non-Medical Factors and Non-Health Benefits of Spacing: Not only physiological/medical rationales but also sociological and behavioral factors influence the acceptance of birth spacing. To address this, participants called for research on the cultural, economic and social dynamics which shape birth spacing behaviors. Subjects for further study would be the other-than-health benefits of birth spacing, including economic and quality of life benefits.

Global Implications of the New Research

Data on the health benefits of birth spacing for three years or longer is relevant to both developing and developed countries. Additional review undertaken by CATALYST identified studies that support the new research findings. Several studies from the United States comparing ethnic and racial minority groups with non-minority groups confirm the benefits of birth spacing for three years (Zhu et al:1999, Zhu et al: 2001, Fuentes-Affleck and Hessel: 2000). Research from Latin America/Caribbean (Conde-Agudelo: 2000 and 2002), research from Africa, Latin America/Caribbean, and Asia Near East, as well as research from the United States consistently indicate that there is an optimal birth interval for perinatal, neonatal, child and maternal health.

VII. A Proposed Strategy for Translating Research into Action

Based on recommendations from the birth spacing champions who attended the January meeting, CATALYST developed a proposed three-pronged strategy for an Optimal Birth Spacing Interval Program. The overall goal of the OBSI Program is to reduce infant, child and maternal morbidity and mortality by increasing birth intervals. The three key objectives are:

- 1) Creating Consensus
- 2) Strengthening Programs
- 3) Reaching Clients

1) Creating Consensus: International organizations are responsible for setting the norms for FP/RH, child survival and reproductive health programs. International organizations and program managers should be encouraged to understand and accept the strong association of two-to-three year birth intervals with infant/child/maternal mortality and morbidity reduction.

Objectives

- ◆ Create awareness among public health agencies
- ◆ Support governments in adopting 3 to 5 year birth interval as the optimal birth interval
- ◆ Develop protocols and guidelines on optimal birth spacing practices

Strategy

- ◆ Create awareness
 - Define a public health guidelines of three-to-five year birth intervals
 - Create partnerships with international and multilateral agencies
 - Disseminate knowledge
 - Hold conferences and technical exchanges
 - Publish technical papers
- ◆ Support governments in adopting the new OBS guidelines
 - Hold national conferences
 - Support advocacy groups
 - Develop guidelines for public, NGO and private sectors

- 2) **Strengthening Programs:** Governments should be encouraged to adopt OBSI guidelines and to reach the greatest number of people through public, commercial and NGO sectors. Champions need to work with medical and non-medical channels, community outreach and non-traditional providers to strengthen health services and community programs with birth spacing programming.

Objectives

- ◆ Integrate birth spacing programming into public, private and NGO health program
- ◆ Create birth spacing oriented services
- ◆ Undertake provider training at all levels
- ◆ Involve the community
- ◆ Measure results

Strategy

- ◆ Involve the community in integrating optimal birth spacing messages into existing programs
- ◆ Disseminate optimal birth spacing guidelines
- ◆ Train public, private and NGO service providers
- ◆ Develop indicators to measure process and outcome performance
- ◆ Disseminate optimal birth spacing messages among community leaders
- ◆ Develop accreditation systems for birth spacing programming

- 3) **Reaching the Clients:** In order for morbidity/mortality to be reduced, women and men must make the decision to space births for three to five years using appropriate methods of their choice. Quality of service, personal beliefs (religious and other), social norms and lack of knowledge are major determinants of birth spacing behavior. The goal is to integrate the behavioral factors contributing to the adoption of birth spacing into reproductive health and family planning programs.

Objectives

- ◆ Define client knowledge, beliefs and actions regarding birth spacing
- ◆ Determine the optimal client-provider interaction to ensure informed client-decision making about birth spacing
- ◆ Determine optimal counseling behavior messages to ensure informed client decision making about birth spacing
- ◆ Produce a prototype counseling module on birth spacing

Strategy

- ◆ Use qualitative methods to determine knowledge, beliefs and actions regarding birth spacing
- ◆ Through these studies, define key client-provider behaviors to concentrate on for interventions to adopt birth spacing behaviors
- ◆ Create program guide prototype to be used by personnel engaged in counseling
- ◆ Produce a training counseling guide
- ◆ Produce package of supporting counseling materials
- ◆ Monitor application of counseling
- ◆ Document and disseminate successful interventions among all partners

VIII. Working Groups and Action Plans

Working groups were formed to address the three components of the strategy: defining norms/creating awareness; strengthening health service delivery with birth spacing programs; and reaching clients. Participants joined one of three working groups in the area of activity their organizations are able to make the greatest contribution. These groups developed preliminary action plans for the coming year's activities, as reported below.

Creating Consensus

Leader: Isabel Stout

Champions: Vicki Baird, Bill Jansen, Maureen Norton, Jim Shelton, Vidya Setty

Activity	Name, Organization
Place the OBSI Program agenda in WHO Best Practices Consortium	J. Shelton, USAID
Application for Bellagio Meeting (Summer 2003)	J. Shelton, USAID
Address programming barriers: What are they? How can they be addressed? Study health and non-health (policy) barriers	B. Jansen, PRIME V. Setty, JHUCCP
Work with Professional Associations Providers & Pharmaceutical Industry	V. Baird, Meridian Group
Donors UNICEF UNFPA PAHO World Bank WHO Pharmaceuticals Others: DFID, Gates (not only multilaterals)	M. Labbock M. Norton, USAID CATALYST M. Norton, USAID J. Shelton, USAID V. Baird, Meridian Group CATALYST
Support Services/Distribute information List Serves, Action Plans, Strategy	CATALYST and others

Key next steps for the Working Group include:

- Developing collaborations with UNICEF and WHO
- Preparing application for Rockefeller Foundation support for a high-level meeting at Bellagio
- Developing collaborations with other donors and the pharmaceutical industry

Strengthening Programs/Integrating Birth Spacing	
Leader: Annette Bongiovanni Champions: Sam Clark, Cathy Solter, Marcia Townsend, Ron Magarick, John Pile, John Coury	
Activity	Name, Organization
Reach outside PHN to Child Survival and other health programs	J. Coury, USAID
Link with emergency contraception strategy	CATALYST
Draft national service delivery guidelines	R. Magarick, JHPIEGO C. Solter, Pathfinder J. Pile, EngenderHealth
Design suggested package inserts for contraceptives	S. Clark, PATH
Present to Maximizing Access and Quality (MAQ)	USAID/JHPIEGO
Develop/design training materials	All CAs
Mainstream LAM	A. Bongiovanni, Linkages/AED
Design prototype pamphlet	USAID/CATALYST
Coordinate with adolescent programming	S. Clark, PATH C. Solter, Pathfinder
Integrate with PAC	PAC CAs
Draft SOTA for HPN officers	M. Norton, USAID
Identify priority countries with high unmet need	S. Rutstein, MACRO B. Jansen, PRIME

Key next steps for the Strengthening Programs/ Integrating OBS Working Group include:

- Identifying priority countries
- Drafting national service delivery guidelines and training materials
- Developing links with child survival programs

Reaching the Clients

Leader: Reynaldo Pareja

Champions: Laura Raney, Shea Rutstein

Activity	Name, Organization
Complete focus groups in 2+ countries (Bolivia, Peru, others)	CATALYST
Conduct joint analysis of FG data	R. Pareja, CATALYST, Champions
Define generic target audiences (manual, strategies)	CATALYST, Champions
Define generic Monitoring and Evaluation Indicators	R. Pareja, CATALYST, Champions
Share info on behavioral aspects of BS	Champions and CATALYST
Identify and work with Mass media	Champions and CATALYST
Identify research gaps through focus groups	Champions, CATALYST and JHU
Develop action research plan	R. Pareja, S. Rutstein
Define clients by target audiences	R. Pareja, CATALYST, Champions
Define cultural norms for BS by countries and subcultures	R. Pareja, CATALYST, Champions

Key next steps for the Reaching the Clients Working Group include:

- Analyzing focus group data
- Determining target audiences and messages
- Sharing information
- Analyzing data specific to ANE countries (Shea Rutstein)

IX. Next Steps

CATALYST support for Working Groups will include:

- Activating the Optimal Birth Spacing Interval Program
- Hosting periodic champions working group meetings
- Coordinating with and supporting the three working groups (and others if developed)
- Developing website, listserve and other communication mechanisms
- Organizing focus groups and other research

A technical paper benchmarking the research on birth spacing is being drafted by CATALYST. Selected birth spacing champions will be invited to review and comment on the draft document in preparation for wider dissemination and publication.

USAID and CATALYST will organize a regional conference for Asia/Near East PHN staff, counterparts and others in the region in New Delhi, India*, in October 2002. Shea Rutstein will analyze birth spacing patterns in the Asia/Near East countries participating in the conference. Agustín Conde-Agudelo will conduct further studies of the impacts of the confounding factors controlled for in his previous research.

Working Groups will be contacted about activities in the action plans by the respective group leaders.

The next meeting of the CATALYST Birth Spacing Champions will be held in September 2002.

*** Due to the on political situation in India during the summer 2002, location of this conference has been changed to Siem Riep, Cambodia.**

April 4, 2002

Dear Colleague,

The CATALYST Consortium cordially invites you to the second meeting of Birth Spacing Champions. The Champions Meeting will be held on Thursday, May 2nd from 9:15 AM - 3:30 PM at the University of California Washington Center, located at 1608 Rhode Island Avenue, NW, Washington, DC 20036.

The objectives of this meeting are to:

1. Present research undertaken by Dr. Agustin Conde-Agudelo, Director of the Department of Obstetrics and Gynecology of the Clinical Foundation Valle del Lili in Cali, Colombia and Consultant to WHO/PAHO. Dr. Conde-Agudelo has conducted new research on the association of birth intervals and maternal and perinatal morbidity and mortality. His research includes an analysis of the relationship between early pregnancy and health outcomes in adolescents.
2. Present new research findings by Bill Jansen of PRIME II, on evidence of the demand for delaying pregnancies, especially primary pregnancies, in 0-2 parity women ages 15-24 in 15 countries.
3. Present CATALYST's proposed strategy for a global Birth Spacing Initiative.
4. Clarify the working groups' objectives and agree on action plans, including responsibilities and schedules for implementation.

Anticipated outcomes of the meeting are:

1. Increased awareness and improved understanding of new birth spacing research and identification of additional research needs.
2. Agreement on a strategy to guide CATALYST and the Birth Spacing Champions in activities to place birth spacing on the global agenda.
3. Development and consensus of action plans for the Champions working groups.

Please RSVP by April 26th to Laurie Richardson via email at lrichardson@rhcatalyst.org or by phone at 202.775.1977 ext. 103. Please note that the venue for this meeting, UCWC, has strict security procedures. Will we need to provide UCWC with a list of participants to be admitted, therefore, please be sure to let us know if you are coming.

We look forward to seeing you.

