Full Length Research Paper

The role of mass media campaigns in preventing unintended pregnancy

Adam Thomas

Georgetown University, McCourt School of Public Policy, 412 Old North, 37th & O Streets NW, Washington, DC 20057, U.S.A.

This short paper discusses the potential of advertising campaigns to reduce rates of unintended pregnancy in the United States. The author did a review research indicating that past campaigns encouraging contraceptive use have affected the behavior of some members of their target populations, and presented simulation results suggesting that a publicly funded, nationwide campaign has the potential to reduce by more than 20,000 the number of children born into poverty each year, to save taxpayers substantially more money than is required to fund the campaign, and to effect meaningful reductions in rates of teenage pregnancy, non-marital childbearing, and abortion.

Key words: Media campaigns, contraception, unintended pregnancy.

INTRODUCTION

In recent years, policymakers in the United States have expanded the reach of evidence-based "teen pregnancy prevention programs" that are designed to reduce the rate of pregnancy among teenagers. Rigorous evaluations have found many of these programs to be effective at achieving this goal (Sawhill et al., 2010; Thomas, 2012). However, because most teens are in school while most young adults are not, it is much more difficult to reach members of the latter group than of the former group via these sorts of place-based interventions. Media campaigns, on the other hand, have the potential to reach a broad cross-section of the sexually active population. In this short paper, the contributions that media campaigns have made and can continue to make in the ongoing effort to reduce the prevalence of unplanned pregnancy among teens and young adults alike are discussed.

It begins by briefly reviewing social scientific evidence accumulated over the last several years on the effects of past media campaigns encouraging safer sexual behavior, and then summarizes the results of an analysis that incorporates this evidence into a cutting-edge micro-simulation model. Unlike other studies of media cam-paigns related to reproductive health, this work also produces benefit-cost ratios that compare the simulated campaign's costs with the savings that it would produce for the taxpayers who fund it. The findings suggest that a well-designed, publicly funded campaign has the potential to reduce the incidence of nonmarital and teenage preg-nancy, lower the number of children born into poverty, and generate a net savings to taxpayers.

LITERATURE REVIEW

In recent decades, media campaigns have been under-taken to address any number of different public health problems. The specific behaviors targeted by these cam-paigns have ranged from seat-belt use to drug abuse. Some of these campaigns have focused specifically on encouraging safer sexual behavior, and most such campaigns have encouraged the use of condoms in particular as a means of avoiding contraction of sexually transmitted infections. In a widely cited meta-analysis of evaluations of health-related campaigns, Snyder et al.

(2004) conclude that campaigns encouraging condom use affected the behavior of about six percent of the members of the relevant target population, on average. This estimated effect size is roughly comparable to the one reported by Zimmerman et al. (2007), who evaluated a media campaign encouraging condom use in Lexington, Kentucky. The results reported by Zimmerman and his coauthors suggest that the Lexington campaign increased condom use by a little more than six percent among members of the campaign's target population.

However, the studies cited above use methodologies that are, out of necessity, imperfect. They tend to compare changes in condom use over time between a locality (or localities) in which a media campaign was implemented and a demographically similar locality (or localities) in which it was not. It is possible that these studies' "treatment" cities are not as similar as one might hope to the "control" cities to which they are matched. In theory, any such dissimilarities could have caused these studies to overstate the effects of the media campaigns in question. Moreover, Noar (2006) notes that Snyder and her coauthors only consider the results of published papers, which are presumably more likely than unpublished papers to have reported evidence of a measurable effect. For both of these reasons, the author agrees with Noar that the true effects of campaigns of this sort may be as small as half the size suggested by the literature cited above.

