

Communication, normative influence and the sustainability of health behavior over time:

A multilevel analysis of contraceptive use in Indonesia, 1997-2003

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Introduction

In spite of accelerating attention to the relationship between communication and social norms, there are still significant gaps in how we explicate and measure normative concepts (Yanovitsky & Rimal, 2006). Key distinctions are beginning to emerge, such as that between group-level collective versus individual-level perceived norms (Lapinski & Rimal, 2005) and between types of perceived norms, e.g., descriptive norms (perceptions of what behaviors are typically performed) versus injunctive norms (perceptions of what behaviors are typically approved or disapproved) (Cialdini, 2003). Yanovitsky & Rimal (2006) rightly call for more research on how these two constructs and levels are related.

This paper seeks, first, to explicate the collective dimension of norms and how it is related to individual behavioral choices. Specifically, we make a distinction between collective behavioral norms and collective attitudinal norms, a distinction that we suggest is analogous to that between descriptive norms and injunctive norms at the individual level. Furthermore, we suggest that communication also has normative aspects at the collective level, reflected in the ubiquity of information that is exchanged within a group. We examine prevalence of message exposure and spousal communication at the collective level, as part of the mechanism through which collective behavioral and attitudinal norms form, change and affect decisions at the individual level. We test these propositions using multilevel analysis of nationally representative data about contraceptive behavior over a five year period in Indonesia.

Communication and contraception

It is well-documented that adoption of family planning methods results in fertility decline, but the causes of contraceptive adoption and continued use are vigorously debated (Montgomery & Casterline, 1996). Classical demographic transition theory (Teitelbaum, 1984; Wrigley, 1969) argues in favor of socioeconomic and structural factors such as declining economic value of children and increased education (Bongaarts, 2003) over social psychological factors such as communication and attitude change. However, historical evidence from European countries (Coale & Watkins, 1986; Hirschman, 1994) shows that fertility decline spread from one region to another with similar language or culture even when the latter region was less developed (Coale & Watkins, 1986). Conversely, Tolnay (1995) explained persistently high fertility levels in the American South before 1940 as a function of high fertility in adjacent counties, even after controlling for a variety of structural and cultural variables. Cleland and Wilson's (1987) "iconoclastic view"—that fertility decline was the result of social interaction and ideational (i.e., social cognitive) change rather than socioeconomic progress—challenged the field of demography to examine this possibility. Montgomery and Casterline (1996) carried the line of reasoning further, applying aspects of social learning and social influence theory to explain fertility changes.

While resistance to social psychological explanations of fertility change persists in the field of demography, communication scholars have been testing the effects of social cognition and social influence on contraceptive use since the early 1970s (Rogers, 1973). Numerous studies have found effects of social influence on contraceptive use decisions, including spouse approval of contraception, discussion of family planning with one's spouse and with others, and subjective norms surrounding family planning (see, for example, Kim & Lee, 1973; Piotrow, Kincaid, Rimon & Rinehart, 1997; Storey, Boulay, Karki, Heckert & Karmacharya, 1999; and

Kincaid, 2000). Even so, the mechanism by which *societal* shifts in behavior occur and are sustained is still a matter of debate in the field of communication. For example, international reviews of mass media and fertility studies (Hornik & McAnany, 2001, 2002) have raised questions about how and to what extent existing data allow us to attribute changes in fertility to individual level effects of communication, in particular mass communication. Hornik and McAnany examined the evidence for a variety of paths to change in fertility and concluded that communication programs, consisting of “multiple channels, providing reinforcing messages, over time, producing interpersonal discussion and a slow change in values, and *working at a level of social aggregation higher than the individual*” (2002:234-235, emphasis ours) may exert important influence on individual ideation and behavior. Their call for greater attention to longer term and social level effects of communication suggests the need for a focus on collective norms.

Normative influence on family planning

Social norms are the perceived standards of attitudes and behaviors prevalent among members of a community (Perkins & Berkowitz, 1986). The power that norms exert over behavior stems from various sources, including the desire for social support and positive self-image (Sherif, 1935; Cialdini, 1993; Cialdini & Goldstein, 2004) and the desire to avoid social sanctions (Bendor & Swistak, 2001). Hogg & Reid (2006) view the acquisition of normative beliefs through the lens of social identity theory (Tajfel & Turner, 1979; Turner et al., 1987), arguing that perceived norms are derived from collective norms through the exchange of information within groups. Through this exchange, social actors reach conclusions about the prevalence of and support for behaviors or beliefs within a group to which they feel affinity, such that those characteristics of the group become linked with self identity, thereby influencing behavioral decisions.