Sincerely,

Marcia Townsend
CATALYST Consortium

Maureen Norton
USAID CTO

Copy of Presentations

**EFFECT OF INTERPREGNANCY INTERVAL
ON ADVERSE PERINATAL OUTCOMES
IN LATIN AMERICA**

Agustín Conde-Agudelo, MD, MPH

**LATIN AMERICAN CENTER FOR PERINATOLOGY AND HUMAN
DEVELOPMENT (PAHO/WHO)**

MONTEVIDEO - URUGUAY

OBJECTIVE

**To evaluate interpregnancy interval in relation to
adverse perinatal outcomes in Latin America**

METHODS

- **DESIGN: RETROSPECTIVE CROSS SECTIONAL STUDY**
- **DATA SOURCE:**
 - **PERINATAL INFORMATION SYSTEM DATABASE (SIP)**
 - **OVER 2 MILLION PREGNANCIES RECORDED FROM 1985- 2000 FROM LATIN AMERICA AND THE CARIBBEAN**
- **INCLUSION CRITERIA: PAROUS WOMEN DELIVERING SINGLETON INFANTS AND WHOSE PREVIOUS PREGNANCY ENDED IN LIVE INFANT**

METHODS

INDEPENDENT VARIABLE:

- **INTERPREGNANCY INTERVAL: TIME ELAPSED BETWEEN THE WOMAN'S LAST DELIVERY AND THE DATE OF THE LAST MENSTRUAL PERIOD FOR THE INDEX PREGNANCY**

DEPENDENT VARIABLES

- **PERINATAL OUTCOMES: LOW BIRTH WEIGHT (<2500g), VERY LOW BIRTH WEIGHT (<1500 G), PRETERM DELIVERY (<37 WEEKS), VERY PRETERM DELIVERY (<32 WEEKS), SMALL FOR GESTATIONAL AGE, FETAL DEATH, NEONATAL DEATH, LOW APGAR SCORES AT 5 MIN**

METHODS

STATISTICAL ANALYSIS

- **RATES OF ADVERSE PERINATAL OUTCOMES**
- **ODDS RATIO AS MEASURE OF ASSOCIATION BETWEEN INTERPREGNANCY INTERVAL AND ADVERSE PERINATAL OUTCOMES**
- **ADJUSTED ODDS RATIO DERIVED THROUGH LOGISTIC REGRESSION ANALYSIS**

METHODS

CONFOUNDING FACTORS TAKEN INTO ACCOUNT

Maternal age
Parity
Mother's education
Marital status
Cigarette smoking
Pre-pregnancy body mass index
History of miscarriage
History of stillbirth
History of early neonatal death
History of low birth weight

METHODS

CONFOUNDING FACTORS TAKEN INTO ACCOUNT

Gestational age at first attendance for antenatal care

Number of antenatal visits

Geographic area

Hospital type,

Year of delivery

- **Neonatal death and low Apgar scores at 5 minutes were additionally adjusted for birth weight and gestational age**

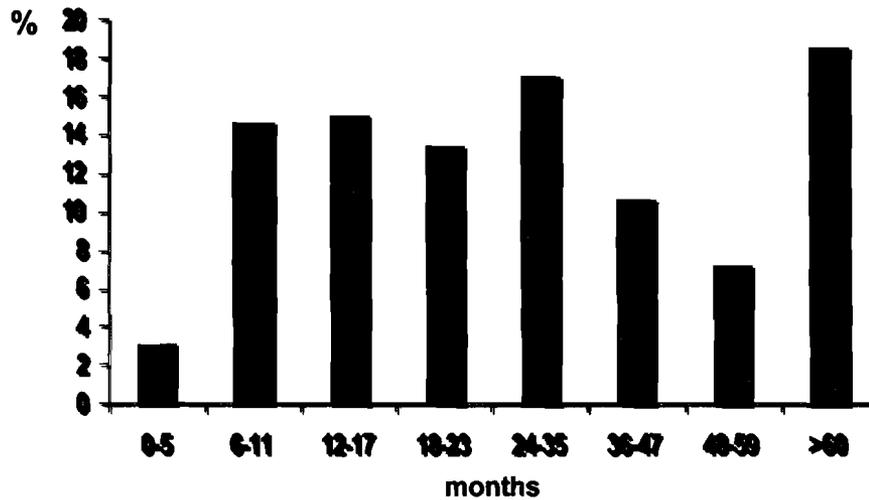
RESULTS

STUDY PROFILE

- **TOTAL PREGNANCIES RECORDED AT SIP: 2.005.500**
- **EXCLUDED: 758 108 NULLIPAROUS WOMEN
23 259 MULTIPLE PREGNANCIES
143 483 (11.7%) WOMEN WITH MISSING
OR IMPLAUSIBLE INFORMATION**
- **INCLUDED: 1 080 650**

RESULTS

DISTRIBUTION OF THE INTERPREGNANCY INTERVALS



Distribution of sociodemographic and obstetric characteristics according to interpregnancy interval. Figures are percentage of women

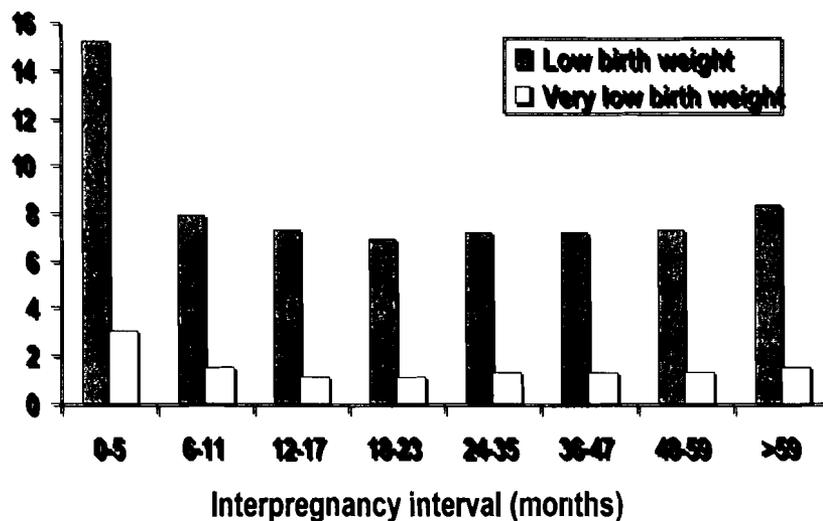
Characteristic		Interpregnancy interval (months)							
		0-5 (33286)	6-11 (158640)	12-17 (163177)	18-23 (144807)	24-35 (185000)	36-47 (115760)	48-59 (78977)	≥ 60 (201003)
Maternal age (yr)	<19	19.3	18.1	15.1	10.4	6.6	3.3	1.8	0.6
	20-34	73.2	73.9	74.7	78.3	80.8	82.3	83.5	68.9
	≥ 35	7.5	8.0	10.2	11.3	12.7	14.9	15.7	30.5
Parity	1	38.3	39.3	39.9	37.5	38.6	40.3	40.3	35.7
	2	26.8	25.3	24.7	24.1	23.9	25.0	25.0	29.4
	≥ 3	34.9	35.4	35.4	38.4	37.5	34.7	34.7	34.9
Marital status	With partner	85.5	85.9	85.2	85.8	84.7	86.2	86.2	87.7
	Without partner	14.5	14.1	14.8	14.2	15.3	12.8	13.8	12.3

Distribution of sociodemographic and obstetric characteristics according to interpregnancy interval. Figures are percentage of women

Characteristic	Interpregnancy interval (months)							
	0-5 (33286)	6-11 (158640)	12-17 (163177)	18-23 (144807)	24-35 (185000)	36-47 (115760)	48-59 (78977)	≥ 60 (201003)
Mother's education (yr)								
<12	56.5	59.0	58.9	59.1	56.6	56.8	57.5	58.1
≥ 12	43.5	41.0	41.1	40.9	43.4	43.2	42.5	41.9
Late prenatal care onset (≥ 27wk)	38.2	34.0	32.0	29.6	25.9	27.4	23.1	20.9
No prenatal care	29.0	23.8	22.0	20.9	19.1	16.7	14.0	12.8
Smoker	11.9	11.7	11.4	10.3	9.9	10.9	12.5	13.4
Underweight (BMI <19.8 kg/m ²)	16.2	16.2	16.7	16.5	16.3	17.1	16.6	10.8
Obese (BMI >29 kg/m ²)	7.9	8.7	9.5	10.1	10.5	11.4	12.0	14.3
History of abortion	41.5	27.3	22.9	23.0	26.5	24.0	24.9	7.1
History of stillbirth	5.9	5.4	4.6	4.4	3.3	3.4	2.8	2.7
History of early neonatal death	4.5	4.3	3.4	3.6	2.9	2.8	2.5	
Previous low birth weight	10.7	7.8	6.9	6.0	6.3	6.5	7.1	6.2

RESULTS

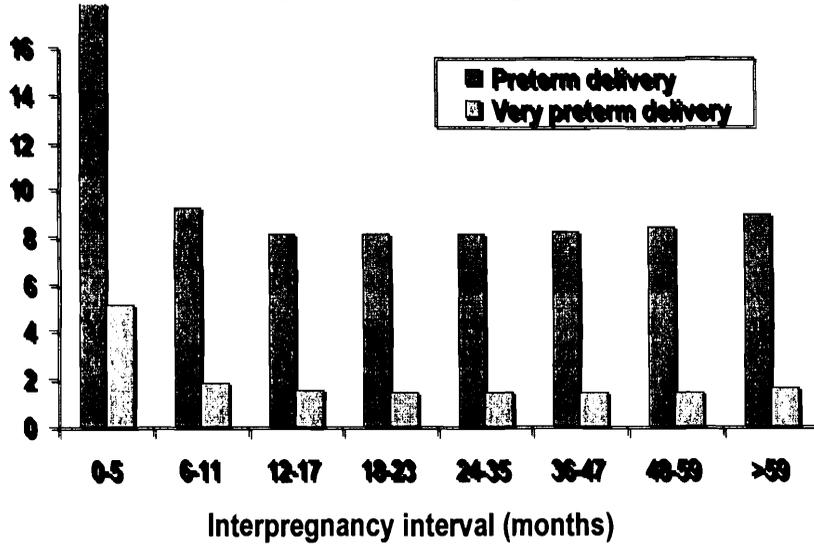
Rates of adverse perinatal outcomes according to interpregnancy interval. Figures are percentage of infants