SIMULATION METHODOLOGY

Taken as a whole, the studies described in the previous section might be taken to suggest, conservatively, that a typical media campaign encouraging condom use affects the behavior of about three percent of the members of the campaign's target population. One might consider this to be a small effect – so small, in fact, as to imply that campaigns of this sort may not be worthwhile investments of government funds. This work presents a set of simulation results suggesting quite the opposite. Specifically, it simulates the effects of implementing a nationwide publicly funded advertising campaign encouraging condom use. It projects the effects of such a campaign using FamilyScape, a microsimulation tool developed at the Brookings Institution that allows the user to model the impacts of policy changes on family-formation outcomes. FamilyScape simulates the key antecedents of pregnancy (i.e., sexual activity, contraceptive use, and female fecundity) and many of its most important outcomes (e.g., pregnancy, childbearing, and abortion within and outside of marriage and among teenaged and non-teenaged women).

Figure 1 shows FamilyScape's overall structure and delineates the various stages of the simulation. During the first stage, the model is populated with a group of individuals aged 15 to 44 whose demographic characteristics are nationally representative. In the second stage, opposite-sex relationships of varying duration are formed among some individuals. In the third stage, sexual activity (or a lack thereof) is simulated among married and unmarried couples, and contraceptive use (or a lack thereof) is simulated among couples who have sex. In the fourth stage, some sexually active couples become pregnant, and each pregnancy eventually results in a birth, an abortion, or a fetal loss (i.e., a miscarriage). The model's fifth and final stage accounts for the fact that each birth is either to a married couple or to a single mother. As a function of

the structure of the family into which each child is born and of his or her mother's demographic characteristics, a poverty status is also assigned to each newborn child during the model's final stage.

All of the model's input dynamics are aligned to real-world benchmarks that were produced via analysis of a wide range of external data sources. FamilyScape is also designed to produce demographic variation in these dynamics that is similar to the equivalent variation that is observed in the real world. The model generally does a good job of replicating real-world outcomes of interest, especially for the unmarried population. For instance, the real-world pregnancy rate among unmarried women is only about 1 percent higher than the simulated rate of pregnancy for the same group. FamilyScape lends itself readily to policy simulations, since its parameters can be changed relatively easily under the assumption that a given intervention has an effect on individual behavior. As an example, if one believes that a policy has a particular effect on contraceptive use, that effect can be simulated at the individual level by altering the model's baseline behavioral parameters, and the policy's impacts can then be estimated on (say) the number of teenage pregnancies, the rate of out-of-wedlock childbearing, the incidence of abortion, and so forth.

Like most simulation models, FamilyScape relies heavily on random variation. As the simulation proceeds, various random processes govern the pool of potential partners with whom a given individual might enter into a new relationship, the probability that he or she will in fact enter into a relationship, the likelihood that a given married or unmarried couple will have sex on a given day, the probability that a couple will use contraception when they have sex, and so forth. Thus, no two runs of the model are exactly alike. The simulation results described here were therefore generated using data that are averaged over multiple runs of the model. Specifically, the results reported here are for 50 ten-year simulation runs. In other words, each time that a simulation is performed, the model is first allowed to reach a steady state, and outcomes are then tracked for ten full years of analysis time. This process is repeated 50 times to produce 500 years' worth of data. This approach allows one to "average out" random variation across years (since, for example, the simulation may produce a slightly different rate of pregnancy in the fourth year of a given run of the model than in the fifth year) and across runs (since the random values used to initialize the model and to govern the way that the simulation unfolds differ slightly from run to run). See Thomas and Monea (2009) for further information on the architecture of the FamilyScape simulation model.