Perceived norms tend to operate within social subsystems where the prevalence of behaviors is most readily observable and regularly reinforced. Kincaid (2004) calls this “bounded normative influence” (BNI) or “the tendency of social norms to influence behavior within relatively bounded local subgroups of a social system rather than the system as a whole” (2004:38). Communication plays an essential role in the BNI process, because social networks consist of “interconnected individuals linked by patterned flows of information” (Rogers & Kincaid, 1981). Social networks are themselves composed of sub-networks or cliques, within which the links and interactions are more dense and frequent, and within which more uniform information is exchanged, compared to the social network as a whole. More intensive flow of less varied information within the subsystem results in convergence of knowledge, attitudes, values, and behaviors, and to differentiation between the subsystem and the larger social system as a whole (Kincaid, 2004).

For the current study, we focus on collective (Lapinski & Rimal, 2005) or group norms, which Hogg & Reid (2006:7) define as “regularities in attitudes and behavior that characterize a social group and differentiate it from other groups.” However, we make explicit the distinction between collective *attitudinal* norms (group regularities in attitudes or preferences) and collective *behavioral* norms (group regularities in behavior). We infer these regularities in behavior and attitudes by aggregating across individual reports to calculate the objective prevalence of these phenomena within groups. Note that we are not concerned in this study with individual perceptions of the normative environment, but with the objective prevalence of behaviors and attitudes at the group level.

The mechanism by which objective prevalence of behaviors and attitudes become known and incorporated into behavioral decision-making processes is, of course, communication. Many

aspects of this relationship have been examined in the literature, but two recent studies have particular relevance to our work here. Boer & Westhoff (2006) found that weak ties communication (Granovetter, 1973) was more likely associated with the dissemination of knowledge about normative conditions, while strong ties communication was more likely associated with conformity to normative influence. Although their study focused only on interpersonal communication networks, it suggests potentially different roles for face-to-face (stronger ties) communication—with one's spouse, for example—compared to mass mediated (weaker ties) communication.

Another recent study by David, Capella & Fishbein (2006) found that vocal minorities could, at least in group discussion settings, sway a majority to adapt non-normative attitudes. This suggests a number of important questions about the effects of congruence and incongruence in the normative world. For example, under what conditions can a normative (collective) behavior be undermined by non-normative (collective) attitudes? When collective behaviors and collective attitudes are at odds, which will prevail?

The Indonesian context

Historically, Indonesia has had one of the world's most successful family planning programs (Ford & Siregar, 1998; Shiffman, 2004; United Nations, 2005). Since its creation in 1970, the supraministerial National Family Planning Coordinating Board (known by its Indonesian acronym, BKKBN) has spearheaded efforts to make contraceptive methods accessible to Indonesian families and to promote a small family norm with the slogan, "*Dua anak cukup*" ("Two children are enough") (State Ministry for Population, 1996). Almost non-stop national and local campaigns over 30 years contributed to a rapid increase in the contraceptive prevalence rate (CPR) from 26 percent in 1971 to 60 percent in 2003, and to a drop

in the total fertility rate (TFR) from 5.6 to 2.6 average number of births in a woman's lifetime during the same period (BPS & ORC Macro, 2003).

Since its inception, Indonesia's population program has been heavily dependent on government subsidies and contributions from foreign donors. These subsidies have been justified for many years by the general view among program managers and researchers alike that poorer users of a particular contraceptive method would drop out of the system if prices rise and they are unable to switch to an alternative, less costly method, resulting in an overall decline in CPR (Jensen, Kak, Satjawinata, Wirawan, Nanjoy & Supoyoko, 1993). Just such a decline was anticipated as a result of the economic crisis that hit Indonesia and the rest of Asia hard beginning in 1997. Currency values plunged, foreign investments withdrew, businesses failed, unemployment soared, household income dropped, and government budgets for social services and development were redirected into crisis management. As if the economic crisis were not enough, the 30-year Suharto regime ended, adding political uncertainty and civil service disruption to that country's woes. With 210 million people, one of the highest population densities in the world, and a projected increase of 50 million additional people over the next 25 years (Ross, 2003), Indonesia scarcely could afford increased birth rates..

