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Information and Behavioral Responses with More than One Agent: The Case of Domestic Violence Awareness Campaigns

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Abstract

Behavioral interventions often provide information to help improve outcomes and many focus on settings with only one decision maker. We explore the case where two agents have opposed goals and show that information campaigns worsen outcomes. Using exogenous variation in the intensity of nationwide awareness campaigns to reduce violence against women in Peru, we show that these efforts led to more violence including more killings of women. An increase in the controlling behaviors of husbands during those months is identified as a possible mechanism. These findings question the efficacy of such campaigns on the short-term reduction of violence.

Keywords: domestic violence, health information, backlash

1. Introduction

Violence against women is a worldwide problem and has being identified a major challenge to global public health by the World Health Organization. While there are supply-side policies that have focused of the provision of services after a violent episode (e.g., Agüero, 2013 and Kavanaugh et al, 2018), much less is known about the role that prevention plays in reducing this type of violence. In particular, we know very little about the role that information and awareness campaigns have on future violence, especially in the context of developing countries where supply-side interventions are more limited (e.g., Ellsberg et al, 2015). The goal of this paper is to address this gap in the literature by focusing on the role of awareness campaigns related to intimate partner violence in Peru, a country where almost 70 percent of women have experienced such violence.[1]

For many health behaviors, the provision of information assumes that there is only one decision maker[2] or when there are more actors, one of them is silent in the decision process as in the case of mothers and children (e.g., Busso et al 2015). In those studies, the provision of information is likely to generate Pareto-improving outcomes. Some agents win but no agent is worse off. However, in the context of intimate partner violence (IPV), there are two agents with opposing and conflicting views. In this case, providing information about the rights and protections under the law for one agent almost implies describing the negative behavior of the partner and in many cases to go against social norms or roles. Indeed, these policies could lead to more violence among partners. Thus, it is not obvious information and awareness campaigns in this context would generate a Pareto-improving outcome.

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[1] This refers to ever experiencing physical, emotional, or sexual violence from their current partner for women aged 15 to 49 at the time of the survey.
[2] See Dupas (2011) for a summary of recent papers on the role of information on health behaviors in the context of developing countries.

We show that awareness campaigns are associated with an increase in IPV using quasi-experimental evidence from Peru. To address the possible endogeneity problems arising from the timing of awareness campaigns, we note that these events are triggered by international observance days. In particular, we show a surge during the months of March and November. The former is related to International Women's Day, a United Nations observance on March 8 to raise awareness about women issues. The latter arises from the International Day for the Elimination of Violence against, also proposed by the United Nations and observed on November 25. During those months there is an increase of 50 percent in the number of national awareness campaigns organized by the Peruvian Ministry of Women and Vulnerable Populations (MIMP), the government institution in charge of designing the policies to address this type of violence. We find a stronger increase concentrated on November (59%) compared to March (34%). As detailed in section 3, these international observances days are not related to Peruvian events and therefore serve as plausible exogenous sources of variation for the implementation of awareness campaigns.

In that regard, our paper is related to Jacobsen and Jacobsen (2011) who explores the awareness campaigns created the National Breast Cancer Awareness Month in the United States, where it was established October of 1985. The authors take advantage of having data before and after NBCAM was created to employ a difference in difference approach to evaluate the impact of the observance month on the number of breast cancer diagnoses. In our paper, the observance days employed were neither established by nor related to the country of study (Peru) so we use them as instruments for the campaigns organized by the government This allows us to extend the analysis of the health impact of observance days, a topic that has not received enough scrutiny in the literature of public health (Purtle and Roman, 2015). By relying on instrumental variables,

our approach also offers a methodological alternative for the case where there are no data before the implementation of the observance days.[3]

Using this instrumental variable approach, we find that the awareness campaigns increase the demand for knowledge of IPV-related issues. Using data from Google searches originated in Peru, we document increases in the searches for words related to each observance day: "women" for March and "violence against women" in November. A placebo test using searches for the word "mother" validates our identification strategy: the campaigns have no effect on searches for this word, which peaks in May due to Mothers Day.

The awareness campaigns, as triggered by the observance days, led to an increase in IPV as measured by reports and calls to a national helpline. For the former we found an elasticity of 0.12 that is statistically significant at the one percent and an elasticity of 0.32 for the latter.

The surge in reporting reflects a true increase in violent acts as opposed to just an increase of reporting past incidents. To prove this claim, we obtained data on IPV-related visits to health clinics administered by the Ministry of Health, via a Freedom of Information Act request. These visits are more likely to be driven by current acts of violence than by past events. We show that more campaigns are associated with more health visits related to IPV. To reinforce our findings, when considering clinic visits for child abuse, an important issue but not covered by the awareness campaigns, we found a negative (and statistically not different from zero) link with the awareness campaigns. Furthermore, we show that these campaigns are associated with an *increase* in femicides: the killing of women by their partners. The elasticity on this outcome ranges from 0.44 to 0.63.