For the purposes of the simulation described here, it is assumed, based on the literature discussed in the previous section, that the campaign would cause three percent of men to use condoms who would not otherwise have done so (it is also assumed for the sake of simplicity that the campaign has no effect on the behavior of married men). Previous studies of the impacts of media campaigns encouraging condom use have focused exclusively on those campaign's effects on contraceptive behavior. Among the unique contributions of this study are the fact that the author simulates the effects of this campaign on critically important "second-order" outcomes such as rates of abortion and nonmarital childbearing and the fact that he estimates a benefit-cost ratio for the simulated intervention. He measures the campaign's benefits in terms of taxpayer savings on Medicaid and other means-tested programs serving pregnant women, mothers, and children. In other words, some pregnancies are costly to taxpayers because, as a result of the pregnancy having occurred, the woman and her newborn child (if the pregnancy results in a birth) will claim taxpayer-funded benefits and services. The estimates of the campaign's benefits, then, are driven by the amount that taxpayers would save when such pregnancies are prevented. These taxpayer-savings estimates account for government spending on pregnant women and on children up to age five; and they are adjusted to reflect the fact that some prevented pregnancies will simply be delayed whereas others
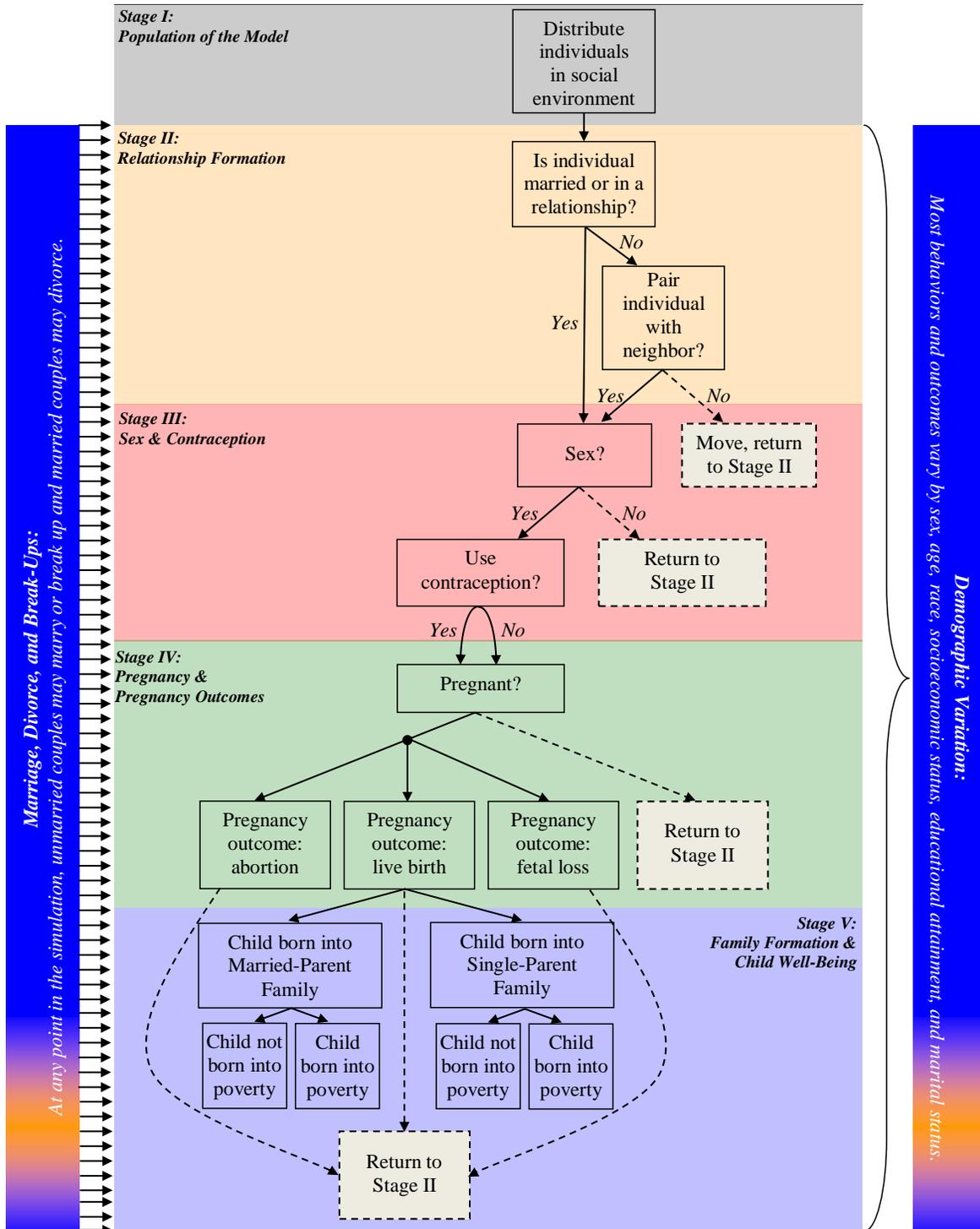
Figure 1. Summary Diagram of FamilyScape Simulation Model.

will be averted altogether. See Thomas (2012) and Monea and Thomas (2011) for additional information on the way that these savings estimates were developed.