Surprisingly, the disaster never happened. Several studies showed that CPR continued to rise during the worst period of the crisis. Frankenberg, Sikoki and Suriastini (2003) found no significant changes in either level of prevalence or in the mix of methods chosen by Indonesian contraceptive users. Data from the 2003 national Demographic and Health Survey (BPS & ORC Macro, 2003) indicate that as free-of-cost methods became less available in the public sector, women simply switched to the private medical sector. The 2002 National Socioeconomic Survey (SUSENAS) (Biro Pusat Statistik, 2002) also confirmed the trend.

Hypotheses

Do normative forces help to explain this resilience? Following the suggestion of Lapinski & Rimal (2005) and Yanovitsky & Rimal (2006), we make a distinction between collective behavioral norms, defined in this case as the prevalence of contraceptive behavior within bounded social groups, and collective attitudinal norms, defined as the prevalence of preference for small family size. We also examine prevalence of communication at the group level, specifically message exposure and spouse communication, as part of the mechanism through which collective behavioral and attitudinal norms affect behavioral decisions at the individual level. Using longitudinal data, we first examine the effects of these collective variables on change in contraceptive prevalence at the group level. We then combine group level variables with individual level variables (demographic characteristics, parity, exposure to family planning messages, communication with one's spouse and ideal family size) to assess the impact of collective norms on individual contraceptive use.

First, we hypothesize that contraceptive use at the group level would remain stable due to entrenched social norms favoring family planning and communication around those norms—in other words, a supportive normative environment—reflected in factors such as interpersonal communication between spouses, approval of family planning and desire for small families at the aggregate level. Second, we hypothesize that the prevalence of exposure to family planning messages in the symbolic environment, measured as message exposure also at the aggregate level, reinforces the small family and contraceptive use norms, thus contributing to the stability of contraceptive use.

The purpose of this paper is to describe and test a conceptual framework that explains this resilience of CPR. The proposed mechanism is the influence of social norms and

communication at the county level that make contraceptive use relatively constant even in an environment in which the supply and costs of contraceptives change drastically. While contraceptive use at the individual level will always involve some instability due to couples starting and stopping use as their fertility needs change, we propose that the degree to which contraceptive prevalence remains stable at the aggregate level is a function of normative momentum that keeps bringing new users into the system, reduces contraceptive discontinuation by reinforcing the behavior of current users, and brings at least some dropouts back into the system. Further, we posit that there exists a normative threshold beyond which contraceptive choice is less subject to particular pro- or anti-natalist norms and more subject to the contraceptive choices of adjacent influential others.

Our main research questions are as follows:

Research question 1: Was CPR more likely to be stable between 1997 and 2002 in areas where social norms favored smaller families?

Research question 2: Did social norms measured at the aggregate level affect individual use of contraception?

Research question 3: To what extent did exposure to family planning messages through mass media and interpersonal communication influence the decision to use contraceptives?

Based on the above questions, we propose the following hypotheses:

Hypothesis 1: The more widespread the small family norm and the higher the initial CPR in a given county, the more stable its CPR will remain.

Hypothesis 2: In counties where small family norms are stronger, women will be more likely to use modern contraceptives, even when controlling for individual preferences and socio-demographic characteristic.

Hypothesis 3: Beyond the influence of social norms, having a supportive symbolic environment (higher prevalence of family planning message exposure and higher prevalence of spousal communication at the county level), will be associated with higher likelihood of individual contraceptive use.

Methods

Our primary data sources are the consecutive 1997 and 2003 Indonesia Demographic and Health Surveys (IDHS), from which we derive our measures of social norms. Our community-level unit of analysis is the sub-administrative unit called the *Kabupaten*, roughly equivalent to a peri-urban county in the United States. The percentages of individuals presenting certain behavior patterns or expressing certain opinions constitute our indicators of social norms within that county. Our individual-level units of analysis are currently married women of reproductive age, 15-49 years old.

Both surveys used independent multistage random samples of households. Sample sizes were large (1997 $n = 28,810$, 2003 $n = 29,483$) to allow population estimates representative at the province level. The 1997 and 2003 surveys used the same sampling methodology but different sampling frames, because they were based on the 1990 and 2000 census tracts, respectively. Even so, a total of 238 out of 440 counties were included in both samples, making it possible to compare contraceptive use patterns across this panel of counties at two points in time that conveniently span the worst period of political and economic instability in Indonesia. Although IDHS sampled different clusters in each county in 1997 and 2003, we assume that the

clusters sampled within a given county are interchangeable because in both surveys each cluster had an equal probability of selection, and households within each cluster were subject to the same set of potential selection and instrumentation biases.

