Policy Prescription

for Preventing Unintended Pregnancies

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Unintended Pregnancy: Implications

• **Children whose conception was unintended:** lower standardized test scores, lower levels of educational attainment, higher poverty rates, higher levels of childhood mortality, higher levels of crime

• **Mothers who have experienced an unintended pregnancy:** lower rates of labor-force participation, lower levels of educational attainment, more likely to receive public benefits

• **Most evidence:** correlational

• **Some studies:** exploit plausibly exogenous variation over time in state laws governing access to abortion and birth control. Generally reach conclusions similar to those of the more correlational studies.

• **Bottom line:** unintended pregnancy affects well-being of children, mothers, and society at large.
Policy Solutions: What do we Know?

- Literature contains credible evidence of various policies’ near-term behavioral effects (e.g., probability of using contraception, sexual initiation, coital frequency, etc.).

- But, for some interventions, few good estimates of policies’ implications for longer-term outcomes (e.g., pregnancies/births/abortions).

- Also, behavioral evidence exists in methodological/disciplinary silos; has not been synthesized to allow for “apples-to-apples” comparisons of different policies.

- This paper: takes best estimates of various policies’ behavioral effects; plugs them into simulation model of family formation; develops benefit-cost ratios for each one.

- Policy analyses: conducted using simulation model called FamilyScape.
FamilyScape: Quick Overview

- Brookings Center on Children & Families: *Developed agent-based simulation model of sexual behavior, pregnancy, family formation, child outcomes.*
- Parameters: *estimated using data from a wide range of sources.*
- Outcomes: *track real-world equivalents relatively well.*
- Model used to conduct policy analysis.
- Results discussed today:
  - *Summarized in Future of Children chapter (Fall 2010).*
  - *Documented in much more detail in a series of online technical reports & in a paper forthcoming in JPAM*
Estimating the Model’s Baseline Parameters

- **GSS/NSFG data:** used to model share of single men & women in relationships
- **NSFG data:** used to calibrate modules on sexual activity, contraceptive use
  - *contraceptive methods: sterilization, condoms, oral contraception*
- **Estimates from Royston (1982) used to impute**
  - $P(\text{pregnancy} | \text{intercourse})$
  - *function of woman’s age, day in her menstrual cycle*
- **Data from AGI, NVSS, and NSFG used to impute**
  - pregnancy outcomes
    - *abortion, miscarriage, live birth*
- **Data from CPS:** used to impute $P(\text{born into poverty})$
- **Data from various clinical studies, surveys:** used to model
gestation periods & duration of postpartum infertility
Real-World and Simulated
Pregnancy, Birth, and Abortion Rates*
Per 1,000 Unmarried Women

<table>
<thead>
<tr>
<th>Pregnancy Rates</th>
<th>Birth Rates</th>
<th>Abortion Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>88</td>
<td>43</td>
<td>34</td>
</tr>
<tr>
<td>89</td>
<td>41</td>
<td>36</td>
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*Simulated data are based on annualized averages from 50 ten-year runs of the FamilyScape simulation model.
Unintended Pregnancy: Policy Solutions

- Paper presents results from simulation analyses of three policies with potential to curb unintended pregnancies:
  - Mass-media campaign encouraging condom use
  - Pregnancy-prevention program targeted on at-risk teens
  - Expansion of Medicaid family-planning services
Unintended Pregnancy: Policy Solutions

- **Four-step policy-simulation process:**

  1) Identify policies for which there is credible evidence of their effects on key antecedent behaviors (sexual activity, contraceptive use)

  2) Synthesize evidence to develop estimate(s) of policies’ effects on sexual frequency &/or contraceptive use

  3) Model equivalent behavioral changes in FamilyScape

  4) Estimate impacts of policies by comparing outcomes under baseline and alternative parameterizations

- Key outcomes of interest in current version of model: family structure (single parenthood, teenage childbearing), child poverty, abortion