It is assumed that the simulated campaign would be implemented on a national scale and, because there is good evidence to suggest that a campaign's persistence has implications for its effectiveness

(see, for example, Zimmerman et al., 2007), it is also assumed that it would be maintained year-round. The author develops a set of assumptions regarding the annual cost of a nationwide, year-round media campaign of this sort using information on the costs of other nationally implemented, health-related media campaigns. Specifically, he uses data on the American Legacy Foundation's *Truth*

Table 1. Estimated annual costs, intensity, and effectiveness of four mass media campaigns.

Campaign	Estimated cost expressed on an annualized and nationalized basis	Estimated campaign intensity (GRPs per week)	Campaign estimated to be effective?
Truth	$100 million	117	Yes
VERB	$60 million	147	Yes
NYAMC	$230 million	254	No
Lexington Condom Campaign	$295 million	> 200	Yes

Table 2. Estimated effects and costs of a simulated nationwide mass media campaign.

Outcome	Low-cost assumption	High-cost assumption
Percent Reduction in Teen Pregnancies	4.0	
Percent Reduction in Out-of-Wedlock Births	2.5	
Percent Reduction in the Number of Children Born Into Poverty	2.2	
Percent Reduction in the Number Abortions	3.9	
Estimated Annual Program Cost	$100 million	$250 million
Cost per Pregnancy Avoided	$900	$2,300
Cost per Birth Avoided	$2,500	$6,300
Estimated Annual Taxpayer Savings Produced by the Campaign	$431 million	
Benefit-Cost Ratio	4.3	1.7

Campaign, the Centers for Disease Control's *VERB* campaign, the Office of National Drug Control Policy's *National Youth Anti-Drug Media Campaign* (NYADMC), and the Lexington condom campaign described in the previous section. The first three campaigns were implemented nationwide, and itemized data on the Lexington campaign's expenditures were used to develop an assumption about what such a campaign might cost of it were taken to scale nationally.

Table 1 reports the estimates of the average annual costs of each of these four campaigns. The author also reports estimates of each campaign's intensity, as reflected in its targeted gross-point rating (GRP) per week (in general, a GRP measures the sum of ratings points per spot for a given television advertisement over a particular period of time). In addition, Table 1 indicates whether the bulk of the evaluations for each campaign found it to have been effective. The *Truth* and *VERB* campaigns' estimated annual costs are quite a bit lower than are those of the NYADMC and Lexington campaigns. This cost differential mirrors (and is almost certainly a function of) the higher intensity of the latter two campaigns. Given that these data paint two rather different portraits of the cost of such a campaign, two different assumptions for the policy simulation regarding the campaign's cost are made. For the initial specification, it is assumed that the campaign would cost $100 million annually and, in an alternative specification, that it would cost $250 annually. It is not, however, assumed that the campaign's effectiveness varies with its cost, since – as can be seen in the table – relatively more-expensive campaigns are not necessarily more effective. See Thomas (2011) for more information on the development of the cost assumptions used in these simulations.

RESULTS

Table 2 reports results from the simulation of the effects of a publicly funded, nationwide, year-round media campaign encouraging condom use. The results presented in Table 2 indicate that the simulated campaign would reduce the number of teen pregnancies and the number of abortions by about four percent and would reduce nonmarital childbearing and the number of children born into poverty by more than two percent. The 2.2 percent reduction in the number of children born into poverty corresponds to about 23,000 fewer poor newborn children each year.