25

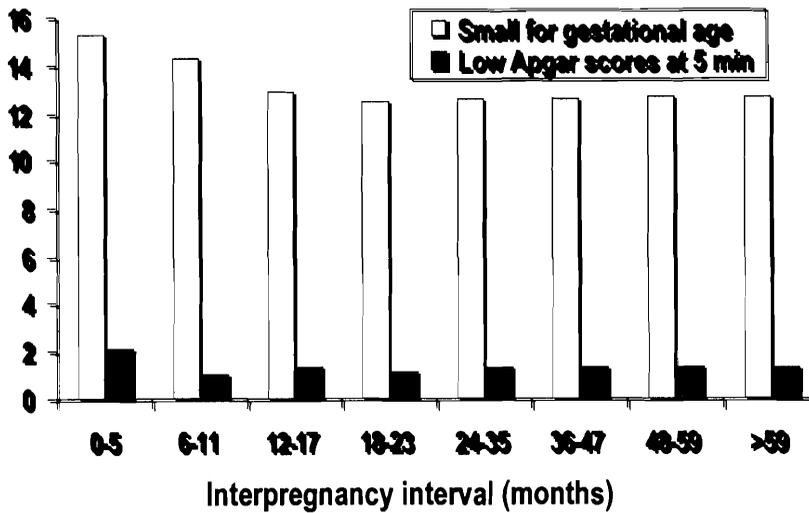
RESULTS

Rates of adverse perinatal outcomes according to interpregnancy interval. Figures are percentage of infants



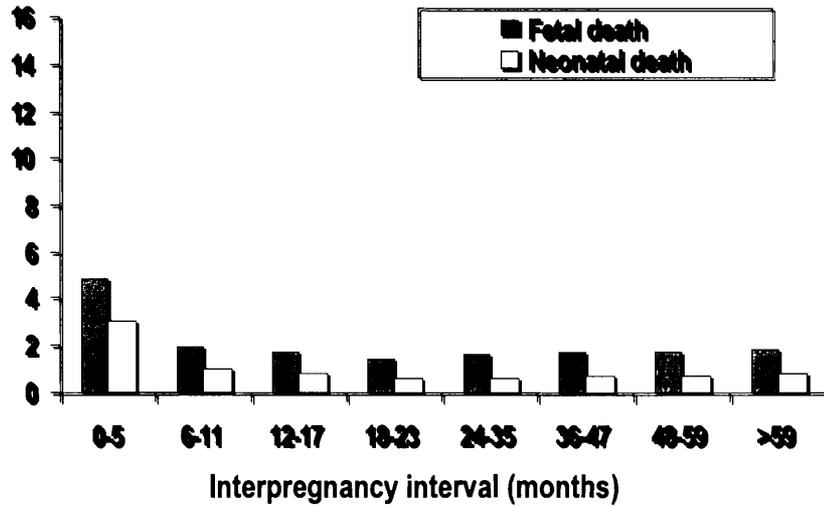
RESULTS

Rates of adverse perinatal outcomes according to interpregnancy interval. Figures are percentage of infants



RESULTS

Rates of adverse perinatal outcomes according to interpregnancy interval. Figures are percentage of infants



Adjusted odds ratio and 95% confidence intervals for adverse perinatal outcomes according to interpregnancy interval

Outcome	Interpregnancy interval (months)							
	0-5	6-11	12-17	18-23	24-35	36-47	48-59	≥ 60
Low birth weight	2.14 (2.02-2.28)	1.15 (1.10-1.21)	1.02 (0.98-1.06)	1.0	1.02 (0.98-1.07)	1.0 (0.96-1.04)	1.03 (0.99-1.08)	1.19 (1.15-1.24)
Very low birth weight	2.25 (1.98-2.54)	1.23 (1.12-1.35)	1.0 (0.91-1.10)	1.0	1.07 (0.97-1.18)	1.02 (0.92-1.13)	1.04 (1.94-2.05)	1.15 (1.06-1.25)
Preterm delivery	2.31 (2.20-2.43)	1.15 (1.10-1.20)	1.0 (0.96-1.05)	1.0	1.00 (0.96-1.04)	1.01 (0.97-1.06)	1.04 (1.00-1.08)	1.09 (1.05-1.14)
Very preterm delivery	3.27 (2.98-3.58)	1.33 (1.24-1.43)	1.03 (0.95-1.12)	1.0	1.01 (0.94-1.09)	1.00 (0.94-1.07)	0.97 (0.88-1.07)	1.16 (1.09-1.24)

27

Adjusted odds ratio and 95% confidence intervals for adverse perinatal outcomes according to interpregnancy interval in a cohort of 1 080 650 Latin American and Caribbean parous women delivering singleton infants, 1985-2000

Outcome	Interpregnancy interval (months)							
	0-5	6-11	12-17	18-23*	24-35	36-47	48-59	≥ 60
Small for gestational age	1.25 (1.20-1.31)	1.17 (1.14-1.20)	1.01 (0.97-1.06)	1.0	1.00 (0.97-1.04)	1.01 (0.99-1.03)	1.00 (0.96-1.04)	1.01 (0.98-1.04)
Fetal death	2.40 (2.14-2.69)	1.24 (1.14-1.35)	1.07 (1.00-1.15)	1.0	1.06 (0.99-1.15)	1.09 (1.00-1.19)	1.08 (0.98-1.19)	1.21 (1.15-1.27)
Neonatal death	2.02 (1.48-2.63)	1.27 (1.12-1.44)	1.08 (0.96-1.21)	1.0	1.02 (0.91-1.14)	1.03 (0.92-1.15)	1.05 (0.93-1.18)	1.18 (1.06-1.31)
Low Apgar scores at 5 min.	1.18 (0.98-1.42)	0.92 (0.85-1.00)	1.09 (0.93-1.07)	1.0	1.08 (1.00-1.17)	1.07 (0.98-1.17)	0.94 (0.86-1.03)	1.05 (0.97-1.14)

* Reference group

THE CASE OF LATIN AMERICA

CURRENTLY

- NUMBER OF BIRTHS PER YEAR: 11 MILLION
- PERINATAL MORTALITY RATE: 39 X 1000 LIVE BIRTHS
- TOTAL PERINATAL DEATHS: 429.000

IF FAMILIES CHOSE TO DELAY CONCEPTION FOR 18-23 MONTHS AFTER THE PRECEDING BIRTH, IT IS ESTIMATED THAT PERINATAL MORTALITY WOULD DROP 14.1%

- TOTAL PERINATAL DEATHS WOULD FALL BY 60.500 ANNUALLY

CONCLUSION

IN LATIN AMERICA, SHORT (<12 MONTHS) AND LONG (\geq 60 MONTHS) INTERPREGNANCY INTERVALS ARE INDEPENDENTLY ASSOCIATED WITH ADVERSE PERINATAL OUTCOMES

**MATERNAL MORBIDITY AND MORTALITY
ASSOCIATED WITH INTERPREGNANCY
INTERVAL**

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MONTEVIDEO - URUGUAY

BMJ 2000;321:1255-9

OBJECTIVE

**TO STUDY THE IMPACT OF
INTERPREGNANCY INTERVAL ON
MATERNAL MORBIDITY AND MORTALITY**

METHODS

- **Perinatal Information System (SIP), 1985-1997**
- **308 Hospitals**
- **19 countries**
- **Inclusion criteria:**
 - Parous women**
 - Singleton infants**
 - Previous pregnancy ≥ 20 weeks**
- **Adverse maternal outcomes: Classified according to ICD -10**
- **Rates of adverse maternal outcomes and odds ratios with 95% CI - Multiple logistic regression analysis**

METHODS

- **Interpregnancy Interval: Time elapsed between the woman's last delivery and the date of the last menstrual period for the index pregnancy (birth to conception interval).**
- **Birth to birth interval: Interval between two consecutive births**
- **Birth to birth interval = Interpregnancy Interval + 9 months**

METHODS

CONFOUNDING FACTORS TAKEN INTO ACCOUNT

Maternal age
Parity
Mother's education
Marital status
Cigarette smoking
Pre-pregnancy body mass index
History of miscarriage
History of Stillbirth
History of early neonatal death

METHODS

CONFOUNDING FACTORS TAKEN INTO ACCOUNT

Gestational age at first attendance for antenatal care
Number of antenatal visits
Geographic area
Hospital type,
Year of delivery

- **Pre-eclampsia, eclampsia, gestational diabetes mellitus, and third trimester bleeding were also controlled for history of chronic hypertension.**

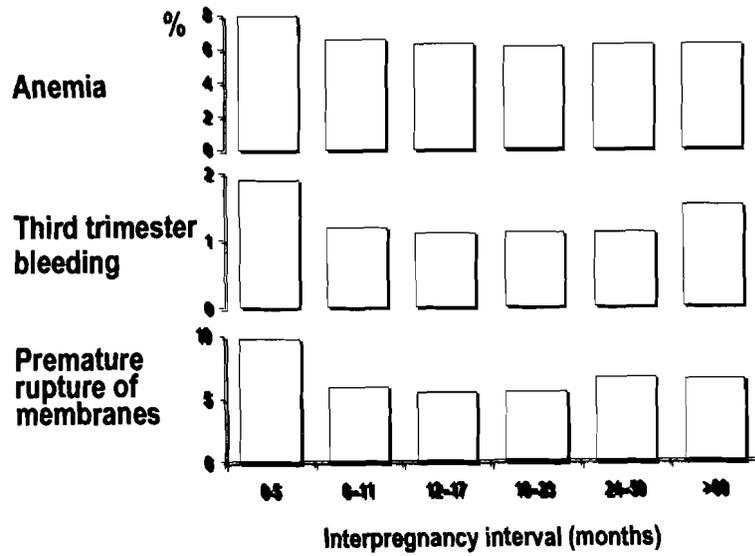
RESULTS

- 1.008.954 pregnancies
- Study population: 456.889 women
- Distribution of interpregnancy intervals:
 - <6 months: 2.8%
 - 6-11 months: 13.9%
 - 12 - 17 months: 14.7%
 - 18 - 23 months: 13.0%
 - 24 - 35 months: 16.8%
 - 36 - 47 months: 11.5%
 - 48 - 59 months: 7.8%
 - ≥60 meses: 19.5%
- 61.2% of women had interpregnancy intervals <36 months

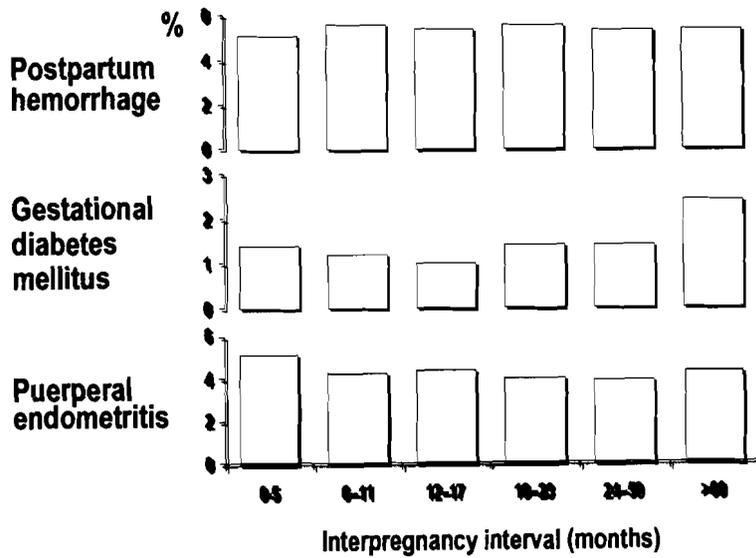
DISTRIBUTION OF SOCIODEMOGRAPHIC AND OBSTETRIC CHARACTERISTICS ACCORDING TO INTERPREGNANCY INTERVAL