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[3] The MIMP was created in 1999 the year when the UN established the observance for violence against women and many years after the 1975 creation of International Women's Day.

Consistent with the literature from social marketing and psychology, we provide suggestive evidence that a key mechanism is a behavioral change in the attitudes of the male partners in response to these campaigns. Using micro-level data, we show that husbands and partners interviewed in March and November exhibit more controlling behaviors. After accounting for several characteristics that could be correlated with the month of interview, there is an increase during those months in the probability the he is jealous when she talks to other men, that he accuses her of being unfaithful, that he restricts contacts with her family and friends and that he demands to know where she is at all times.

The rest of the paper is organized in six additional sections. Section two provides a brief review of the literature on health communications and why it is possible for massive information programs, such the awareness campaigns about IPV, to backfire and create more violence against women. Background information on the observance days and the campaigns is presented in section three and provides evidence that these days are plausible instruments for the awareness campaigns in Peru. Section four describes the data sources and econometric methods. The main results are shown in section five followed by the exploration of the mechanisms in section six. Section seven presents the policy implications of our findings and concludes.

2. Information provision in the context of violence

Borrowing from the public health field, there is a growing number of interventions focusing on preventive policies regarding IPV (Wolfe and Jaffe, 1999). For instance, social marketing campaigns try to educate the public about the severity of the issue and availability of resources (Keller, et al, 2010). However, this literature has documented unintended consequences of health communications (Cho and Salmon, 2007). This could take place because designers control the

message not outcomes (Schramm, 1961), there is no or less feedback with mass communication, unlike interpersonal settings (Westley and MacLean, 1957).

Keller et al (2010) expand this analysis and present a typology of possible unintended effects of health communication strategies such as awareness campaigns about IPV. For example, recipients of the information could react by denial (e.g., assuming that the problem is not a "big deal") or reactance (e.g., they could think there are being manipulated and so they ignore the message). These campaigns tend to assume that individuals have the tools and the knowledge on how to change their behavior. However, when individuals realize they do not have the needed abilities to change, it could make them experience more psychological distress. Messages could also reinforce "stigmas among those who were in favor of the status quo, and possibly antagonizing those who perceived the campaign as anti-male" (p. 55). Finally, those who cannot adapt could become marginalized and turn even more negative.

Furthermore, unlike the bulk of the public health policies about information provision, campaigns about IPV involve two agents who have conflicting goals. Thus, providing women with information about her rights, where to report the aggressor and asking perpetrators to seek help could have two effects. It could clearly reduce her costs of reporting while at the same time it could alter (improve) her bargaining power within the household. Both of these scenarios could lead to further violence as well, reinforcing the predictions from social marketing.

For example, Keller et al (2010) find that a college campaign moved male attitudes in the opposite direction (more negative) compared to women. Keller and Honea (2015) argues that men's negative views appear to come from "male resistance to messaging that portrays men as perpetrators and women as victims." (p. 193). As shown in the next section, the awareness

campaigns organized in Peru are oriented in an analogous direction and tend to show men as violent.

3. Background on international observance days and awareness campaigns

This section describes the origin of the two international observance days used in this paper as well as the awareness campaigns organized by the Peru's MIMP regarding intimate personal violence. The key conclusion is that these observance days serve as exogenous sources of variation for the awareness campaigns.

International observance days

The United Nations (UN) observes designated days throughout the year. These observances are created with the goal to promote international awareness and action on the issues covered by these days.[4] The majority of observances have been established by resolutions of the United Nations General Assembly. The full list of observance days are available in the UN website (http://www.un.org/en/sections/observances/international-days/index.html) and have been summarize in Figure A1 in the appendix. Here we focus on two observances that relate to women's issues.

International Women's Day is observed on March 8. It was established in 1975 (International Women's Year). The date was selected because of the 1917 protest and strike for "Bread and Peace" organized by women in Russia. These events took place on the last Sunday in

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[4] Observances are not limited to days. There are also weeks, year and decades. For a complete list of these observances visit: http://www.un.org/en/sections/observances/united-nations-observances/index.html.

February, which corresponds to March 8 in the Gregorian calendar. Days later, the Czar abdicated and the provisional government granted women the right to vote.

The International Day for the Elimination of Violence against Women is observed on November 25. It was established in 1999 by the UN Assembly General Resolution A/RES/54/134. The text *invites* governments and other institutions to "organize on that day activities designed to raise public awareness of the problem of violence against women." Since 1981, this day was marked by women activists as a day against violence and it serves to remember the brutal assassination of the three Mirabal sisters, political activists in the Dominican Republic, on orders of Rafael Trujillo in 1960. Thus, it is clear that in both cases the reasons leading to the observance of those days are not related to events in Peru and as such represent an exogenous source of variation.

