Innovations in indirect (and direct) estimation of abortion incidence

Elizabeth Sully, PhD

IUSSP Expert Group Meeting
Population Data for the 21st century: Advances in data collection methodologies

December 6th, 2019
The changing landscape of abortion measurement

- Abortion is difficult to measure (not only in restrictive settings)

- Increasing use of misoprostol diminishes effectiveness of facility-based methods
  - Global: Abortion Incidence Complications Method (AICM)
  - USA: Abortion Provider Census

- New indirect methods being tested
Indirect and direct methods currently being tested by the Guttmacher Institute

<table>
<thead>
<tr>
<th>Indirect methods</th>
<th>Ghana</th>
<th>Indonesia</th>
<th>Ethiopia</th>
<th>Uganda</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>AICM</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modified AICM</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>List experiment</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidante/ATPR</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Network scale-up</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

| Direct methods                          |       |           |          |        |     |
| Survey experiments (Introductions, phrasing, order etc.) |       |           |          |        | X  |
Indirect and direct methods currently being tested by the Guttmacher Institute

<table>
<thead>
<tr>
<th>Indirect methods</th>
<th>Ghana</th>
<th>Indonesia</th>
<th>Ethiopia</th>
<th>Uganda</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>AICM</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modified AICM</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>List experiment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidante/ATPR</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Network scale-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Direct methods

<table>
<thead>
<tr>
<th>Direct methods (Introductions, phrasing, order etc.)</th>
<th>Ghana</th>
<th>Indonesia</th>
<th>Ethiopia</th>
<th>Uganda</th>
<th>USA</th>
</tr>
</thead>
</table>

Social network-based measures
**Confidante Method**

**What we want to know**

The population (women aged 15-49)

**What we measure**

Surrogate sample of up to three confidantes per respondent
Network Scale-Up Method

What we want to know

The population (women aged 15-49)

What we measure

Respondent’s social network
Assumptions in using social network-based measures of abortion

1. Representativeness
   • Women’s social networks can be used to generate data representative of the general population

2. Better Reporting
   • Women know about abortions in their social networks
   • Women are willing to report on abortions in their social networks
Data sources and sample

- Abortion module added to PMA2020 Round 6 in Uganda and Ethiopia
  - Annual nationally representative survey of women
    - Uganda: 4,288 women $\rightarrow$ $\frac{1}{2}$ randomized into NSUM, $\frac{1}{2}$ randomized into confidante
    - Ethiopia: 7,546 women $\rightarrow$ $\frac{1}{2}$ randomized into NSUM, $\frac{1}{2}$ randomized into confidante
NSUM: determining social network size

- **Social tie definition**
  - How many women do you know by sight and name (and they know you) who you had contact with in the last 12 months?

- **Known population approach**
  - Each respondent is asked to report the number of people she knows who have a certain characteristic (Ex. How many women do you know who live in a household that owns a camel?)
  - Known population sizes from most recent DHS
Confidante Method: determining surrogate sample and homophily

- **Social tie definition:**
  - Think of women with whom you share intimate secrets and who share intimate secrets with you. These women should also be people with whom you have been close to for at least a year or more, are 15-49 years of age and live in Ethiopia/Uganda.

- **Asked to think about:**
  - Confidante 1 as *most likely* to share intimate secrets with her
  - Confidante 2 as *second most likely*
  - Confidante 3 as *third most likely*

- **Measure several socio-demographic characteristics**
  - Age, district/woreda, education level
Measuring abortion

- **NSUM**
  - …how many have ever done something to intentionally end a pregnancy?
  - …how many have ended a pregnancy in the past 12 months?

- **Confidante**
  - …has she ever done something to intentionally end a pregnancy?
  - In what year did this last happen?
Visibility of abortion in social networks

We assume that women do not have perfect knowledge of abortions in their social networks

- “Transmission bias”
- Likely larger in magnitude for NSUM than Confidante

Calculate visibility of abortion among women who self-report an abortion

- NSUM: How many people [social tie definition] know that you ended this pregnancy?
- Confidante: Did you discuss ending this pregnancy with [confidante name]?
Validation check

- Estimate IUD/implant use using NSUM and Confidante method

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproductive health behavior:</td>
<td>Visibility:</td>
</tr>
<tr>
<td>Information potentially shared among the same ties</td>
<td>Transmission bias adjustment may still be required</td>
</tr>
<tr>
<td>Long-acting:</td>
<td>Purpose of disclosure:</td>
</tr>
<tr>
<td>Less time-dependent than other contraceptive methods</td>
<td>Less notable of an event than abortion</td>
</tr>
</tbody>
</table>
Representativeness: NSUM