- Short interpregnancy intervals (< 6 months):
 - ↓ maternal age
 - ↑ history of miscarriage, fetal death , and early neonatal death
 - ↓ number of prenatal visits
 - ↓ body mass index
 - Late onset of prenatal care
- Long interpregnancy intervals (≥ 60 months):
 - ↑ maternal age
 - ↑ body mass index
 - ↑ history of chronic hipertension
- No differences with regard to: Number of previous deliveries, mother's education, marital status, and cigarette smoking

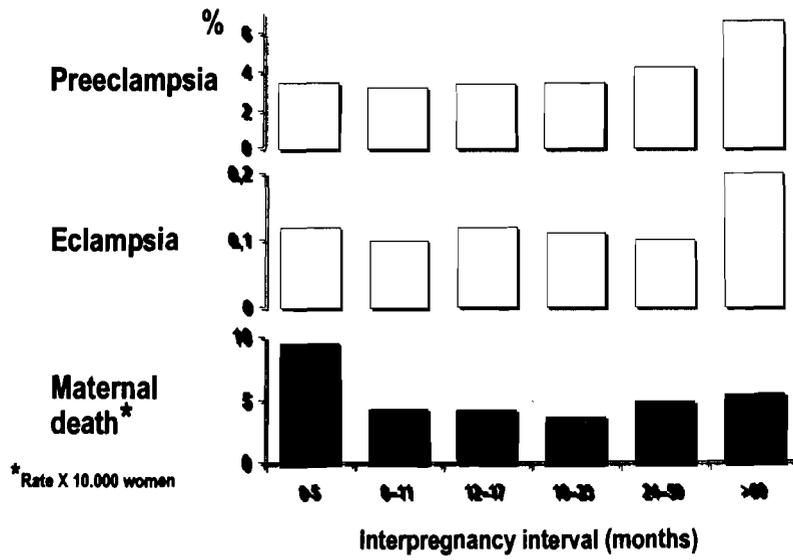
RATES OF ADVERSE MATERNAL OUTCOMES ACCORDING TO INTERPREGNANCY INTERVAL



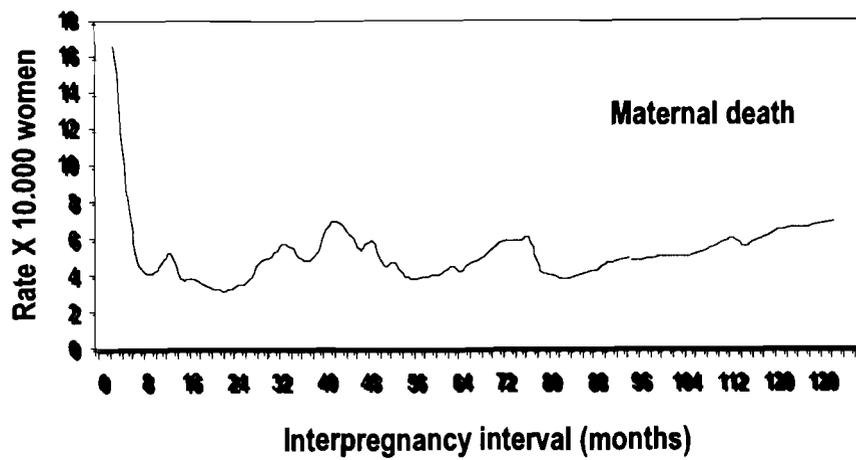
RATES OF ADVERSE MATERNAL OUTCOMES ACCORDING TO INTERPREGNANCY INTERVAL



RATES OF ADVERSE MATERNAL OUTCOMES ACCORDING TO INTERPREGNANCY INTERVAL



MATERNAL FATALITY RATE ACCORDING TO INTERPREGNANCY INTERVAL



**ADJUSTED ODDS RATIOS FOR ADVERSE MATERNAL OUTCOMES
ACCORDING TO INTERPREGNANCY INTERVAL**

OUTCOME	INTERPREGNANCY INTERVAL (months)					
	0-5	6-11	12-17	18-23	24-59	≥60
	Odds ratio (95% confidence interval)					
Anemia	1.3 (1.2-1.4)	1.0 (1.0-1.1)	1.0 (1.0-1.1)	1.0	1.0 (1.0-1.1)	1.0 (1.0-1.1)
Third trimester bleeding	1.7 (1.4-2.2)	1.0 (0.9-1.2)	1.0 (0.9-1.1)	1.0	1.0 (1.0-1.2)	1.1 (1.0-1.2)
Premature rupture of membranes	1.7 (1.5-1.9)	1.0 (1.0-1.1)	1.0 (0.9-1.1)	1.0	1.1 (1.0-1.2)	1.0 (0.9-1.1)
Postpartum hemorrhage	0.9 (0.8-1.1)	1.0 (0.9-1.1)	1.0 (0.9-1.1)	1.0	1.0 (0.9-1.0)	0.9 (0.8-1.0)
Gestational diabetes mellitus	1.0 (0.7-1.4)	1.0 (0.8-1.1)	0.9 (0.7-1.1)	1.0	1.0 (0.8-1.2)	1.3 (0.9-1.6)

**ADJUSTED ODDS RATIOS FOR ADVERSE MATERNAL OUTCOMES
ACCORDING TO INTERPREGNANCY INTERVAL**

OUTCOME	INTERPREGNANCY INTERVAL (months)					
	0-5	6-11	12-17	18-23	24-59	≥60
	Odds ratio (95% confidence interval)					
Puerperal endometritis	1.3 (1.2-1.4)	1.0 (0.9-1.1)	1.1 (1.0-1.2)	1.0	1.0 (0.9-1.0)	1.0 (0.9-1.2)
Preeclampsia	1.0 (0.9-1.1)	1.0 (0.9-1.1)	1.0 (0.9-1.1)	1.0	1.1 (1.0-1.2)	1.8 (1.7-1.9)
Eclampsia	1.1 (0.6-2.3)	1.0 (0.7-1.4)	1.0 (0.8-1.2)	1.0	1.2 (0.8-2.3)	1.8 (1.4-2.3)
Maternal death	2.5 (1.2-5.4)	1.1 (0.5-2.3)	1.0 (0.6-2.2)	1.0	1.1 (0.6-2.4)	1.1 (0.7-2.7)

**ADDITIONAL ANALYSES: ADJUSTED ODDS RATIOS (95% CI) FOR
ADVERSE MATERNAL OUTCOMES ACCORDING TO
INTERPREGNANCY INTERVAL (24-59 MONTHS)**

OUTCOME	INTERPREGNANCY INTERVAL (months)					
	18-23	24-35	36-47	48-59		
	Odds ratio (95% confidence interval)					
Anemia	1.0	1.0 (1.0-1.1)	1.0 (1.0-1.1)	1.0 (1.0-1.1)		
Third trimester bleeding	1.0	1.0 (0.9-1.1)	1.0 (0.9-1.1)	1.0 (0.9-1.2)		
Premature rupture of membranes	1.0	1.1 (1.0-1.2)	1.1 (1.0-1.2)	1.1 (1.0-1.2)		
Postpartum hemorrhage	1.0	1.0 (0.9-1.1)	1.0 (0.9-1.1)	1.0 (1.0-1.1)		
Gestational diabetes mellitus	1.0	1.0 (0.9-1.1)	1.0 (0.9-1.1)	1.0 (1.8-1.1)		

**ADDITIONAL ANALYSES: ADJUSTED ODDS RATIOS (95% CI) FOR
ADVERSE MATERNAL OUTCOMES ACCORDING TO
INTERPREGNANCY INTERVAL (24-59 MONTHS)**

OUTCOME	INTERPREGNANCY INTERVAL (months)					
	18-23	24-35	36-47	48-59		
	Odds ratio (95% confidence interval)					
Puerperal endometritis	1.0	1.0 (0.9-1.1)	1.0 (0.9-1.1)	1.0 (0.9-1.0)		
Preeclampsia	1.0	1.0 (0.9-1.1)	1.1 (1.0-1.1)	1.1 (1.0-1.1)		
Eclampsia	1.0	0.9 (0.6-1.2)	1.2 (0.8-1.4)	1.2 (0.8-1.4)		
Maternal death	1.0	1.1 (0.6-2.1)	1.3 (0.6-2.4)	1.2 (0.6-2.6)		

CONCLUSIONS

INTERPREGNANCY INTERVALS LESS THAN 6 MONTHS AND LONGER THAN 59 MONTHS ARE ASSOCIATED WITH AN INCREASED RISK OF ADVERSE MATERNAL OUTCOMES

THE OPTIMAL INTERPREGNANCY INTERVAL WOULD BE 18 TO 23 MONTHS (BIRTH TO BIRTH INTERVAL 27 TO 32 MONTHS)

**INTERPREGNANCY INTERVALS AMONG
ADOLESCENTS WHOSE PREVIOUS
PREGNANCY ENDED IN ABORTION
IN LATIN AMERICA**

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MONTEVIDEO - URUGUAY

MATERNAL AGE (YEARS) AFTER LIVE BIRTH					
Characteristic	≤15 (N=33498)	16-17 (n=119723)	18-19 (n=344626)	All adolescents (n=344626)	20-24 (n=509751)
Interpregnancy interval (months)					
<6	18.2	8.7	5.9	8.0	3.4
6-11	25.0	33.6	30.4	31.1	17.8
12-17	25.0	28.9	24.9	26.3	17.8
18-23	13.6	16.1	15.1	15.3	16.1
24-59	15.9	10.7	22.6	17.8	38.3
≥ 60	2.3	1.9	1.2	1.5	6.5
Previous miscarriage					
None	97.5	95.1	92.3	93.8	85.9
1	2.2	4.5	7.0	5.7	11.8
2	0.2	0.3	0.6	0.4	1.9
3+	0.0	0.1	0.1	0.1	0.4

MATERNAL AGE (YEARS) AFTER ABORTION					
Characteristic	≤15 (N=837)	16-17 (n=5866)	18-19 (n=14738)	All adolescents (n=2141)	20-24 (n=71875)
Interpregnancy interval (months)					
<6	38.7	31.3	12.6	18.6	7.3
6-11	34.4	30.4	32.0	31.5	20.4
12-17	12.5	16.3	21.9	20.0	16.1
18-23	10.3	11.7	12.5	12.1	15.2
24-59	4.1	10.2	19.4	16.3	35.1
≥ 60	0.0	0.1	1.6	1.5	5.9