Awareness campaigns about intimate partner violence in Peru

Peru's *Minsiterio de la Mujer y Poblaciones Vulnerables* (Ministry of Women and Vulnerable Populations, MIMP) is the government institution in charge of the policies associated with intimate partner violence as well as domestic violence. To do so, the MIMP created the National Program Against Sexual and Domestic Violence (*Programa Nacional Contra la Violencia Familiar y Sexual*) with the goal to reduce the high prevalence of domestic violence against women, girls and adolescents. Two key inputs towards this goal are prevention programs and the creation of information and management of the knowledge.

To achieve its mandate, the Program takes advantage of the observance days to organize campaigns looking to "sensitize the population and unified actions to face this problem [IPV]

seeking the participation of different sectors of the society."[5] Additionally, these campaigns seek to:

> "…make evident the existence of discriminatory situations and to make visible the discriminatory nature of social practices that consider women as their partner's 'property;' promoting society's participation in the questioning of the social beliefs and imaginary that tolerate, transmit, justify and reinforce discriminatory situations; incentivizing the change in attitudes and involving men to reflect on the benefits of engaging with the equality of men and women."
> [Extract taken from the 2014 International Women's Day campaign. Translated by the author.]

In Appendix Figures 2, we provide screenshots for recent campaigns' websites organized by the MIMP.

4. Data and methodology

Data sources

There are four data sources in this paper. First, MIMP makes available monthly counts of the awareness campaigns they conduct, the number of reports of IPV, calls to the help line *Línea 100* and the killing of women (femicides) as well as the attempts. All these variables are collected by the Women Centers (*Centro de Emergencia Mujer* or CEMs), which are distributed nationwide and represent the local extensions of the MIMP (see Agüero, 2013 and Kavanaugh et al, 2018 for more details about the CEMs). The time coverage varies by indicator. For the campaigns, the nationwide monthly data are available since early 2004, since 2002 for IPV reports, early 2006

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[5] Taken from MIMP's website. Translated by the author.

for calls to the help line and since January 2009 for the femicides and attempts. In all cases the time series end in November 2015.

The second source comes from the Ministry of Health (*Ministerio de Salud*-MINSA). The data was obtained through a Freedom of Information Act request (*Portal de Transparencia*) and contain the number of visits to health clinics nationwide related to IPV per month. This information is available since 2009 and disaggregates visits by type: mistreatment syndrome, negligence or abuse, risk of IPV (includes emotional, physical and sexual), physical abuse as well as sexual abuse and psychological. We also obtained information of violence against children and we use this variable as a placebo test. As discussed below, this database is relevant because the cases included there have been classified as IPV-related by a trained health professional, such as a medical doctor or a nurse.

Google searches originated in Peru for specific phrases or words constitute the third source of data. Obtained from https://trends.google.com/trends/?geo=PE, we consider three searches.[6] Two of them represented the March (Women/*Mujer*) and November (violence against women/*violencia contra la mujer*) observance days. As a placebo test we included a search for "mothers" (*madre* in Spanish), which is related to the previous searches (all keywords are about women) but should increase in the month of May (Mother's Day is celebrated in the second

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[6] Google does not report the actual search volumes. Instead the search results are "proportionate to the time and location of a query by the following process: Each data point is divided by the total searches of the geography and time range it represents to compare relative popularity. Otherwise, places with the most search volume would always be ranked highest. The resulting numbers are then scaled on a range of 0 to 100 based on a topic's proportion to all searches on all topics. Different regions that show the same search interest for a term don't always have the same total search volumes." See https://support.google.com/trends/answer/4365533?hl=en&ref_topic=6248052 for further details.

Sunday of that month in Peru) and not in March or November. To the best of our knowledge, this is the first paper using Google search data in the context of IPV.[7]

Table 1 presents the summary statistics of these three datasets. On average MIMP conducts 1336 events related to awareness campaigns per month, but during March and November the are many more events (column 3) and the difference with respect to the other months is statistically significant (column 5). This simple difference represents our first evidence that the observance days in March and November act as triggers for the awareness campaigns.

Based on the data from the CEMs, on average, there are more than 3300 reports of IPV per month countrywide and close to 2100 calls to the *Línea 100*.These numbers from the CEMs are consistent with the 2900 monthly cases of psychological abuse, 158 physical abuses and 651 visits due to risk of IPV, as registered by the health clinics. Also, on average, there are almost 18 attempts and femicides per month, with nine killings per month during the period of analysis.