We treat these counties as proxies for bounded social networks. Even though residents in a given county may have little or no direct contact with one another, our hypotheses are based on the assumption that they share similar values and aspirations and are subject to similar socio-cultural and normative influences. Since the county sample consists of census enumeration areas that cluster households close to each other, it is also reasonable to assume that within a county there are frequent instances of respondents having direct contact with one another. Counties vary greatly in size and population density. Less populous counties may have 200,000 to 300,000 inhabitants while the largest, mostly on the island of Java, may have two million or more. Land area of counties ranges from 300 to 1200 square miles. By way of comparison, Baltimore County in Maryland, which stretches about 35 miles from the Pennsylvania border to the upper Chesapeake Bay has a population of 754,000 in a space of roughly 600 square miles.

From the two IDHS surveys we derived two data subsets for our analysis. One data set contains the counties as units of analysis. County-level variables were created by aggregating individual data into means and proportions at the county level. This data set contains 238 cases, each representing a county at two points in time.

The second data set combines a selected set of 1997 county-level variables with the 2003 IDHS individual level data set for married women residing in counties included in both surveys. The individual respondents in this data set are 21,777 currently married women 15-49 years old

from the 2003 IDHS survey.¹ This number is smaller than the original IDHS 2003 data set (n=29,483) because only women residing in counties that were sampled in both surveys were included in the data set. We excluded women not currently married from this analysis because the main variable of interest is current contraceptive use, which is negligible among non-married women in Indonesia.

All variables for analysis were constructed from standard DHS variables. Modern contraceptive users are women currently using oral contraceptives, IUDs, injectables, condoms, implants, or sterilization. In this paper we refer to modern CPR (or simply CPR), as the percentage of women currently using one of these methods. At the aggregate level, we group counties into those with a CPR of 50 percent or more (High CPR) and those with a CPR below 50 percent (Low CPR).

Exposure to family planning-related messages was operationalized as recall of messages from broadcast or print media or interpersonal communication with health workers during the six months preceding the survey. There were no nation-wide campaigns encouraging contraceptive use or promoting small families during the reference period, so message recall most likely reflects exposure to commercial advertisements or to local family planning promotions by regional BKKBN offices. For some of the analyses, we grouped counties into those with less than 33 percent of residents reporting exposure to family planning messages from one or more of those sources (Low exposure), between 33 percent and 65 percent exposed (Medium exposure) and between 66 percent and 100 percent exposed (High exposure). We used the proportion of county respondents who reported discussion of family planning with one's spouse within the six months prior to the survey to group counties into those in which less than 33 percent of residents

¹ One stratum containing only one Primary Sampling Unit (PSU) was excluded from the analysis because our analysis requires fitting statistical models to complex survey data and that can only be done for strata with at least

discussed family planning (Low discussion), between 33 percent and 65 percent discussed it (Medium discussion) and between 66 percent and 100 percent discussed it (High discussion).

The measure of ideal number of children is obtained from the question, “If you could choose exactly the number of children to have, how many would that be?” We classified respondents into three categories: those who give non-numeric answers such as, “it’s up to God” or “it depends on my husband;” those whose ideal family size is two children or less; and those whose ideal family size is three or more children. We selected two children or less as the threshold point because this represents the point of replacement-level fertility and is the family size that the Indonesian government promoted for many years with their “Two children are enough” campaign.

At the aggregate level, we group counties according to the proportion of women whose ideal family size is two or less in the county. Some analyses split this variable at the median to create High versus Low support for the small family norm, while other analyses use a tercile split (High, Medium and Low support). Using these aggregated variables in the county-level analysis allowed us to control for the interaction effects of initial CPR and initial normative support for the small family norm on relative change in CPR between 1997 and 2003.