**MATERNAL – PERINATAL MORBIDITY AND
MORTALITY ASSOCIATED TO ADOLESCENT
PREGNANCY IN LATIN AMERICA**

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MONTEVIDEO - URUGUAY

OBJECTIVE

**TO INVESTIGATE WHETHER ADOLESCENT
PREGNANCY IS ASSOCIATED WITH
INCREASED RISK OF ADVERSE
PREGNANCY OUTCOMES**

METHODS

- **DESIGN: RETROSPECTIVE CROSS SECTIONAL STUDY**
- **DATA SOURCE**
 - **PERINATAL INFORMATION SYSTEM DATABASE (SIP)**
 - **OVER 2 MILLION PREGNANCIES RECORDED FROM 1985- 2000 FROM LATIN AMERICA**
- **INCLUSION CRITERIA: WOMEN AGED 10-24 YEARS DELIVERING SINGLETON INFANTS OF AT LEAST 20 WEEKS' GESTATION OR AT LEAST 400 g BIRTH WEIGHT**

METHODS

INDEPENDENT VARIABLE

- **AGE: COMPLETED YEARS AT TIME OF DELIVERY**

DEPENDENT VARIABLES

- **MATERNAL OUTCOMES: PRE-ECLAMPSIA, ECLAMPSIA, GESTATIONAL DIABETES MELLITUS, URINARY TRACT INFECTION, PREMATURE RUPTURE OF MEMBRANES**

METHODS

- **DEPENDENT VARIABLES**
- **MATERNAL OUTCOMES:**
THIRD TRIMESTER BLEEDING, ANEMIA, CESAREAN DELIVERY, OPERATIVE VAGINAL DELIVERY, EPISIOTOMY, POSTPARTUM HEMORRHAGE, PUERPERAL ENDOMETRITIS, MATERNAL DEATH (WHO DEFINITION)

METHODS

- **DEPENDENT VARIABLES**
- **PERINATAL OUTCOMES:**
LOW BIRTH WEIGHT (<2500 g), VERY LOW BIRTH WEIGHT (<1500 G), PRETERM DELIVERY (<37 WEEKS), VERY PRETERM DELIVERY (<32 WEEKS), SMALL FOR GESTATIONAL AGE, FETAL DEATH, NEONATAL DEATH, LOW APGAR SCORES AT 5 MIN

METHODS

STATISTICAL ANALYSIS

- **RATES OF MATERNAL AND PERINATAL OUTCOMES**
- **ODDS RATIO AS MEASURE OF ASSOCIATION BETWEEN MATERNAL AGE AND ADVERSE PREGNANCY OUTCOMES**
- **ADJUSTED ODDS RATIO DERIVED THROUGH LOGISTIC REGRESSION ANALYSIS**

METHODS

CONFOUNDING FACTORS TAKEN INTO ACCOUNT

Parity
Mother's education
Marital status
Cigarette smoking
Interpregnancy interval
Pre-pregnancy body mass index
History of miscarriage
History of stillbirth
History of early neonatal death
History of low birth weight

METHODS

CONFOUNDING FACTORS TAKEN INTO ACCOUNT

Gestational age at first attendance for antenatal care

Number of antenatal visits

Geographic area

Hospital type,

Year of delivery

- Neonatal death and low Apgar scores at 5 minutes were additionally adjusted for birth weight and gestational age
- Pre-eclampsia, eclampsia, gestational diabetes mellitus, and third trimester bleeding were also controlled for history of chronic hypertension.

RESULTS

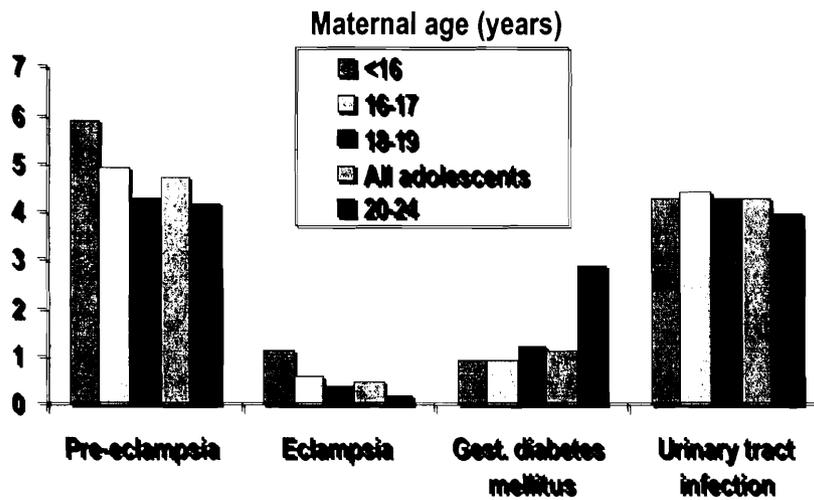
STUDY PROFILE

- TOTAL PREGNANCIES RECORDED AT SIP: 2.005.500
- EXCLUDED: 966 518 WOMEN \geq 25 YEARS OLD
12 132 MULTIPLE PREGNANCIES
172 473 (8.6%) WOMEN WITH MISSING
OR IMPLAUSIBLE INFORMATION

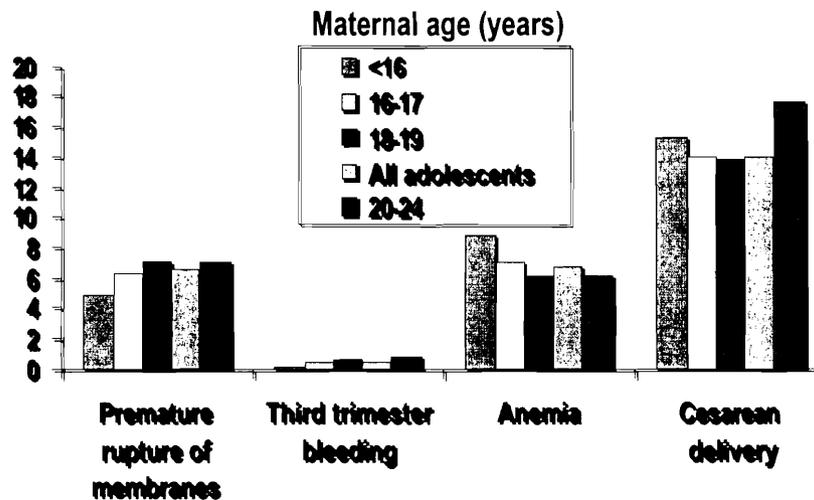
MATERNAL AGE (YEARS)					
Characteristic	≤15 (N=33498)	16-17 (n=119723)	18-19 (n=344626)	All adolescents (n=344626)	20-24 (n=509751)
Interpregnancy interval (months)					
<24	87.4	82.5	75.6	75.7	55.2
24-47	11.4	15.9	21.6	20.3	32.1
≥ 48	1.2	1.6	2.8	4.0	12.7
Pre-pregnancy body mass index /kg/m²)					
<19.8	10.9	10.4	10.1	10.3	7.7
19.8-26.0	72.2	68.1	66.9	67.4	61.1
26.1-29.0	10.9	14.6	16.1	15.5	18.5
>29.0	6.0	6.9	6.9	6.8	12.7
History of miscarriage					
Yes	2.5	4.9	6.2	5.6	14.1
No	97.5	95.1	93.8	94.4	85.9

MATERNAL AGE (YEARS)					
Characteristic	≤15 (N=33498)	16-17 (n=119723)	18-19 (n=344626)	All adolescents (n=344626)	20-24 (n=509751)
History of perinatal death					
Yes	0.5	1.6	2.4	1.9	3.7
No	99.5	98.4	97.6	98.1	96.3
Gestational age at first antenatal visit (weeks)					
1-13	19.6	20.8	21.3	21.0	26.7
14-26	53.8	47.1	48.4	48.5	43.8
≥ 27	26.6	32.1	30.3	30.5	29.5
Number of antenatal visits					
0	23.5	23.6	23.7	23.6	22.0
1-4	37.5	35.1	34.8	35.2	32.8
≥ 5	39.0	41.3	41.5	41.2	45.2

