Using Logistics Data to Estimate CPR for Short-Acting Family Planning Methods

Suzy Sacher       John Snow, Inc.       USAID | DELIVER PROJECT
5 OCTOBER 2015
Background

- Updates to CPR estimates often needed more frequently than population-based surveys can provide
- Alternative approaches for estimating CPRs are being explored
- Related work includes:
  - Linking logistics data, including at a subnational level in Rwanda
  - Showing the impact of stockouts in Malawi
  - Estimating additional CPR if no stockouts
Data Used

- Examined the relationship between public-sector:
  - logistics distribution data *(PPMR, PipeLine)*
  - CPRs *(DHS)*

- FP methods included:
Countries Included (30)
Models

- Tested **3 models** to generate country-level public sector CPR estimates:
  1. **direct** estimation through existing couple-years of protection (CYP) conversion factors
  2. **bivariate** linear regression
  3. **multivariate** linear regression
    - including historic data (previous DHS-based CPR)

- Used natural log transformations to meet the assumptions for linear regressions (due to a skewed dataset)
Association Findings

Strong, significant relationships between public-sector contraceptive logistics data and public-sector prevalence rates for short-acting methods.

→ validates quality & accuracy of logistics data
Model Accuracy Findings

Comparison of the model-generated CPRs with the DHS CPRs:

- All models except CYP-based condoms model estimated public-sector prevalence of short-acting methods to within 2 percentage points in at least 85 percent of countries
- Regression models = most accurate

<table>
<thead>
<tr>
<th>TABLE 4. Evaluation of Model Accuracy and Precision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Difference Between Model Estimates and DHS Referent Values</strong></td>
</tr>
<tr>
<td><strong>Model</strong></td>
</tr>
<tr>
<td>Injectables</td>
</tr>
<tr>
<td>Multivariate</td>
</tr>
<tr>
<td>Bivariate</td>
</tr>
<tr>
<td>CYP</td>
</tr>
<tr>
<td>Oral Contraceptives</td>
</tr>
<tr>
<td>Multivariate</td>
</tr>
<tr>
<td>Bivariate</td>
</tr>
<tr>
<td>CYP</td>
</tr>
<tr>
<td>Condoms</td>
</tr>
<tr>
<td>Multivariate</td>
</tr>
<tr>
<td>Bivariate</td>
</tr>
<tr>
<td>CYP</td>
</tr>
</tbody>
</table>
CPR Estimates for Injectable Contraceptives

Model-generated prevalence estimates were generally more accurate for injectables than for other methods.
CPR Estimates for Short-Acting Methods
(3 methods combined)

<table>
<thead>
<tr>
<th>Model-Generated CPR for Short-Acting Methods</th>
<th>Referent DHS CPR for Short-Acting Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bivariate-Estimated</td>
<td>Perfect Accuracy</td>
</tr>
<tr>
<td>Multivariate-Estimated</td>
<td></td>
</tr>
<tr>
<td>CYP-Estimated</td>
<td></td>
</tr>
</tbody>
</table>

- Bivariate-Estimated
- Multivariate-Estimated
- CYP-Estimated
- Perfect Accuracy
Limitations

- Product-specific issues (condoms)
  - May not be used immediately
  - Dual use
- Variations in logistics data available
  - Issues data
  - Forecast data
  - Dispensed-to-user data
- Small sample size
Conclusions

• Most models able to provide relatively accurate prevalence estimates

• Potential for using logistics data to provide low-cost interim CPR estimates for injectables and orals when timely survey data are unavailable

• CYP-based model is easiest to use and interpret
  \( \rightarrow \) we recommend using it for estimating national prevalence rates for injectables and orals
Future Research Recommendations

- Develop similar models for:
  - long-acting methods
  - beyond the public sector
  - at the subnational level

- Refine models when more data (and more dispensed-to-user data) become available

- Consider reexamining CYP conversion factors for condoms, and/or incorporating dual use in CYP models
Thank You

Team:
Marc Cunningham
Ariella Bock
Niquelle Brown
Suzy Sacher, ssacher@jsi.com
Benjamin Hatch
Andrew Inglis
Dana Aronovich