RELATIVE EFFECTIVENESS OF CONTRACEPTIVE METHODS DURING POSTPARTUM PERIOD

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Outline

• Background
• Methodology
• Results
• Discussions
Background

• Brief history of postpartum programs
• Rationale of PPP
• Purpose of the paper
Strategy

• Consider a group of 1000 women who breastfeed their children

• Used a mathematical model to:
  – Estimate average birth intervals under four scenarios:
    1. Depend upon breastfeeding
    2. Use breastfeeding and initiate contraception immediately following child birth
    3. Use breastfeeding and initiate contraception immediately following menstruation
    4. Use breastfeeding and initiate contraception during the interval period
  – Estimate births averted under scenario 2 to 4 in comparison to scenario 1.
Strategy II

- Five methods
  - Traditional method (Withdrawal)
  - Short-term reversible modern methods (pill, Injectable and condom)
  - Long-acting reversible contraception (IUD)
- Two values of PPA: 8 and 12 months
- Five year observation period
- Median months of use and projected mean months of use
- Adjust for accidental pregnancies while breastfeeding and/or using contraception
Methodology

• Birth interval while breastfeeding but using no contraception
  – No adjustment for accidental pregnancies ($P_L$) while breastfeeding but before resuming menstruation
    • $B_0 = PPA + C + M + G$  \hspace{1cm} (1)

• Adjustment for accidental pregnancies ($P_L$) while breastfeeding but before resuming menstruation
  • $B_1 = [P_L \times B_L] + [(1-P_L) \times B_0]$  \hspace{1cm} (2)
Birth interval by breastfeeding and contraception

• \( B_i = \text{PPA} + \text{C} + \text{I} + \text{M} + \text{G} \)
  \[ = B_0 + I \quad (3) \]
• \( I = F(R-A-P \times W) \). \quad (4) \
Estimating I and B

- Contraception initiated immediately following childbirth \([F = \text{F(A)} \text{ and } A=\text{PPA}]\)
  - \(I_2 = \text{F(A)} \times [R(60) – A – \{\text{P}(60-A) + (\text{P}_L) \times \text{P(A)}\} \times W]\) \hspace{1cm} (5)
  - \(B_2 = \text{PPA} + C + I_2 + M + G = B_0 + I_2\) \hspace{1cm} (6)
- Contraception initiated following resumption of menstruation \([F=1 \text{ and } A=0]\)
  - \(I_3 = [R(60) - \text{P}(60) \times W]\) \hspace{1cm} (7)
  - \(B_3 = B_0 + I_3\) \hspace{1cm} (8)
  - \(B_4 = [\text{P}_L \times B_L] + [(1.0 - \text{P}_L) \times B_3]\) \hspace{1cm} (9)
- Contraception initiated during interval
  - \(B_5(t) = [\text{P}_L \times B_L + \text{P}(t) \times B(t) + \{(1- \text{P}_L - \text{P}(t)) \times B_3\}]\) \hspace{1cm} (12)
Proportion of Taiwanese women remaining non-pregnant while breastfeeding but before resuming menstruation
Input parameters shown in Table 2

- PPA = 8, 12; C = (1.5/f) = 7.5; M = 2; G = 9 months.
- Cumulative pregnancy and termination rates for 12, 24, and 36 months; median months of use from Ali et al. (2012)
- Other rates intra or extrapolated from these rates by using an exponential decay curve [Appendix II]
- Projected months of use estimated from annual continuation and termination rates over five years [Appendix II]

\[ R = \sum N_{T+1} + 0.5 \times \sum d_T; \quad T = 1, 2, 3, 4, 5 \]
Estimated birth interval by breastfeeding and use of contraception [PPA=12; projected months of use]

- Contraception initiated immediately following childbirth
  - Injectable: 36.5
  - Pill: 35.4
  - Withdrawal: 35.2
  - Condom: 34.4
  - IUD: 56.4

- Contraception initiated immediately following resumption of menstruation
  - Injectable: 51.4
  - Pill: 49.7
  - Withdrawal: 48.7
  - Condom: 48.9
  - IUD: 70.5
Estimating Births Averted

\[ BA = R(60) \times [(1/B_0) - (1/B_2)] \]  \hspace{1cm} (13)
Estimated births averted per 1000 women by breastfeeding and one segment (projected months of use) of contraceptive use initiated immediately following childbirth in comparison to breastfeeding alone.
Estimated births averted per 1000 women by breastfeeding and one segment (projected months of use) of contraceptive use by time of contraceptive initiation in comparison to breastfeeding alone [PPA=8 months]
Estimated births averted per 1000 women by breastfeeding and one segment of injectable use by time of its initiation in comparison to breastfeeding alone [PPA= 12 months]

Projected months of use (22.5 months)

Median months of use (11.9 months)
Conclusions

• BF and PP initiation of contraception averts more births than BF alone
• PP initiation of IUD averts more births than short term reversible methods
• Very little difference among the short term methods; injectable > Withdrawal > Pill > Condom
• Relative effectiveness of a method initiated PP depends upon:
  ▪ Length of the PPA
  ▪ Duration of use
Conclusions II

- PP initiation of contraception averts significantly fewer births than initiation of a method immediately or soon after resuming menstruation.

- The difference between the two strategies depend upon:
  - Method
  - Length of PPA
  - Duration of use
Implications

• Relative effectiveness of PP initiation of a method can be improved if
  – Women are able to use them for a longer period
  – Restart the same method or switch to another method

• Even then PP strategy would remain less superior to PR strategy
Concerns with PR strategy to promote contraceptive use following the resumption of menstruation

• Women may not come back for contraception following the resumption of menstruation
  • YES. But PP initiation is less effective than interval initiation even if women are late by a few months

• Some women may become pregnant before resuming menstruation
  • YES, But probability of conception within 12 months is about 3 percent only < 12 months pregnancy rates with pill or condom use
Best Postpartum Strategy

• Women are encouraged to:
  – Breast feed their children naturally
  » AND
  – Initiate contraception following the resumption of menstruation or the first birthday of the child whichever comes first.

• They will be exposed to a small risk of pregnancy before resuming menstruation, but then no method is perfect.
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