Finally, the fourth data source is the Peruvian Demographic and Health Surveys (DHS). These are nationally representative surveys focused on women aged 15 to 49 and conducted annually in Peru since 2003. In this study we include all the surveys until 2012-2013.[8] The surveys are conducted throughout the year but tend to end by mid-November so it will limit our capacity to capture the observance day occurring in that month. Nonetheless, a key advantage of the DHS is the consistency of the sampling methodology and questionnaire throughout time. Relevant to this study, the DHS provides information on the spouse's attitudes and would allow

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[7] Examples of other economics studies using Google search data include predicting economic indicators in U.S. and Germany (e.g., Choi and Varian, 2011; Askitas and Zimmermann, 2009), racial animus and voting against Barack Obama (Stephens-Davidowitz, 2014). In developing countries, Agüero and Beleche (2015) have used them to understand knowledge about hand sanitizers in Mexico during H1N1 pandemic and interest regarding Mexico's national education standardized test (Agüero and Beleche, 2013).
[8] After that, Peru left the DHS program so we cannot guarantee that the methodology has remained as constant as in the period considered here.

us to explore possible mechanisms for our findings. For example, we can test whether the probability that a husband is more controlling or jealous increases during the observance months.

Table A1 displays the summary statistics for these outcomes after merging all the DHS from 2003 to 2013 and restricting the sample of women with a partner, for whom these questions are asked. Around 43 percent of women report that their partner is jealous if she talks to other men and one-fifth of women are accused of being unfaithful to her partner. When comparing responses in March and November against all other months, we always find that the controlling behaviors are more salient in the months of the observance days. To analyze whether the patterns discussed in this section reflect causal effects we present our econometric methods in the next section.

Econometric model

To estimate the effect of the awareness campaigns on the outcomes described above we consider the following equation:

$$Y_t = \beta \text{Awareness}_t + \theta X_t + e_t \qquad (1)$$

where Y_t is an outcome measured at time t (using monthly data). The variable of interest is *Awareness* and captures the number of awareness campaigns conducted by MIMP at time *t*. Thus, β is the parameter of interest, thus, if the campaigns increase IPV we would expect $\beta > 0$. To homogenize the interpretation of β across all outcomes, we estimate a double-log model thus, β will represent an elasticity. Given that some values could be zero for some months, we use an inverse hyperbolic sine transformation (e.g., Burbidge et al, 1988; MacKinnon and Magee, 1990 and Pence, 2006). Control variables are included in X_t (e.g., year fixed-effects and the level of economic activity as measured by electricity consumption nationwide). As expected, estimation

of (1) via OLS is unlikely to yield causal estimates. This could occur if policy markers create awareness campaigns in response to acts of violence leading to a reverse causality problem. The possible presence of unobserved variables that could explain, at the same, the number of campaigns and the violence, would also bias OLS estimates.

To address these possible problems, this study proposed a new source of exogenous variation in the number of awareness events organized by MIMP. As discussed in the previous section, the observance days for International Women's Day (March 8) and for the International Day for the Elimination of Violence against Women (November 25) were created by United Nations for reasons unrelated to the Peruvian events. However, they trigger a seasonal increase in the number of awareness campaigns organized by the MIMP. Thus, these two months could serve as instrumental variables for these events. In that case, Equations (2) and (3) would allow us to obtain causal estimates of the impact of awareness campaigns:

$$\text{Awareness}_t = \pi\, \text{OD}_t + \lambda X_t + u_t \qquad (2)$$

$$Y_t = \beta\, E[\text{Awareness}_t | \text{OD}_t] + \theta X_t + e_t \qquad (3)$$

The validity of our identification strategy relies on two key assumptions. First, the observance days (OD) should strongly predict the awareness campaigns. We have already provided preliminary evidence of this in Table 1. The raw data show that in March and November there is a 46.3 percent increase in the number of campaigns relative the other months of the year. This difference is statistically significant at the five percent. In the next section we provide further graphical and regression-based evidence that the first stage is very strong satisfying the first assumption.

Second, the observance days should have an effect on the outcomes analyzed here only through their impact on the awareness campaigns. While this impossible to validate empirically,

we present strong evidence in favor of this assumption. As discussed in section three, the observance days were created by the United Nations and not by the Peruvian government. These days reflect women's struggles in the Dominican Republic and Russia and again, are unrelated to the Peruvian context. These days do not capture and do not respond to any event (violent or not) related to Peru and therefore it is unlikely that the exclusion restriction is violated. Nonetheless, in the next section we present a series of robustness checks that further strengthen the validity of our assumption.

5. Results

First stage: observance days for women issues trigger awareness campaigns

We start documenting our findings by examining the strength of the first stage for our 2SLS methodology. Figure 1 shows two very clear patterns with respect to the awareness campaign organized by the MIMP. First, there is a clear positive trend in the number of the events. In 2004 there were 6717 awareness campaigns while there were close to 26000 by 2014. This reflects both the higher budget allocated to the MIMP during the booming Peruvian economy (associated to the commodity prices) and the more attention paid to the case of IPV. Second, the spikes in the number of the campaigns are clearly related to the months of March (dashed vertical lines) and November (solid vertical lines). This is consistent with the evidence presented in Table 1 using raw data.