- Benefit-cost ratios estimated for each simulated policy
Policy Simulations: Evidence Used to Develop Assumptions for Policy Simulations

» Mass-media campaigns
  - Often evaluated using difference-in-differences approach w/treatment & control municipalities
  - Developed assumption of program’s cost using data on expenses of other national-level, health-related mass media campaigns

» Teen pregnancy prevention programs
  - Often evaluated using random assignment
  - Assumptions re: simulated program’s behavioral effects and cost developed by conducting synthesis of evaluation results for five programs with effects on sexual frequency and contraceptive use
  - Assumed program implemented on national scale would have more limited effects than small-scale programs included in synthesis
Policy Simulations: Evidence Used to Develop Assumptions for Policy Simulations

» Expansion of Medicaid family-planning services
  - *Kearney and Levine (2009)* analysis of effects of Medicaid family-planning waivers
  - *Triple-difference identification strategy*
  - *In simulation, assumed comparable expansions would have comparable effects in non-waiver states*
  - *Also developed estimate of cost of program using data on per-participant program expenses contained in KL*
Unintended Pregnancy: Benefit-Cost Framework

• Fiscal-Impact Approach.
  » For practical reasons, benefits & costs measured only from the perspective of the government.
Unintended Pregnancy: Benefit-Cost Framework

- Programs’ benefits measured in terms of taxpayer savings:
  » Prenatal & postpartum care
  » Cost of outcome itself (e.g., cost of delivery, medical treatment of fetal loss)
  » Medical care for newborn infants
  » Benefits/services provided to young children up to age five

- Only focused on means-tested spending on low-income women & children

- Didn’t account for other societal savings, e.g. lower crime rates

- Didn’t account for private costs/savings (e.g., higher lifetime earnings, higher levels of educational attainment, etc.).

- So, estimates are probably conservative.
Accounted for the fact that some prevented pregnancies would be delayed, others averted altogether.

Sensitivity analyses accounted for varying assumptions re:

» Policies’ costs and behavioral effects

» Share of prevented pregnancies that would result in births vs. abortions
Policy Simulations: Results

- Bottom-line findings from preferred specifications:
  - *All three policies have BC ratios < 1 if spending on children’s programs is not considered*
  - *But, all three policies have BC rations comfortably > 1 if spending on children’s programs is considered (preferred specifications: between $2 and $6)*
  - *Medicaid expansion: largest benefit-cost ratios*
  - *Teen pregnancy prevention program: most births/pregnancies prevented among teens*
Policy Simulations: Results from Preferred Specifications

Benefit-Cost Ratios for Three Evidence-Based Pregnancy-Prevention Policies

- Mass-Media Campaign: $4.31
- Teen-Pregnancy Prevention Program: $2.46
- Expansion of Medicaid Family-Planning Services: $5.62
Policy Simulations: Results

- Appendix: simulation model presents different and more precise estimates of policies’ effects than do back-of-the-envelope calculations.

- Why? FamilyScape – more sophisticated treatment of such factors as:
  - Covariance between contraceptive use & coital frequency
  - Diversity of contraceptive methods
  - Covariance between coital frequency and contraceptive use
Key Conclusions

• Obviously, uncertainty re: model’s baseline parameters; precise costs & behavioral effects for simulated policies.

• However, main findings: robust to substantial modifications in several key assumptions.

• Results from preferred specifications: all three policies would more than pay for themselves

  » Conclusion holds even though assumptions re: extent of policies’ benefits were relatively conservative.
Key Conclusions

• Policies would likely also improve outcomes for mothers and their children.

• Administration: moving in right direction.
  » E.g., health-care reform law expands Medicaid family-planning services and sets aside $ for evidence-based teen pregnancy prevention programs.
  » And new HHS regulation requires private insurance to provide birth control without cost sharing.