RATES (%) OF ADVERSE MATERNAL OUTCOMES
 Values are percentage of women

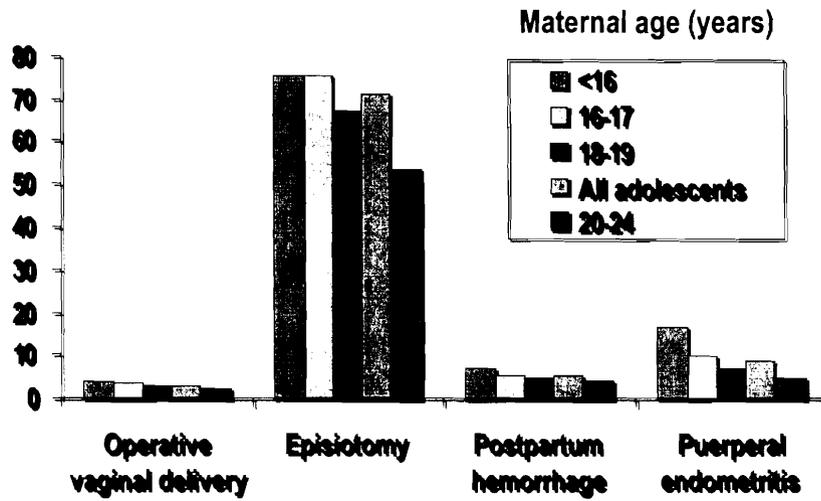


RATES (%) OF ADVERSE MATERNAL OUTCOMES
 Values are percentage of women

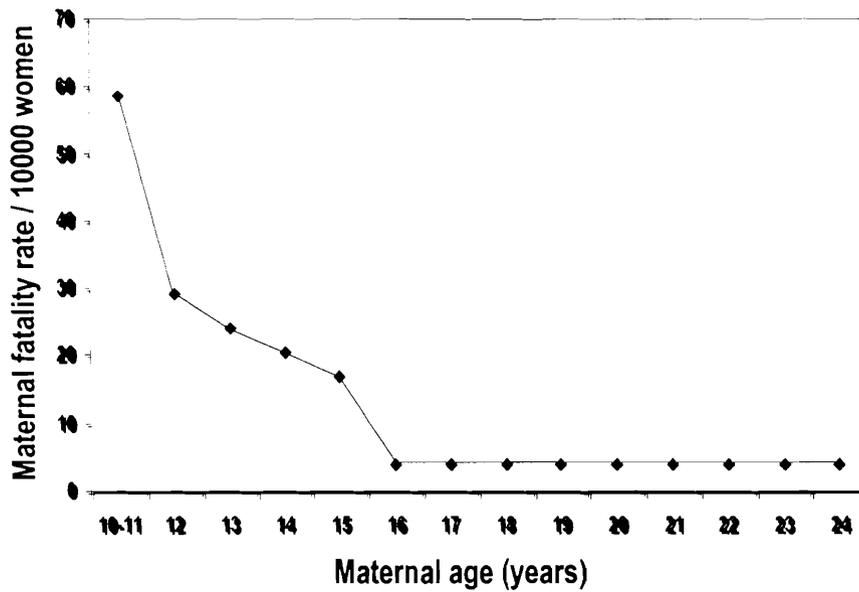


RATES (%) OF ADVERSE MATERNAL OUTCOMES

Values are percentage of women

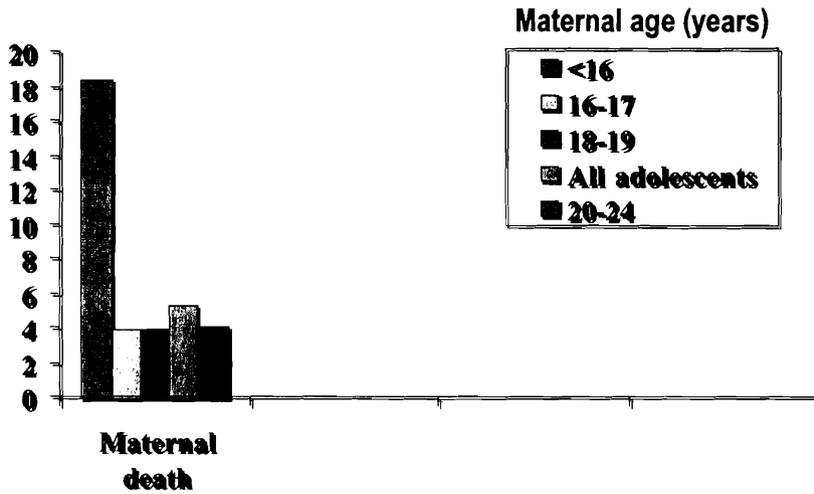


MATERNAL FATALITY RATE



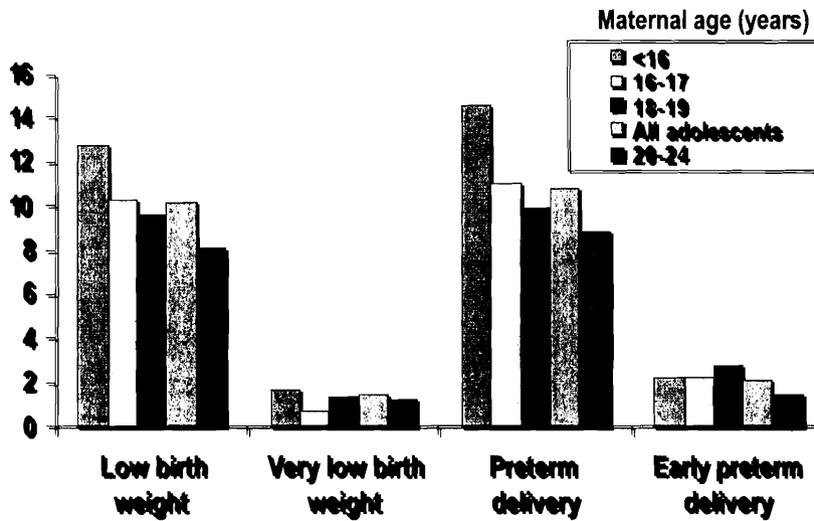
BEST AVAILABLE COPY

RATE x 10 000 WOMEN OF MATERNAL DEATH

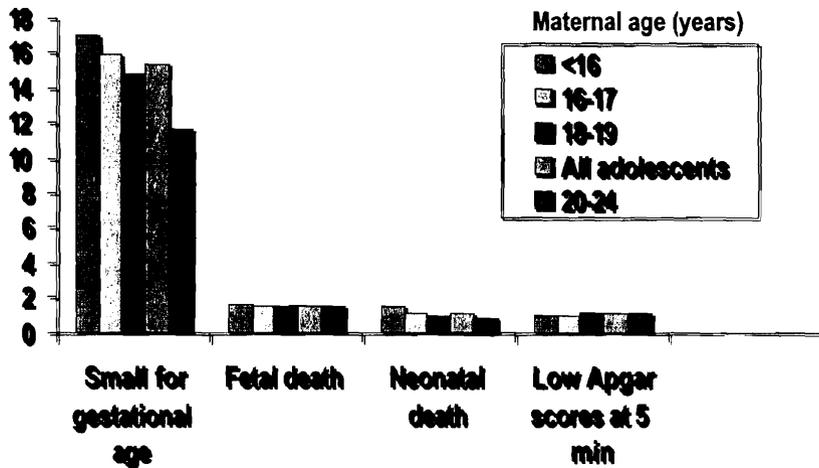


RATES (%) OF ADVERSE PERINATAL OUTCOMES

Values are percentage of infants



RATES (%) OF ADVERSE PERINATAL OUTCOMES
 Values are percentage of infants



**ADJUSTED ODDS RATIO (95% CONFIDENCE INTERVAL)
 FOR THE ASSOCIATION BETWEEN MATERNAL AGE
 AND ADVERSE MATERNAL OUTCOMES**

	Maternal age (years)				
	≤15	16-17	18-19	All adolescents ≤ 19	20-24*
Maternal death	4.09 (3.86-4.34)	0.98 (0.66-1.32)	1.00 (0.72-1.30)	1.12 (0.87-1.37)	1.0
Pre-eclampsia	1.08 (0.98-1.19)	1.04 (0.99-1.08)	1.00 (0.96-1.04)	1.01 (0.97-1.06)	1.0
Eclampsia	4.61 (3.86-5.42)	2.76 (2.32-3.21)	1.70 (1.49-1.93)	2.45 (2.23-2.68)	1.0
Gestational diabetes mellitus	0.34 (0.29-0.40)	0.35 (0.31-0.40)	0.44 (0.41-0.48)	0.39 (0.37-0.42)	1.0
Urinary tract infection	1.03 (0.95-1.12)	1.01 (0.96-1.07)	1.00 (0.96-1.05)	1.01 (0.98-1.04)	1.0

* Reference group

**ADJUSTED ODDS RATIO (95% CONFIDENCE INTERVAL)
FOR THE ASSOCIATION BETWEEN MATERNAL AGE
AND ADVERSE MATERNAL OUTCOMES**

	Maternal age (years)				
	≤15	16-17	18-19	All adolescents ≤ 19	20-24*
Premature rupture of membranes	0.95 (0.90-1.01)	0.98 (0.95-1.02)	1.01 (0.98-1.04)	0.99 (0.97-1.01)	1.0
Third trimester bleeding	0.24 (0.17-0.32)	0.59 (0.53-0.66)	0.70 (0.64-0.77)	0.66 (0.62-0.71)	1.0
Anemia	1.41 (1.33-1.50)	1.05 (1.00-1.10)	1.00 (0.97-1.03)	1.03 (0.99-1.07)	1.0
Cesarean delivery	0.87 (0.83-0.92)	0.80 (0.78-0.82)	0.83 (0.81-0.85)	0.83 (0.81-0.85)	1.0

* Reference group

**ADJUSTED ODDS RATIO (95% CONFIDENCE INTERVAL)
FOR THE ASSOCIATION BETWEEN MATERNAL AGE
AND ADVERSE MATERNAL OUTCOMES**

	Maternal age (years)				
	≤15	16-17	18-19	All adolescents ≤ 19	20-24*
Forceps delivery	1.44 (1.32-1.57)	1.29 (1.21-1.38)	1.16 (1.11-1.21)	1.24 (1.20-1.28)	1.0
Episiotomy	2.36 (2.27-2.46)	2.24 (2.19-2.30)	1.55 (1.52-1.59)	2.05 (2.02-2.09)	1.0
Postpartum hemorrhage	1.59 (1.50-1.70)	1.31 (1.24-1.39)	1.18 (1.13-1.24)	1.23 (1.19-1.27)	1.0
Puerperal endometritis	3.81 (3.64-4.00)	2.08 (2.01-2.15)	1.52 (1.46-1.59)	2.00 (1.95-2.05)	1.0

* Reference group

**ADJUSTED ODDS RATIO (95% CONFIDENCE INTERVAL)
FOR THE ASSOCIATION BETWEEN MATERNAL AGE
AND ADVERSE PERINATAL OUTCOMES**

	Maternal age (years)				
	≤15	16-17	18-19	All adolescents ≤ 19	20-24*
Low birth weight	1.62 (1.54-1.39)	1.27 (1.23-1.32)	1.20 (1.17-1.24)	1.25 (1.22-1.28)	1.0
Very low birth weight	1.25 (1.12-1.39)	1.24 (1.16-1.33)	1.10 (1.05-1.15)	1.15 (1.10-1.21)	1.0
Preterm delivery	1.66 (1.59-1.74)	1.25 (1.20-1.31)	1.15 (1.11-1.19)	1.22 (1.19-1.25)	1.0
Early preterm delivery	1.51 (1.37-1.67)	1.43 (1.34-1.53)	1.31 (1.25-1.37)	1.40 (1.35-1.45)	1.0

* Reference group

**ADJUSTED ODDS RATIO (95% CONFIDENCE INTERVAL)
FOR THE ASSOCIATION BETWEEN MATERNAL AGE
AND ADVERSE PERINATAL OUTCOMES**

	Maternal age (years)				
	≤15	16-17	18-19	All adolescents ≤ 19	20-24*
Small for gestational age	1.50 (1.45-1.56)	1.41 (1.37-1.46)	1.27 (1.24-1.31)	1.35 (1.32-1.38)	1.0
Fetal death	1.03 (0.92-1.15)	0.98 (0.91-1.06)	1.00 (0.95-1.06)	0.99 (0.95-1.04)	1.0
Neonatal death	1.51 (1.33-1.70)	1.05 (0.95-1.16)	1.01 (0.93-1.10)	1.02 (0.95-1.09)	1.0
Low Apgar scores at 5 min.	0.97 (0.85-1.10)	0.98 (0.91-1.06)	1.01 (0.94-1.09)	1.00 (0.95-1.05)	1.0

* Reference group

CONCLUSIONS

- **ADOLESCENT PREGNANCY IS INDEPENDENTLY ASSOCIATED WITH INCREASED RISK OF ADVERSE MATERNAL AND PERINATAL OUTCOMES.**
- **THE RISKS ARE MORE STRIKING AMONG EARLY ADOLESCENT PREGNANCIES**

Perinatal Mortality



Relationships between pregnancy intervals and perinatal mortality

Shea Rutstein, Ph.D.
Technical Director, ORC Macro



Methodology

- ◆ Logistic Regression Analysis
- ◆ Dependent variables
 - Miscarriages
 - Stillbirths
 - Early neonatal Mortality
 - Perinatal Mortality
- ◆ From pooled DHS data sets of surveys with a reproductive calendar



Methodology

- ◆ Controlling for
 - Mother's age at pregnancy
 - Mother's parity at pregnancy (births)
 - Result of previous pregnancy (where known)
 - Mother's education
 - Urban-Rural residence
 - Survey phase
 - Country



Definitions

- ◆ For the purpose of these analyses
 - Stillbirths are fetal deaths that occur at pregnancy durations of 7 or more months.
 - Miscarriages are fetal deaths at pregnancy durations of 0 to 6 months.
 - Early neonatal mortality are deaths to live born children that occur in the first week of life.
 - Perinatal mortality are the sum of stillbirths and early neonatal deaths.