To formality test for the strength of the first stage, Table 2 presents the results of estimating Equation (2). In column (1), the variable for the observance days (OD_t) is defined as equal to one if the month is *either* March or November and zero otherwise. We find a 35 percent increase in the number of awareness campaigns during these months relative to the rest of the

year, after controlling for year fixed-effects and monthly economic activity. This association is statistically significant at the one percent level. In column (2) we consider an alternative definition for the observance days with separate binary variables for March and November. In March, the number of campaigns and events increase by 17.5 percent while in November the increase is of 53 percent, compared to the other months. Both are statistically significant at the one percent level and we can also reject the null hypothesis that these parameters have the same magnitude (p-value<0.000). Based on these findings, our preferred specification will have two separate instruments and the 2SLS will be estimated using a robust GMM approach. However, we report estimates using the just-identified model (one instrument: joint binary variable for March and November) as well as the over-identified model (two instruments: one binary variable per Month).

The time-series nature of the analysis allows us to consider two robustness checks displayed in columns (3)-(6) of Table 2. We first consider a Prais-Winsten model to account for autocorrelation in the error term. Using this alternative specification does not change our conclusion: there is a very strong first stage and the effect of November is stronger (economically and statistically speaking) compared to March (columns 3 and 4) and both are different from zero in a statistical sense. Second, we employ a Poisson model for the dependent variable treating it as counts and ignoring the logarithmic transformation. Again, our results do not vary in this case either (columns 5 and 6). Thus, to make our findings more transparent to the readers, we consider the simpler model as shown in columns (1) and (2).[9] Finally, as shown in all the tables reporting the 2SLS estimates (Tables 3 to 6), the F-statistics for the first stage are never below 30 and could be as high as 70, implying a very strong first stage.

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[9] Note also that the parameters obtained from the simpler model are in between the Prais-Winsten (higher) and Poisson (lower) results, but these differences are not statistically significant.

Did the campaigns increase the demand for knowledge?

We explore this question using data from Google searches originated in Peru as described in section 4. The goal is to test whether the campaigns attracted sufficient attention from the public. Google data on searches allow us to measure demand for knowledge using specific keywords for each observance day. For instance, we explore the search patterns for the word "women" (*mujer*) as this would be related to International Women's Day (observed in March 8). In Figure 2A, we identify a very clear pattern as this keyword is more searched in March. In Table 3 we present the 2SLS estimates and find an elasticity of 0.22 (standard error=0.078) associated with the awareness campaigns when employing the over-identified model (Panel B, column 1). This elasticity is even larger (0.667, se=0.179) in the just identified model (Panel A, column 1). In Appendix Table A2, we present the reduced form regressions for all the Google-based outcomes and show that the effect for this keyword comes from the searches originated in March leading to an increase of 37 percent (Panel A).

An analogous finding is observed for searches of the expression "violence against women" (*violencia contra la mujer*). Figure 2B shows the November-peak pattern visually. This is confirmed in Appendix Table A2 (Panel B). The corresponding elasticity related to the awareness campaigns is 5.8 (Table 3, column 2, Panel B).

Searches for the keyword "mother" (*madre*) provide us with the first of several placebo checks. If searches for "mother" were to peak in March or November, it would mean that some other (unobserved) variables could be behind such a pattern. This is not the case. These searches peak in May (Mother's Day) but do not in March or November (Figure 2C and Table A2 for the

reduced form regressions). Reinforcing the validity of our identification strategy, awareness

campaigns are *negatively* associated with searches for the word "mother" (Table 3, column 3).

Effects of the campaigns on intimate personal violence

Table 4 shows the 2SLS for the elasticity of reports of IPV and calls to the help line with respect

to the awareness campaigns, while Figure 3 presents monthly patterns for both outcomes. In our

preferred specification (Panel B), the elasticity for the calls is 0.316 but statistically significant at

the ten percent level only (column 2). However, for the reports of IPV, we estimate that an

exogenous 10 percent increase in the number of awareness campaigns leads to 1.2 percent

increase in the number of IPV incidents nationwide.

We argue that this increase reflects an actual surge in violence against women and not

just a rise in reporting of possibly previous events. For example, there is anecdotal evidence that

prominent episodes related to violence against women have led to more reporting. This can be

seen in the higher number of calls to the U.S. National Sexual Assault Hotline when Dr.

Christine Blasey Ford testified before a Senate Committee during the hearings for then Supreme

Court nominee Brett Kavanaugh.[10] Similar increases in reporting can be found in Latin American

countries during the street demonstrations related to the *#NiUnaMenos* movement. Spikes has

been documented for such demonstrations in Peru and Argentina.[11] In all these cases, the sudden

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[10] See Time Magazine's reporting on the issue: http://time.com/5409239/national-sexual-assault-hotline-spike-christine-blasey-ford-hearing/.