• Recommend maintaining/expanding policy investments of this sort.
FamilyScape: Next Steps

- Account for imperfect use by allowing for demographic variation in efficacy rates.
- Update model’s parameters using new NSFG data.
- Sync FS with rest of SGM.
- Use FS for new stand-alone and/or SGM policy simulations.
FamilyScape: Next Steps

- Jen Manlove & Amanda Berger (Child Trends): updating FS’s parameters and estimating parameters to capture variation in contraceptive efficacy by demographic characteristics.

- Demographic findings have implications in terms of whether and how public policies related to unintended pregnancies are targeted.

- Update from Manlove & Berger
Demographic Variation in Contraceptive Use and Failure

Jennifer Manlove, Ph.D.
Amanda Berger, Ph.D.
Kate Welti, M.P.P.
Contraceptive Method Failure Rates

1. Socio-demographic differences in contraceptive failure rates (% pregnant in 1st year)
   – Marital status, race/ethnicity, age
   – Predicted probability of pregnancy
   – Adjust average probability to “typical use” failure rates from Contraceptive Technology and create scalars
   – Methods: Condom, Pill, LARC

2. Examined cumulative frequencies to estimate failure rates for poor, moderate, and good users
Condom Failure Rates Vary by Subgroup

Married


Unmarried

- White Hispanic: Under 25: 20%, 25-29: 13%, 30+: 10%
- White: Under 25: 31%, 25-29: 20%, 30+: 10%

Child Trends
Pill Failure Rates Vary by Subgroup

Under 25 | 25-29 | 30+
---|---|---
**Married**
White Black Hispanic | 15% | 14% | 9%
White Black Hispanic | 13% | 8% | 5%
White Black Hispanic | 8% | 9% | 8%

**Unmarried**
White Black Hispanic | 13% | 12% | 5%
White Black Hispanic | 7% | 12% | 8%
White Black Hispanic | 8% | 8% | 8%
LARC Failure Rates Vary by Subgroup

<table>
<thead>
<tr>
<th></th>
<th>Married</th>
<th>Unmarried</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>1%</td>
<td>3%</td>
</tr>
<tr>
<td>Black</td>
<td>3%</td>
<td>7%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Estimated Failure Rates for Poor, Moderate and Good Users

<table>
<thead>
<tr>
<th>Contraceptive Method Failure Rates</th>
<th>Poor Use (Upper 25th Percentile)</th>
<th>Moderate Use (Median)</th>
<th>Good Use (Lower 25th Percentile)</th>
<th>Perfect Use*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condom</td>
<td>19.9%</td>
<td>13.0%</td>
<td>7.2%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Pill</td>
<td>8.2%</td>
<td>7.9%</td>
<td>5.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td>LARC</td>
<td>3.2%</td>
<td>2.5%</td>
<td>1.2%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

FamilyScape: Next Steps

- Kris Moore & Nicole Steward-Streng (Child Trends): interesting analysis of which birth characteristics/circumstances are most predictive of success in early childhood.

- Will use results of this analysis to beef up the “back end” of FS and link it to the ECM.

- Update from Moore & Steward-Streng.
What Constitutes a Strong Start for Babies?

Kristin A. Moore, Ph.D.
Nicole R. Steward-Streng, M.A.
Paula Daneri, B.A.
Purpose

• To develop a brief index of a strong start in life for a baby, using variables that are well-measured, widely available, and malleable, and that predict better child development.
Potential Independent Variables

• Education
• Age at Birth
• Pregnancy Intentions
• Poverty Status
• Family Structure
• Relationship Happiness
• Substance Use
Approach

• Create 3-category variables
  • Education (0=high school degree or less, 1=some college, 2=college graduate or more)
• Bivariate analyses with child outcomes
  • Behavior
  • Cognitive
  • Health Measures
• Multivariate analyses of individual variables on child outcomes
• Analyses of varied indices on child outcomes
• Selection and creation of recommended index
Data

Early Childhood Longitudinal Study – Birth Cohort (ECLS-B), a longitudinal study of approximately 10,700 children born in 2001. We restrict our sample to the approximately 6,200 children at 60 months whose resident biological mothers answered the nine-month parent survey and who had a valid sample weight.