Individual socioeconomic status represents a respondent’s level of material wealth, based on the physical condition of her dwelling and the material possessions in her household. The “wealth index” is calculated by first assigning a value of 1 to households that have a given item and a value of 0 to households that do not have the item. The items tallied are household assets, such as electricity, television, piped water and other household possessions and amenities. Secondly, a factor score is calculated for each item using principal components analysis and the resulting asset scores are standardized in relation to a normal distribution with a mean of zero

two PSUs. This stratum had 26 respondents in 2002.

and a standard deviation of one. The sum of these scores becomes the household wealth index, representing a weighted sum of the household assets, which is ascribed to all respondents living in a given household. To create a socioeconomic scale, we divided respondents into three categories: the extremely poor (Lower SES), the moderately poor (Moderate SES) and the better-off (Higher SES) using these standard wealth index scores.

To remove any possibility of overlap between individual and county level measures, all aggregated county variables are non-self means or proportions, calculated for each individual case separately. The non-self measures for a given individual respondent are obtained by calculating aggregate measures for the county, not counting that particular individual.

In the following section of the paper, we describe the specific analyses that were conducted using these county-level and individual-level measures to test our hypotheses and the results of those tests.

Results

Community level analyses

We present the results of analysis in two sections with the community level analyses (Hypotheses 1 and 2) first, followed by the individual and mixed-level analysis (Hypothesis 3).

Hypothesis 1: Stability of contraceptive use

Figure 1 plots each county according to its CPR among currently married women aged 15-49 years, in 1997 and 2003. Also shown is the smoothed regression curve² representing the overall trend in CPR and the diagonal representing a hypothetical constant in CPR in 1997 and 2003. Counties above this diagonal experienced an increase in modern CPR from 1997 to 2003, while counties below the line experienced a decrease. The overall picture is one of relative

stability but, contrary to expectations, there are numerous examples of high CPR counties in 1997 that experienced a drop in CPR by 2003. A certain amount of regression toward the mean is to be expected, with low CPR counties having nowhere to go but up and high CPR counties having nowhere to go but down. But regression toward the mean is only part of the story.

Examination of 1997-2002 CPR difference scores reveals that of the 238 counties under study, 36 percent remained within 0.5 percentage points of their initial 1997 CPR, 39 percent increased by 0.5 percentage points or more, and 25 percent declined by 0.5 percentage points or more. Figure 2 further illustrates this pattern by plotting the county CPR difference scores between 1997 and 2003 against the initial CPR in 1997. Counties with lower initial CPR, while more likely to experience a positive change, as indicated by the section of the regression line with y-coordinates greater than zero, are also more volatile, as indicated by the greater vertical spread in the scatter plot at lower levels of initial CPR. Above an initial CPR of about 40 to 50 percent, change is less dramatic, as indicated by the more limited vertical spread of the scatter plot. While the slight downward slope of the regression line indicates the tendency for CPR to decline in counties where CPR is initially high, difference scores for counties above 50 percent initial CPR range between +/- 1 percentage point, supporting the general proposition that CPR is more stable where family planning has become the norm.

To test the hypothesized role of small family norms in these changes, we grouped counties into four categories according to whether the CPR was initially high or low (more than or less than 50 percent) and whether or not there was majority support (more than or less than 50 percent) for the small family norm. Thus, counties fell into one of four categories:

² The local regression smoothing (Lowess) follows these steps for each data point: a) it computes the regression weights for each data point in the span, b) it performs a weighted linear least squares regression using a first degree polynomial and c) the smoothed value is given by the weighted regression on the predictor value of interest.

1. High initial CPR and high normative support for small families³
2. High initial CPR and low normative support for small families
3. Low initial CPR and high normative support for small families
4. Low initial CPR and low normative support for small families

Table 1 shows the relative change in county CPR between 1997 and 2003,⁴ for the counties in each category. The results confirm and further clarify the findings shown in Figure 2. Row totals show that counties with high initial CPR (50 percent or more) experienced an average CPR decline of 1.5 percent while counties with initial low CPR (below 50 percent) experienced an average CPR gain of 19.4 percent. But this regression toward the mean is strongly affected by cluster norms favoring smaller or larger families. Counties with initially high CPR but with low normative support for small families experienced an average decline of 10.4 percent, while those with high normative support for small families experienced an average CPR gain of 1 percent. Even more strikingly, counties with initially low CPR and low support for the small family norm experienced an average CPR gain of 5.1 percent, while those with low initial CPR and high normative support for small families experienced an average CPR gain of 30.1 percent. In other words, where practices and norms were congruent, change was negligible; where practices and norms were incongruent, change occurred in the direction of the normative pressures.