[11] For Argentina see https://fusion.tv/story/144260/argentina-leads-charge-against-femicides-in-latin-america/?utm_source=twitter&utm_medium=social&utm_campaign=thisisfusion&hootPostID=7f971279f5d50abda75328f974798e84. Peru had a similar march in August of 2016 and increase in reports where documented in the media (https://altavoz.pe/2012/02/21/17878/denuncias-de-violencia-de-genero-aumentaron-un-40-tras-marcha-niunamenos/).

increases reflect mainly the reporting pre-existing acts of violence. Below we provide evidence that the awareness campaign created new acts of violence.

To prove this point, we explore the effect of the awareness campaigns on visits to health clinics for IPV related episodes. These data come from medical professionals who diagnosed patients and therefore represent an alternative source to the general reports of IPV to the Women Emergency Centers, which are not health clinics. It is possible however, that women visiting CEMs could be referred to a health clinic. But this situation reinforces the use of health clinic-based data as these referrals are more likely to reflect actual and current violent episodes as opposed to past cases. Table 5 shows that the awareness campaigns are associated with more visits as shown by the 2SLS estimates. The elasticities for general mistreatment (0.21, see also Figure 5 for the reduced form graph), negligence (0.67), sexual (0.26) and psychological abuse (0.18) are each statistically significant at the one percent level.

As a placebo test, we consider child physical abuse. A positive (and statistically significant) impact of the awareness campaigns about IPV on child abuse would diminish the validity of our findings. The campaigns under study do not target this type of violence so a positive effect would reflect the possibility that the exclusion restriction fails: the observance days would not represent an exogenous source of variation. Column (7) of Table 5 shows that there is a *negative* association between the awareness campaigns and child abuse and it is not statistically different from zero. This negative relation is found when using the just-identified (Panel A) and over-identified models (Panel B). Thus, this evidence further reinforces our identification strategy.

To provide additional evidence that the awareness campaigns increase violence against women, we turn to femicides —the killing of women by their partners— as well as attempts.

Figure 5 provides the visual representation of the monthly patterns. Table 6 presents the 2SLS estimates. In column (1) we show that the association of femicide attempts with the awareness campaigns is negative, although not statistically different from zero. However, the effect on just femicides is positive and significant. We take advantage that we have two data sources for this measure. In column (2) we use data from MIMP and we find a large elasticity (0.63) but that is significant only at the 10 percent. In column (4) we use data from the Peruvian National Bureau of Statistics (INEI) and find an elasticity of 0.46 that is statistically significant at the one percent level. This evidence strengthens our conclusion: the awareness campaigns led to more violence against women. This is observed through an increase in reports of IPV, calls to help line, visits to health clinics due to IPV and even on the killing of women.

6. Mechanisms

To explore possible mechanisms, we use data from the Peruvian DHS ranging from 2003 to 2013, as described in section 4. It is not possible to link the data on events to the DHS so the focus is on the reduced-form equation: Men's attitudes as a function of the observance days in March and November. This approach is related to the literature that exploits date of interview to examine behavioral changes (e.g., Evans and Moore, 2012; Fernandez and Saldarriaga, 2014; Cotti et al, 2016).

As described also in the data section, one limitation of using the DHS is that the survey period tends to end around November 15, thus, we do not have enough power to measure the impact of the observance day that takes place in that month. In these regressions we include controls for fixed-effects for survey year, year of birth, completed years of schooling, marital

status, urban/rural and region of residence. Robust standard errors are clustered at the sampling unit (over 200 clusters).

Table 7 presents the results of estimating these reduced form equations. Focusing on Panel B where we use a separate binary variable for March and November, we find that a woman interviewed in March, after controlling for several characteristics, is more likely to report that her partner is jealous when she talks to other men (column 1), that he accuses her of being unfaithful (column 2), that he restricts contacts with her family (column 4) and friends (column 3) and that he demands to know where she is at all times (column 5). All these outcomes are statistically significant at the one percent level, except for the first outcome that is significant only at the five percent level.

As a final placebo test, in column 6, we consider the spouse's behavior with respect to money: an issue that is not central to the awareness campaigns. In Table 7 we report a null effect (0.003) that is not different from zero statistically speaking.

7. Conclusions

This paper shows that massive awareness campaigns in Peru are associated with more violence against women. This is observed in terms of intimate partner violence reporting, calls to a help line, violence-related visits to health clinics and to femicides. The use of international observance days as plausible instruments for the campaigns suggests that the effects on violence are causal. Additional robustness checks further support this claim.

As a possible mechanism we found more controlling behavior from men during the months associated with the observance days.

These findings suggest that, in countries where violence is already high as in the case of Peru, there are strong short-term costs of campaigns that seek to change social norms. Our results cannot shed light on whether these costs are limited to short-term effects and if the long-run impacts of these campaigns would lead to better outcomes. This is an important line of research that deserves future attention.