Note on definitions

The duration of pregnancy line between miscarriage and stillbirth has varied in the last decade to take account of new life saving technology, being reduced from 28 weeks to 24, 22 or 20 weeks (depending on country and organization).

For the definition of perinatal mortality, the limit of 28 weeks has not been changed.

Due to that fact and the fact that there is practically no access to these new life saving technologies in LDCs, we use the 28 week limit in these analyses.



Sample sizes

- ◆ Data from 25 surveys in 18 countries
- ◆ Stillbirths: 179,920 pregnancies of 7 or more months duration
- ◆ Early neonatal deaths: 177,626 live births
- ◆ Perinatal mortality: 157,917 pregnancies of 7 or more months duration
- ◆ Miscarriage: 200,112 pregnancies

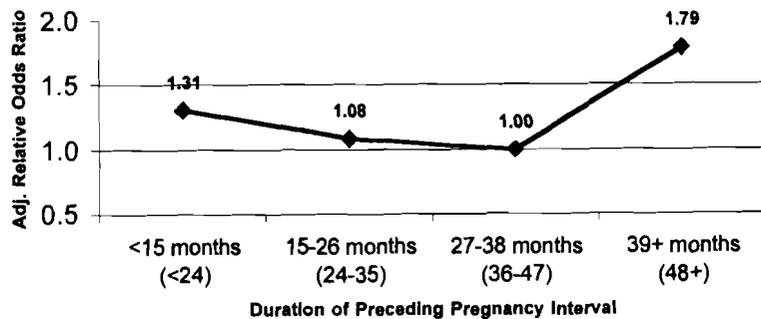


Stillbirths Results

- ◆ Risk of stillbirth compared with 27-38 month pregnancy interval:
 - Less than 15 months: 131 %
 - 15-26 months: 108 %
 - 27-38 months: 100 %
 - 39+ months: 179 %
 - First pregnancy: 186 %
- ◆ Lowest stillbirth mortality at 27-38 month pregnancy intervals (36-47 birth interval)



Stillbirths



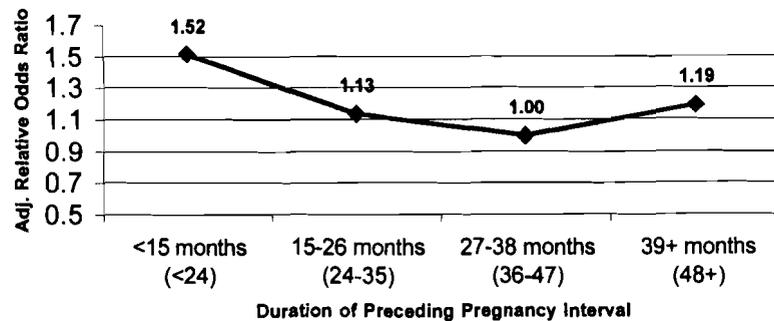


Early Neonatal Mortality Results

- ◆ Risk of early neonatal death compared with 27-38 month pregnancy interval:
 - Less than 15 months: 152 %
 - 15-26 months: 113 %
 - 27-38 months: 100 %
 - 39+ months: 119 %
 - First pregnancy: 125 %
- ◆ Lowest early nn mortality at 27-38 month pregnancy intervals (36-47 birth interval)



Early Neonatal Mortality



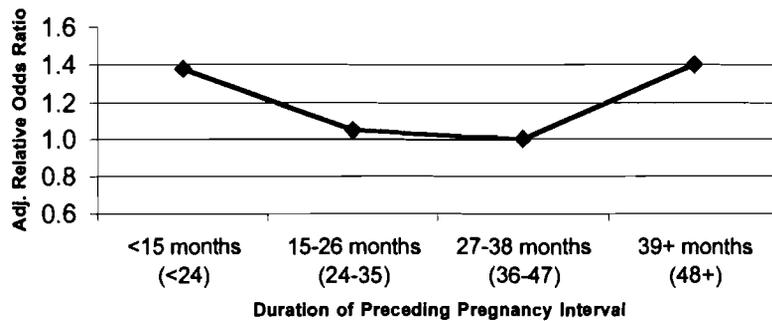


Perinatal Mortality Results

- ◆ Risk of perinatal mortality compared with 27-38 month pregnancy interval:
 - Less than 15 months: 137 %
 - 15-26 months: 105 %
 - 27-38 months: 100 %
 - 39+ months: 140 %
 - First pregnancy: 142 %
- ◆ Lowest perinatal mortality at 27-38 month pregnancy intervals (36-47 birth interval)



Perinatal Mortality



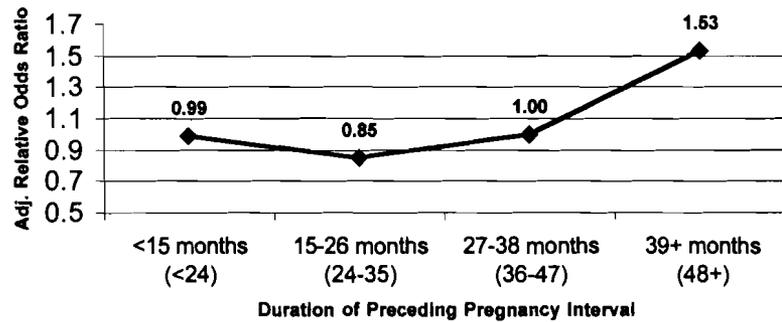


Miscarriages Results

- ◆ Risk of miscarriage compared with 27-38 month pregnancy interval:
 - Less than 15 months: 99 %
 - 15-26 months: 85 %
 - 27-38 months: 100 %
 - 39+ months: 153 %
 - First pregnancy: 100 %
- ◆ Lowest miscarriages at 15-26 month pregnancy intervals (24-35 birth interval)



Miscarriages





Overall Conclusions

- ◆ Too rapid childbearing poses substantial mortality risks for children.
- ◆ Women should wait at least 27 months to become pregnant again after a birth or a pregnancy termination.
- ◆ The optimal birth to next conception interval is 27 to 38 months. At this interval stillbirths, early neonatal and perinatal mortality are at their lowest levels.



Overall Conclusions

- ◆ The 27 to 38 month pregnancy interval corresponds to a 36 to 47 month birth interval.
- ◆ Birth intervals of three years or longer substantially decrease the risk of perinatal mortality compared to those of both two years and less than two years.
- ◆ However, too long pregnancy intervals may increase the risk of miscarriage.

Demand for Birth-Spacing in Young, Low-Parity Women:

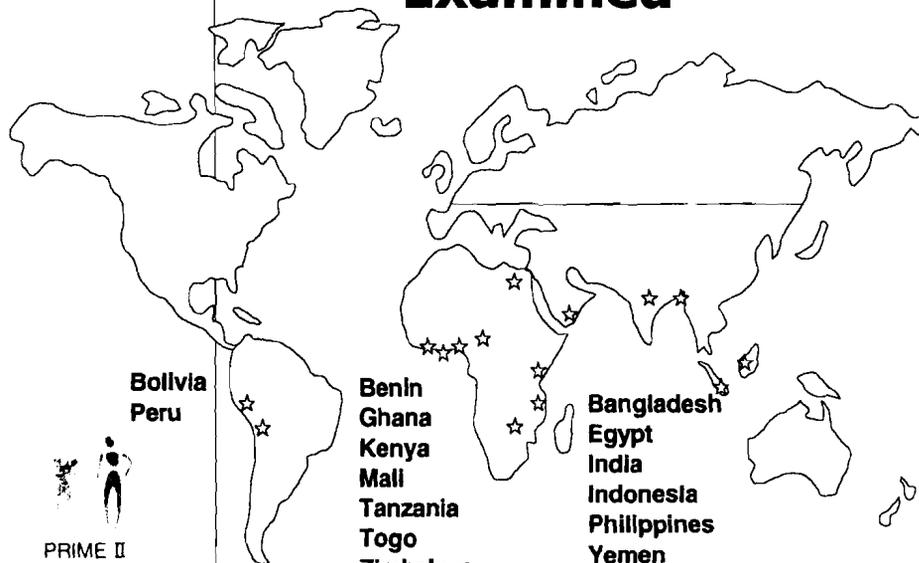
An Analysis of Fifteen Developing Countries

William H. Jansen II, Ph.D.
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PRIME II

Country Data Sets Examined



PRIME II

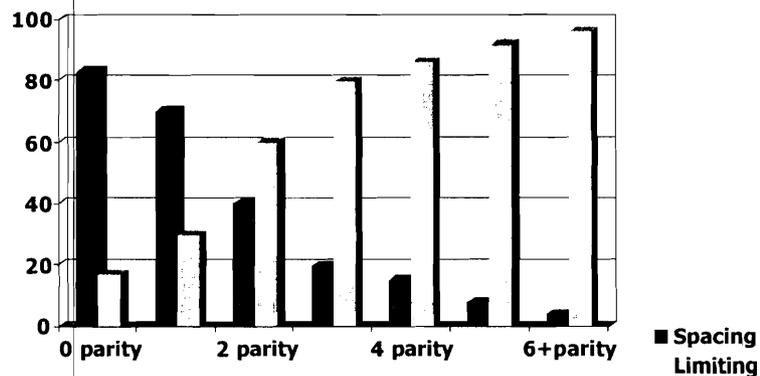
Demand and Parity

- Lower parities associated with highest portion of demand to space
- Shift from interest in spacing to interest in limiting occurs most often at parity 2
- Demand for spacing does exist among 0 parity women



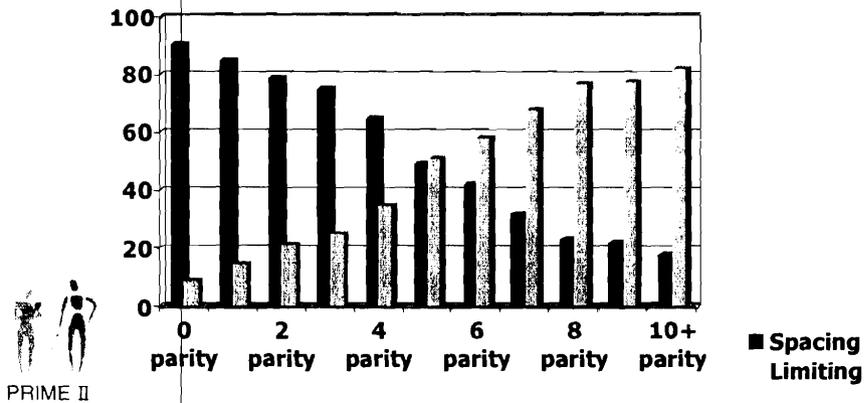
Demand for Spacing and Limiting by Parity