- 9-month interview for “strong start” independent variables
- 48- & 60-month variables for child development measures
Potential Strong Start Measures

- **Education of mother/better-educated parent**
  0=high school degree or less, 1=some college, 2=college degree or more

- **Mother’s age at first birth/birth of the focal child**
  0=19 or younger, 1=20-24, 2=25 or older

- **Pregnancy intentions of both parents, mother/mother and father reports**
  0=unwanted by both parents, 1=wanted by one, 2=wanted by both parents

- **Family income**
  0=<100% FPL, 1=100-184% FPL, 2=>=185% FPL

- **Welfare receipt**
  0=two or more forms of aid, 1=one form of aid, 2=no aid

- **Union status of biological parents at birth and nine months/at birth**
  0=other/no union, 1=cohabiting, 2=married

- **Relationship happiness**
  0=not too happy, 1=fairly happy, 2=very happy

- **Relationship happiness and conflict between parents**
  0=not happy and argues OR fairly happy and argues about two or more issues, 1=else, 2=very happy and does not argue often

- **Substance use during pregnancy**
  0=a lot of smoking or drinking, 1=some of either, 2=no smoking or drinking
ECLS-B Child Development Measures

• Behavior
  • Social Skills (parent report)
  • Learning-Related Behaviors (teacher report)
  • Externalizing Behaviors (parent report)
  • Externalizing Behaviors (teacher report)

• Cognitive
  • IRT Reading Score (child assessment)
  • IRT Math Score (child assessment)

• Health
  • Overall Health (parent report)
  • BMI-Measured Weight Risk (child assessment)
  • Any Hospitalization (parent report)
Findings

• All potential independent variables were significant and generally associated with our child outcomes
  • Bivariate
  • Multivariate
  • Exception is intendedness in multivariate analyses

• Some variables are stronger and more consistently related to child outcomes
  • Age at first birth vs. age at focal birth

• Some variables are more available in surveys
  • Union status vs. relationship happiness

• Some variables are better measures
  • Parent education vs. substance use during pregnancy

• Some variables have greater face validity
  • Income vs. food stamps, housing, or TANF
Therefore, we chose . . .

**Education of mother**
- 0 = high school degree or less
- 1 = some college
- 2 = college degree or more

**Mother’s age at first birth**
- 0 = 19 or younger
- 1 = 20-24
- 2 = 25 or older

**Family income**
- 0 = less than 100% FPL
- 1 = 100-184% FPL
- 2 = 185% FPL or more

**Union status of biological parents at birth**
- 0 = other/no union
- 1 = cohabiting
- 2 = married
The 8-Category Index of a Strong Start is Well-Distributed
Learning-Related Behaviors, Teacher Report (Range=-0.8 – 4.4), Improve as Scores on the Strong Start Index Increase
Externalizing Behaviors, Teacher Report (Range=1–5), Decline as Scores on the Strong Start Index Increase
IRT Reading Scores (Range=-1.8 – 3.1), Improve as Scores on the Strong Start Index Increase
IRT Math Scores (Range=-1.4 – 3.1), Improve as Scores on the Strong Start Index Increase
The Proportion of Children with Excellent Health Increases as Scores on the Strong Start Index Increase
Implications

- An indicator of child well-being
- A parameter for a microsimulation model

What if...

*Scores moved from 0 to 1?*

*All scores (except 8) increase by 1?*

*Scores of 0 to 3 increase by 1?*
FamilyScape: Next Steps

- New FS tasks: well-aligned with the SGP’s overarching goal of looking at life-course implications of targeted interventions carried out at different points in time.

- Look forward to continuing to work with CT & the SGP team to get the “3.0 version” of the model up/running new policy simulations.
Comments/Questions Welcome...