Until those findings are well established, policy makers should pay attention to alternative ways of providing information to change social norms. First, family planning programs have been successful in changing fertility preferences, while using public information campaigns (see de Silva and Tenreyro, 2017, for a recent review). This occurs despite the fact that there is a mismatch in preferences within couples (Ashraf et al, 2014). Thus, a closer look at the best-practices from these public health policies would be informative. A second possibility is to use more personalized information instead of mass campaigns; however, such efforts could be more expensive and require access to information that could not be available in developing countries. A third option is to still use massive campaigns but with different mediums to deliver the message. Recent papers in India (Jensen and Oster, 2009) and Brazil (La Ferrara, et al, 2012) have shown that cable and satellite television as well as regular TV could altered self-reported social norms. While these papers have not tested for actual violent acts, their findings indicate that TV-based messages could provide a valid medium for more effective changes in social norms and in violence against women.

References

Agüero, J. M. (2013). Causal Estimates of the Intangible Costs of Violence against Women in Latin America and the Caribbean (No. 4609). Inter-American Development Bank.

Agüero, J. M., & Beleche, T. (2013). Test-Mex: Estimating the effects of school year length on

    student performance in Mexico. *Journal of Development Economics*, 103, 353-361.

Agüero, J. M., & Beleche, T. (2017). Health shocks and their long-lasting impact on health

    behaviors: Evidence from the 2009 H1N1 pandemic in Mexico. *Journal of Health*

    Economics, 54, 40-55.

Ashraf, N., Field, E., & Lee, J. (2014). Household bargaining and excess fertility: an

    experimental study in Zambia. *American Economic Review*, 104(7), 2210-37.

Askitas, N., & Zimmermann, K. F. (2009). Google econometrics and unemployment forecasting.

    Applied Economics Quarterly, 55(2), 107-120.

Burbidge, J. B., Magee, L., & Robb, A. L. (1988). Alternative transformations to handle extreme

    values of the dependent variable. *Journal of the American Statistical Association*, 83(401),

    123-127.

Busso, M., Cristia, J., & Humpage, S. (2015). Did you get your shots? Experimental evidence on

    the role of reminders. *Journal of Health Economics*, 44, 226-237.

Cho, H., & Salmon, C. T. (2007). Unintended effects of health communication campaigns.

    Journal of Communication, 57(2), 293-317.

Choi, H., & Varian, H. (2012). Predicting the present with Google Trends. *Economic Record*, 88,

    2-9.

Cotti, C., Gordanier, J., & Ozturk, O. (2016). Eat (and drink) better tonight: food stamp benefit

    timing and drunk driving fatalities. *American Journal of Health Economics*, 2(4), 511-534.

de Silva, T., & Tenreyro, S. (2017). Population control policies and fertility convergence.

    Journal of Economic Perspectives, 31(4), 205-28.

Dupas, P. (2011). Health Behavior in Developing Countries. *Annual Review of Economics*, 3(1), 425-449.

Ellsberg, M., Arango, D. J., Morton, M., Gennari, F., Kiplesund, S., Contreras, M., & Watts, C. (2015). Prevention of violence against women and girls: what does the evidence say?. *The Lancet*, 385(9977), 1555-1566.

Evans, W. N., & Moore, T. J. (2012). Liquidity, economic activity, and mortality. *Review of Economics and Statistics*, 94(2), 400-418.

Fernandez, F., & Saldarriaga, V. (2014). Do benefit recipients change their labor supply after receiving the cash transfer? Evidence from the Peruvian Juntos program. IZA *Journal of Labor & Development*, 3(1), 2.

Jacobsen, G. D., & Jacobsen, K. H. (2011). Health awareness campaigns and diagnosis rates: evidence from National Breast Cancer Awareness Month. *Journal of Health Economics*, 30(1), 55-61.

Jensen, R., & Oster, E. (2009). The power of TV: Cable television and women's status in India. *The Quarterly Journal of Economics*, 124(3), 1057-1094.

Kavanaugh, G., Sviatschi, M. & Trako, I. (2018) Inter-Generational Benefits of Improving Access to Justice for Women: Evidence from Peru. Mimeo, Princeton.

Keller, S. N., & Honea, J. C. (2016). Navigating the gender minefield: An IPV prevention campaign sheds light on the gender gap. *Global Public Health*, 11(1-2), 184-197.

Keller, S. N., Wilkinson, T., & Otjen, A. J. (2010). Unintended effects of a domestic violence campaign. *Journal of Advertising*, 39(4), 53-68.

La Ferrara, E., Chong, A., & Duryea, S. (2012). Soap operas and fertility: Evidence from Brazil. *American Economic Journal: Applied Economics*, 4(4), 1-31.

MacKinnon, J. G., & Magee, L. (1990). Transforming the dependent variable in regression

    models. *International Economic Review*, 315-339.

Pence, K. M. (2006). The role of wealth transformations: An application to estimating the effect

    of tax incentives on saving. *The BE Journal of Economic Analysis & Policy*, 5(1).