Hypothesis 2: Influence of the normative environment on CPR increase

Do other factors at the county-level—communication variables, in particular—help explain CPR stability and change? The analysis shown in Table 2 corroborates and elaborates on the effect of family planning and small family norms by adding two community-level

³ This cutoff point is very close to the 50.8 median for modern CPR in 1997. In other words, half the counties in 1997 have a modern CPR of less than 50.8 percent and the other half's CPR was above 50.8 percent.

communication variables, namely county-level exposure to family planning messages (Low, Medium and High) and county-level spousal communication about family planning (Low, Medium and High). As indicated in the previous section, exposure to family planning messages was operationalized as the proportion of women in a county who reported having seen or heard any family planning messages in the past six months. Spousal communication was operationalized as the proportion of women in a county who reported talking with their spouse about family planning in the past 6 months. Both are conceptualized to represent the prominence of family planning information in the symbolic environment.

For this multiple logistic regression we dichotomized the dependent variable, mean relative CPR change, into counties that remained unchanged or experienced a positive change (relative change ≥ 0) and counties that had a negative change (relative change < 0). Following the previous analysis, Table 2 shows that counties that started with high CPR and majority support for the small family norm were 2.6 times as likely to maintain or increase their CPR, compared to counties that started with a high CPR but with only minority support for the small family norm (reference category). The odds of CPR increase are even more striking in counties with low initial CPR but majority support for the small family norm: they were 8.2 times as likely to maintain or increase their CPR compared to the reference category. Whatever the initial CPR, counties where the small family norm was more widespread were more likely to maintain or increase their CPR.

County-level exposure to family planning messages and county-level spousal communication were also included in this logistic regression model. Counties with high exposure

⁴ The relative CPR change is calculated with the formula $r = \frac{CPR_{2002} - CPR_{1997}}{CPR_{1997}}$

to family planning messages were 2.5 times as likely to have maintained or increased their CPR compared to counties where exposure to family planning messages was low. The proportion of women in the county reporting spouse communication about family planning was not significantly related to change in CPR, although the odds ratios show a trend in the hypothesized direction, perhaps because interpersonal communication between husband and wife is not as publicly visible as mass mediated messages, and therefore does not appreciably affect the symbolic environment. This partially supports the hypothesis that a supportive symbolic environment would be associated with increased use of modern contraceptives.

As control variables, we also included in this model the relative change in the proportion of women using health facilities, as a proxy for access to and use of, the health system and mean age among women in the sample. Results show that counties where health service utilization increased also saw a significant increase in CPR, although causality could run in either direction. Mean age of women in the county was also significantly related to CPR, but in a negative direction, indicating that counties with an older female population were less likely to maintain or increase their CPR.

Individual level analysis

Hypothesis 3: Effect of norms and supportive symbolic environment on individual contraceptive use

In this section we examine the effect of county-level and individual-level factors on individual use of modern contraceptives. For this analysis we used the STATA *svy* command, a statistical procedure that fits statistical models for complex survey data and takes into account the multilevel sample design and weighting used by the Indonesian DHS. The use of this

command makes it statistically valid to include both aggregate and individual data in a single regression model.

Table 3 shows the results of a multivariate logistic regression in which the dependent measure is use of a modern contraceptive and the independent measures are a combination of individual and county-level variables. As explained in the methodology section, the county-level indicators are non-self means and proportions to ensure that the dependent variable is not auto-correlated with the aggregate independent variables.

County-level variables in this analysis were the proportion of women who support the small family norm (Low, Medium and High) and proportion of women whose spouse approves of family planning (Low, Medium and High). These reflect normative attitudes toward family size and the use of family planning to achieve fertility goals, measured at the county level. Individual level predictors were exposure to family planning-related messages (None, One or Two, based on the number of sources from which messages were recalled) and individual preferences about family size (non-numeric response, three or more, two or less). Control variables included individual socioeconomic status (Lower, Moderate and Higher, using the wealth index described earlier), area of residence (urban or rural), age, and number of living children, all variables typically associated with contraceptive practice.

Three models were tested: one using individual control variables only, one including individual level predictors plus controls, and one including both individual level and county level predictors plus controls. Results are shown in Table 3. Model I indicates that only moderate and higher socioeconomic status and number of living children affect individual contraceptive practice, all positively. People of higher socioeconomic status are more than twice as likely to practice family planning.