Comparing known population sizes to network scale-up estimates

Uganda

Ethiopia
Representativeness: Confidante

- Compared limited confidante socio-demographic characteristics to respondents + DHS
  - Systematic differences in both countries for age, education, and region

- Reweighted confidantes based on these differences
  - *May be different in other important ways we could not measure!!
Abortion incidence in Uganda

Incidence per 1,000 women 15-49

- Confidante, 48.6
- NSUM, 24.7
- AICM estimate, 2013*, 39.0
- Direct report, 10.5

* Prada et al., 2016
Abortion incidence in Ethiopia

Incidence per 1,000 women 15-49

- Confidante, 14.5
- NSUM, 4.7
- Direct report, 2.5
- AICM estimate, 2014*, 28.0

* Moore et al., 2016
## Transmission bias adjustment

<table>
<thead>
<tr>
<th>Method</th>
<th>Visibility of respondent's abortion</th>
<th>Correction factor (1/t)</th>
<th>Adjusted estimate (per 1,000 women)</th>
<th>Visibility of respondent's abortion</th>
<th>Correction factor (1/t)</th>
<th>Adjusted estimate (per 1,000 women)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSUM</td>
<td>5%</td>
<td>20.81</td>
<td>98.2</td>
<td>10%</td>
<td>9.89</td>
<td>244.3</td>
</tr>
<tr>
<td>Confidante*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidante 1</td>
<td>57%</td>
<td>1.88</td>
<td>32.0</td>
<td>59%</td>
<td>2.026</td>
<td>91.0</td>
</tr>
<tr>
<td>Confidante 2</td>
<td>41%</td>
<td>2.40</td>
<td></td>
<td>51%</td>
<td>1.887</td>
<td></td>
</tr>
<tr>
<td>Confidante 3</td>
<td>40%</td>
<td>1.76</td>
<td></td>
<td>47%</td>
<td>2.231</td>
<td></td>
</tr>
</tbody>
</table>

* Weighted with respondent weights

Source: Sully et al. (2019), Giorgio et al. (2019)
Barrier effects – NSUM

Degree size

Social network ties that have ever had an abortion

Uganda
Ethiopia

Reported an abortion
Did not report an abortion

Uganda
Ethiopia

Reported an abortion
Did not report an abortion
Barrier effects – Confidante

Reported zero confidantes

Confidantes who have ever had an abortion

Uganda

Ethiopia

- Reported an abortion
- Did not report an abortion

Uganda

Ethiopia

- Reported an abortion
- Did not report an abortion
Validation check: IUD/implant use in Uganda

- **Confidante:** 23.2%
- **NSUM:** 10.3%
- **Direct report:** 8.0%
- **2016 DHS:** 7.8%
Validation check: IUD/implant use in Ethiopia

- Confidante, 18%
- NSUM, 4.5%
- Direct report, 7.2%
- 2016 DHS, 7.2%
Discussion

- First comparison of multiple social network-based measures of abortion incidence
  - Variation in performance across methods and countries
    - Both methods produced lower estimates in Ethiopia
    - Higher estimates for confidante method
Representativeness assumptions

- Confidante validity checks suggest we are NOT producing an appropriate surrogate sample
  - Confidante sample systematically differed on key characteristics from respondents/DHS
  - Confidante validation test overestimated of IUD/implant use (2-3x as high) in both countries
  - ~25% of respondents reported having 0 confidantes (barrier effects)

- NSUM validity checks suggest we are accurately measuring social network sizes
  - Problem lies in reporting of abortion and transmission bias adjustment
Better reporting assumptions

- Improvement over direct reports of abortion

- Likely that women can report more information about their close confidantes
  - Able to learn more about the characteristics of women who have abortions (Methods used, where obtained, complications, etc.)

- Transmissions bias still a concern
  - Larger for NSUM than Confidante
Next Steps

- Hybrid of NSUM and Confidante may provide unique opportunity to measure abortion incidence + safety

- Fielding both methods again in 2019/2020
  - Comparing confidante and NSUM reports among the same women
  - Working on additional ways to measure transmission bias
    - More nuanced questions in PMA surveys
    - Game of Contacts in Ethiopia

- Qualitative study on abortion disclosure (who, why, when)
  - Types of disclosures (emotional vs. instrumental or informational)
Direct reports

- Question order
- Method of administration
- Framing/introduction
- Interviewer effects
- Consistency
- Comprehension
Conclusions

- Social network-based methods for measuring hidden populations are a promising approach for estimating abortion

- However, more research is needed on:
  - Abortion disclosure in social networks
  - Transmission bias
  - Impact of survey design and interviewer training
Acknowledgements

Maggie Giorgio, Ethiopia and Uganda Co-PI
Laura Lindberg, USA PI