The bottom portion of the table reports cost-effectiveness and cost-benefit estimates for the simulated campaign. These estimates vary depending upon whether one assumes that the campaign would cost $100 or $250 million per year. Under the former assumption, the cost per avoided pregnancy would be $900; the cost per avoided birth would be $2,500; and the program's benefit-cost ratio would be 4.3. This benefit-cost ratio suggests that taxpayers would save $4.30 for every dollar that the government spends on the program. If one assumes that the program would cost $250 million annually, the cost per avoided pregnancy would be $2,300; the cost per avoided birth would be $6,300; and taxpayers would save $1.70 for every dollar that is spent on the program. The benefit-cost ratios reported here are in the same general ballpark as comparable ratios for related policies simulated using FamilyScape, including a nationally implemented evidence-based sex teen pregnancy prevention program and an expansion in states' Medicaid family planning programs. Moreover, because

the simulated media campaign has the ability to reach a large number people relatively cheaply, it is found that its costs per pregnancy and birth averted are generally lower than are those of these other programs. See Thomas (2012) for more information on all three simulations.

DISCUSSION

In sum, the literature reviewed here suggests that mass media campaigns in the United States have made meaningful contributions to the effort to reduce the incidence of unprotected sex. The simulation results presented in Table 2 further suggest that future campaigns have the potential to make additional and important contributions to this effort and – perhaps just as significantly – to provide taxpayers with a solid return on investment. For example, the simulation results indicate that a nationwide, government-funded, year-round media campaign encouraging condom use could reduce by more than 20,000 the number of children born into poverty each year and save taxpayers between $1.70 and $4.30 for every dollar that they spend.

It is also important to note that these estimates were produced using a reasonably conservative set of behavioral assumptions. For example, the cost-savings estimates account only for taxpayer savings associated with the prevention of unplanned pregnancy – they do not account for potential private benefits in the form of higher lifetime earnings or increased academic attainment on the part of mothers. Nor do the estimates account for the possibility that the simulated campaign might reduce the incidence of unintended pregnancy among married couples in particular. Thus, the true societal cost-savings produced by a campaign such as the one simulated here might in fact be larger than is suggested by the estimates.

Overall, the evidence reviewed in this short paper implies that the investment of additional government resources on advertising campaigns encouraging contraceptive use has the potential to reduce the incidence of nonmarital and unintended childbearing, teen pregnancy, and abortion. The achievement of these goals would, in turn, produce public- sector savings. Especially given the mounting fiscal pressures facing policymakers in the United States, these findings suggest that implementation of media campaigns designed to improve contraceptive use would be smart public policy.

REFERENCES

Monea E, Thomas A (2011). "Unintended Pregnancy and Taxpayer Spending." Perspectives on Sexual and Reproductive Health 43:88-93.

Noar SA (2006). "A 10-Year Retrospective of Research in Health Mass Media Campaigns: Where do we go from Here?" J. Health Commun. 11:21-42.

Sawhill I, Thomas A, Monea E (2010). "An Ounce of Prevention: Policy Prescriptions for Reducing the Prevalence of Fragile Families." The Future of Children 20:133-155.

Snyder LB, Mark AH, Elizabeth WM, James K-T, Fran F-M, Dwayne P (2004).   "A Meta-Analysis of Mediated Health Communication Campaigns on Behavior Change in the United States." J. Health Commun. 9:71-96.

Thomas A (2011). Estimating the Effects and Costs of Three Pregnancy-Prevention Programs. Brookings Institution Center on Children and Families Working Paper.

Thomas A (2012). "Three Strategies to Prevent Unintended Pregnancy." J. Policy Anal. Manage. 31:280-311.

Thomas A, Monea E (2009). FamilyScape: A Simulation Model of Family Formation. Brookings Institution Center on Children and Families Working Paper.

Zimmerman RS, Philip MP, Seth MN, Mia Liza AL, Hung-Yi L, Mary LH (2007).   "Effects of a Televised Two-City Safer Sex Mass Media Campaign Targeting High-Sensation-Seeking and Impulsive-Decision-Making Young Adults." Health Educ. Behav. 34:810-826.