When individual exposure to family planning messages and desired family size are added in Model II, odds ratios indicate that the effect of socioeconomic status is somewhat moderated. Exposure to family planning messages are significantly related to the likelihood of contraceptive use and there is evidence of a dose effect: those who reported only one message source were 1.5 times as likely to use contraception as the reference category, while those reporting more than one source were almost twice as likely to use contraception. Desire for smaller families is also positively related to family planning practice. Those who want one or two children are almost 2.5 times as likely to practice contraception compared to those who say things like, “God will decide how many children I have.”

The addition of county-level normative influence variables in Model III further moderates (but does not eliminate) the effect of individual socioeconomic status. Rural residence and younger age continue to be significant predictors, as do individual level family planning message exposure and individual level desire for smaller family size. But county-level support for the small family norm is also significant in a positive direction, as is county-level spousal approval of family planning use. In counties where one-third to two-thirds of women support the small family norm, individual women were 1.5 times more likely to practice contraception. Where support was above two-thirds, women were twice as likely to use contraception. Similarly, where spouse approval was high (90 percent or more) women were 1.5 times more likely to use family planning compared to counties where spouse approval was weaker.

Overall, the results in Table 3 support Hypothesis 3 and the notion that the norms prevailing in the immediate symbolic environment have a positive influence on a woman’s adoption of modern contraception.

The fact that the county-level and individual-level ideal family size remain significantly correlated to contraceptive use in a multivariate regression, while being statistically independent of each other suggest that their influence is cumulative. The cumulative effect of these two variables can be seen in Table 4. On one extreme are women who expressed non-numeric (or fatalistic) answers to the question of ideal family size and who live in counties with low normative support for small family sizes. Only 21 percent of these women use modern contraceptives. On the opposite extreme we find women whose ideal family size is small and who live in counties with majority support for small families. Sixty-seven percent of these women use modern contraceptives.

Discussion and conclusions

This study represents an effort to measure complex social phenomena—social norms and exposure to health messages—that shape the symbolic environment within which individuals make decisions that affect their personal health and that of their families. Support was found for the hypotheses that normative pressures measured at the aggregate level influence individual behavioral decisions around family planning. Both negative and positive normative pressures were evident, with behavior largely conforming to the direction of the pressure. This effect was most pronounced when descriptive norms (CPR) were discordant with injunctive norms (preference for small families). Furthermore, we found support for the notion that a supportive symbolic environment, also measured at the aggregate level as population level exposure to family planning messages, has a significant impact on women's decision to adopt or continue contraceptive use.

We chose to test these notions under rather extreme conditions—the political and economic turmoil that occurred in Indonesia between 1997 and 2003—and found that social

influences and the symbolic environment appear to be potent forces even when other normally supportive social conditions are in flux. The more widespread the small family norm was in an area, the more likely it was for its CPR to remain unchanged during times of crisis. Contrary to our expectations, we did not find support for hypothesized effects of spouse communication at the aggregate level, perhaps because—unlike mass mediated health messages—interpersonal communication between a husband and wife in the privacy of their home about a private matter is less publicly visible and thus does not affect the public symbolic environment. At the individual level, we found support for the notion that regardless of individual preferences and socioeconomic characteristics, women living in areas where the small family norm predominates were significantly more likely to use modern contraception.

We did find a significant correlation between individual level message exposure and contraceptive use, but the correlation was weaker than we had anticipated. One possible explanation is that Indonesia has not had a national campaign promoting small families or contraceptive use since the mid-1990s. Family planning communication campaigns have played only a marginal role in Indonesia over the last decade, mainly because policy makers and program managers assume that approval of family planning and the acceptance of the “two children only” norm is widespread across the country. The fact that lack of normative support for small families can undercut existing contraceptive prevalence disproves that assumption. There are numerous communities where the majority of its members have not adopted the small family norm, and women residing in such communities seem to be more reluctant to use contraception, regardless of what their own preferences are. Interventions aimed at identifying and reaching such communities with messages promoting small families are likely to increase contraceptive

use. This in turn would accelerate the process of reaching replacement-level fertility, the primary goal of Indonesia population policy.

More broadly, the implication of this study for communication campaigns around the world is that attempts to increase normative support for specific health behaviors or to increase awareness of positive norms when they already exist are likely to bear fruit in the form of increased health behavior adoption and greater stability in healthy practices once they begin to take hold. If, on the other hand, low normative support for healthy behaviors is allowed to persist or high normative support is allowed to erode, then gains in healthy behavior are unlikely to occur.