As portion of total FP Demand
Bolivia, 1998



Demand for Spacing and Limiting by Parity

As portion of total FP Demand
Tanzania, 1996



Summary of Parity-Specific "Cross-Over" Point at which FP Demand for Limiting exceeds that for Spacing

2 Parity (8 countries)	3 Parity (1 country)	4 Parity (1 country)	5 Parity (2 countries)	7 Parity (2 countries)	8 Parity (1 country)
-Bangladesh -Bolivia -Egypt -Ghana -Uttar Pradesh (1999) -Indonesia -Peru -Philippines	-Uttar Pradesh (1992-93)	-Kenya	-Tanzania -Zimbabwe	-Benin -Togo	-Mali



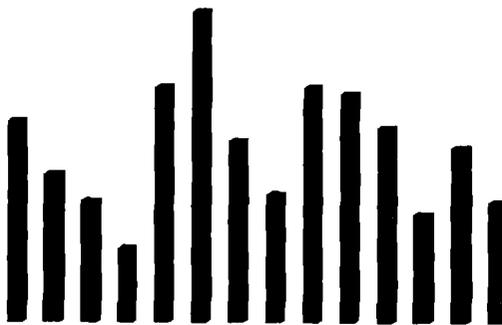
Demand, Age and Parity

- Birth-spacing is the predominant reason for levels of FP demand among younger, lower parity women
- Married, 0 parity adolescents can be a significant segment of the portion of women with a demand to space births



PRIME II

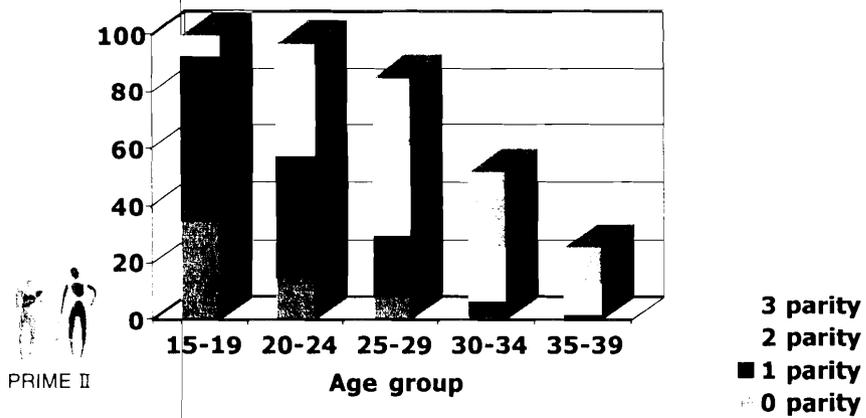
Demand for Spacing 15-20 Age Cohort, Zero Parity Women As portion of total FP Demand



PRIME II

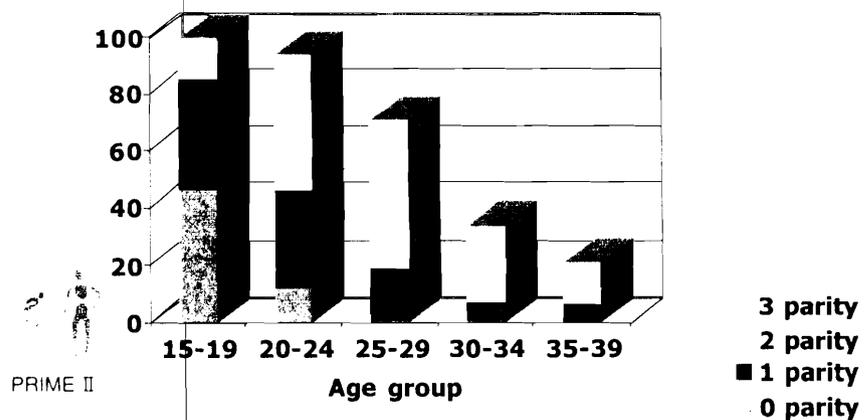
Demand for Spacing by Age Cohort and Parity

As portion of total FP Demand
Ghana, 1998



Demand for Spacing by Age Cohort and Parity

As portion of total FP Demand
Uttar Pradesh, India, 1999



Implications

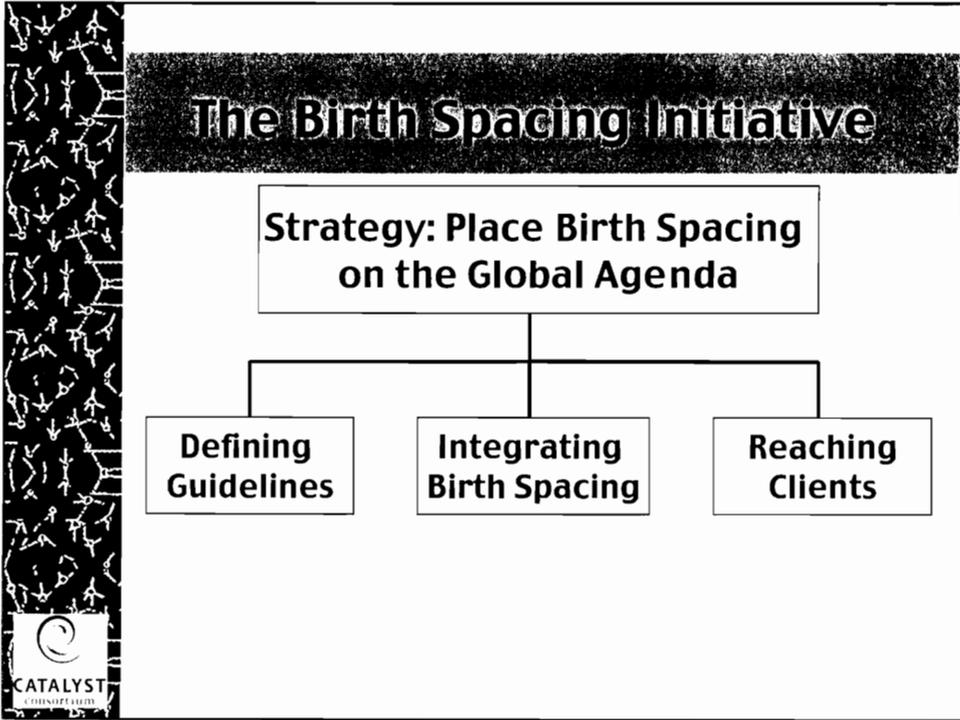
- To fully meet existing demand for birth-spacing, services and service delivery strategies need to be relevant to young, low parity women
- Specific needs of married, zero parity adolescents should be addressed



Implications

- Profile of birth-spacer: In 9 of 15 countries, a married woman under 30 years of age with less than three children





Defining Norms - Rationale

I

International organizations responsible for health programs that serve women need to learn the strong association of birth intervals of three to five years with infant/child/maternal mortality reduction

CATALYST CONSORTIUM

I. Defining Norms - Goal

**Define Birth Spacing Technical Guidelines
as Three to Five Years
from Birth to Birth**



Defining Guidelines - Objectives

- È Partner with international/multilateral organizations that define public health norms
- È Support governments in adopting the 3 - 5 yr. birth intervals guidelines
- È Develop protocols to guide MOHs and service providers in adopting 3 - 5 yr. birth interval guidelines
- È Support adoption of 3 - 5 yr. interval in delivery of public, private and commercial health care





Defining Guidelines - Strategy

È Creating Awareness

- Consensus about the definition

È Increasing Knowledge

- Conduct research
- Present and disseminate findings

È Eliciting Commitment

- National conferences in key countries
 - Support advocacy groups
- 



Defining Guidelines - Results

Over the next 4 years, CATALYST will:

È Launch Champions Groups

È Identify and conduct relevant research

È Launch conferences and workshops

È Create partnerships with UNICEF, UNFPA, PAHO, WHO





II. Strengthening Health Services- Rationale

Translate technical guidelines into public health program protocols to reach the greatest number of people through public, commercial and NGO sectors.

Tap into medical and non-medical channels, community outreach and non-traditional providers.



Integrating Birth Spacing - Goal

**Strengthening health service delivery with
Optimal Birth Spacing Programming**



Integrating Optimal Birth Spacing - Objectives

- È **Integrate optimal birth spacing programming into public, private and NGO programs**
- È **Create “ optimal birth-spacing oriented” services**
- È **Undertake provider training at the public, private and NGO levels**
- È **Involve communities in actions to support birth spacing service delivery**



Integrating Birth Spacing - Strategy

- È **Disseminate optimal birth spacing protocols and guidelines**
 - **Public Sector**
 - **Pharmaceutical Sector**
 - **NGOs**
- È **Increase Access**
- È **Develop Accreditation/Support System**
- È **Train Providers**
- È **Mobilize Gatekeepers**





Integrating Optimal Birth Spacing - Results

In the next 4 years, Catalyst and the Champions will identify countries where the initiative will be piloted.

Focus on consolidating the 3 -5yr. interval in health services in participating countries, evaluating training and accreditation components and measuring increased access to OBSI.



III. Reaching the Clients - Rationale

Impact will be measured by number of women/men who choose to space births for three-five years using methods suited to their needs.

Quality of service, personal beliefs (religious and other), social norms and lack of knowledge are major determinants of optimal birth spacing behavior.





Reaching the Client - Goal

Offer to countries/RH programs the clients' perspective which will help modify and/or adopt birth spacing behaviors



Reaching the Client - Objectives

- È **Define client knowledge, beliefs and actions regarding Birth Spacing**
- È **Determine the optimal client-provider interaction to ensure women have the best quality birth spacing service**
- È **Define the behavior messages needed to deliver effective birth spacing counseling**
- È **Produce a prototype counseling module on birth spacing**





Reaching the Client – Strategy

- È Use qualitative methods to determine knowledge, beliefs and actions regarding Birth Spacing
- È Through these studies, define key behaviors to concentrate on for maximum response
- È Create program guide prototype(s) to be used by personnel engaged in counseling
- È Produce packet of supporting counseling materials



CATALYST
COUNSELING



Reaching the Client – Strategy

- È Produce a training counseling guide
- È Monitor application of counseling
- È Document and disseminate successful interventions among all partners



CATALYST
COUNSELING

Reaching the Client - Results

In the next 4 years, CATALYST will:

- È **create a model for OBSI health service delivery based on qualitative research**
- È **evaluate the findings**
- È **disseminate the information**



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