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Table 1:

Percentage point change in county CPR mean 1997-2003, by CPR and ideal family size in 1997

CPR in 1997	Normative support for small family size in 1997			N
	LOW	HIGH	Total	
LOW	5.1	30.1	19.4	107
HIGH	- 10.4	1.0	- 1.5	131
Total	0.9	11.9	7.9	238
N	75	163	238	

Note. Source: IDHS 1997 and 2003

F = 8.1, p < 0.001

Table 2:

Odds ratios from multivariate logistic regression analysis of county-level variables on the likelihood of a county-level increase in modern contraceptive prevalence, 1997-2003

Variables	Percent	Odds ratios N = 238
Levels of 1997 CPR ^a and normative support for small family size ^b		
HIGH CPR – LOW Normative Support	12.2	1.00
HIGH CPR – HIGH Normative Support	42.9	2.58 *
LOW CPR – LOW Normative Support	19.3	5.37 **
LOW CPR – HIGH Normative Support	25.6	8.17 ***
Proportion of women exposed to FP messages ^c		
LOW (ref)	25.2	1.00
MEDIUM	56.3	1.73
HIGH	18.5	2.47 *
Proportion who discussed family planning with spouse ^d		
LOW (ref)	13.0	1.00
MEDIUM	69.3	1.13
HIGH	17.7	1.65
Relative change in proportion using health facilities	-	1.55 *
Mean age	-	0.77 **
Model statistics		
F-value	-	39.9
p	-	0.001

Notes.

^aLevel of CPR: LOW < 50 percent, HIGH ≥ 50 percent

^b Level of support for having only 1-2 children: LOW < 50 percent, HIGH ≥ 50 percent ≤=>=>=

^c Level of reported exposure to family planning messages: LOW < 33 percent, MEDIUM = 33 to 66 percent, HIGH > 66 percent

^d Level of spousal discussion about family planning: LOW < 33 percent, MEDIUM = 33 to 66 percent, HIGH > 66 percent

Source: IDHS 1997 and 2003

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3:

Odds ratios from multivariate logistic regression on modern contraceptive use by selected individual and county-level variables

Variables	Model I	Model II	Model III
Individual control variables			
Individual socioeconomic status			
Lower (ref)	1.00	1.00	1.00
Moderate	1.57 ***	1.50 ***	1.35 ***
Higher	2.24 ***	1.95 ***	1.67 ***
Age	0.95	0.96 ***	0.95 ***
Area of residence			
Urban (ref)	1.00	1.00	1.00
Rural	1.16	1.17 *	1.19 *
Number of living children	1.21 ***	1.31 ***	1.33 ***
Individual independent variables			
Individual exposure to family planning messages			
Not exposed (ref)	-	1.00	1.00
Exposed to only one source	-	1.50 ***	1.13 ***
Exposed to more than one source	-	1.95 ***	1.27 ***
Individual ideal family size			
Non-numeric response (ref)	-	1.00	1.00
Three or more children	-	1.51 ***	1.68 *
One or Two children	-	2.47 ***	2.46 ***
County-level independent variables			
County non-self proportion of women whose ideal family size is ≤ 2			
Less than 33% (ref)	-	-	1.00
33% to 66%	-	-	1.53 ***
67% to 100%	-	-	2.16 ***
County non-self proportion of women whose spouses approve of FP			
Less than 80% (ref)	-	-	1.00
80% - 89%	-	-	1.20 *
90% or more	-	-	1.52 ***
Model F-value	36.1	45.1	34.6
Model p	<0.001	<0.001	<0.001

Note. Source IDHS 1997 and 2003

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4

Percentage of married women using modern contraceptives by county and individual ideal number of children in 2002

Individual ideal family size	County's proportion of women whose ideal family size is 2 or less			Total	N
	< 33%	33% - 66%	67% – 100%		
Non-numeric response	20.5	42.5	50.0	44.5	2,944
Three or more	43.5	53.5	63.9	55,0	9,850
Two or less	56.1	61.5	66.6	63.7	9,009
Total	43.5	55.1	63.5	57.4	21,803
N	1,694	15,251	4,858	21,803	

Note. Source: IDHS 1997 and 2003