Purtle, J., & Roman, L. A. (2015). Health awareness days: sufficient evidence to support the

    craze?. *American Journal of Public Health*, 105(6), 1061-1065.

Schramm, W. (1954). How communication works, in *The Process and Effects of Mass*

    Communication, Wilbur Schramm, ed., Urbana: University of Illinois Press, 3–26.

Stephens-Davidowitz, S. (2014). The cost of racial animus on a black candidate: Evidence using

    Google search data. *Journal of Public Economics*, 118, 26-40.

Westley, B. H. & McLean, M. (1957). A Conceptual Model for Mass Communication Research.

    Journalism Quarterly, 34(Winter), 31–38.

Wolfe, D. A., & Jaffe, P. G. (1999). Emerging strategies in the prevention of domestic violence.

   *The Future of Children*, 133-144.

Figure 1. Seasonal patterns of awareness campaigns for violence against women
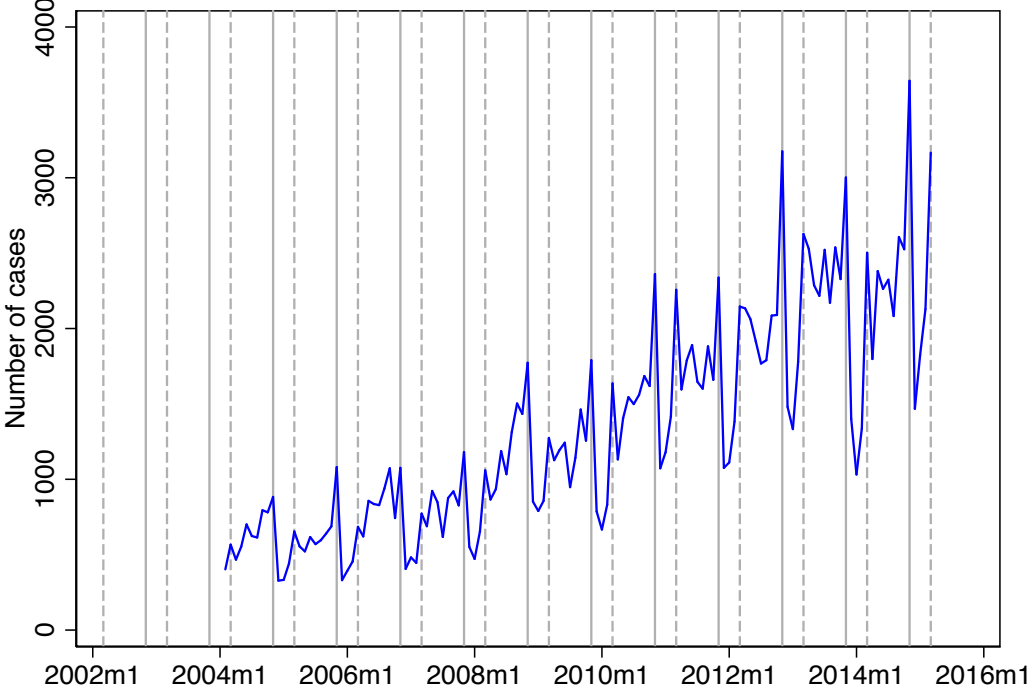
Note: The line represents the number of awareness campaigns per month related organized by MIMP to address intimate personal violence and violence against women. The dashed (solid) vertical lines represent the month of March (November).
Data source: MIMP

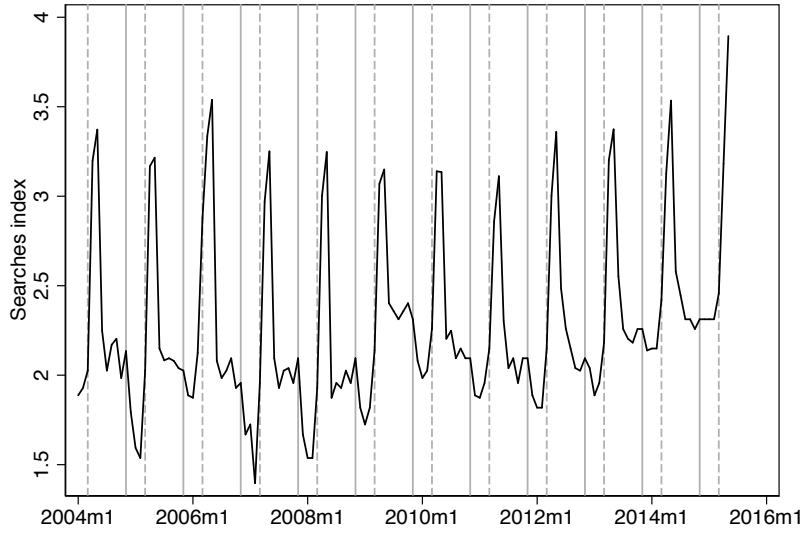Figure 2. Seasonal patterns for Google searches

Panel A. Searches for "woman"
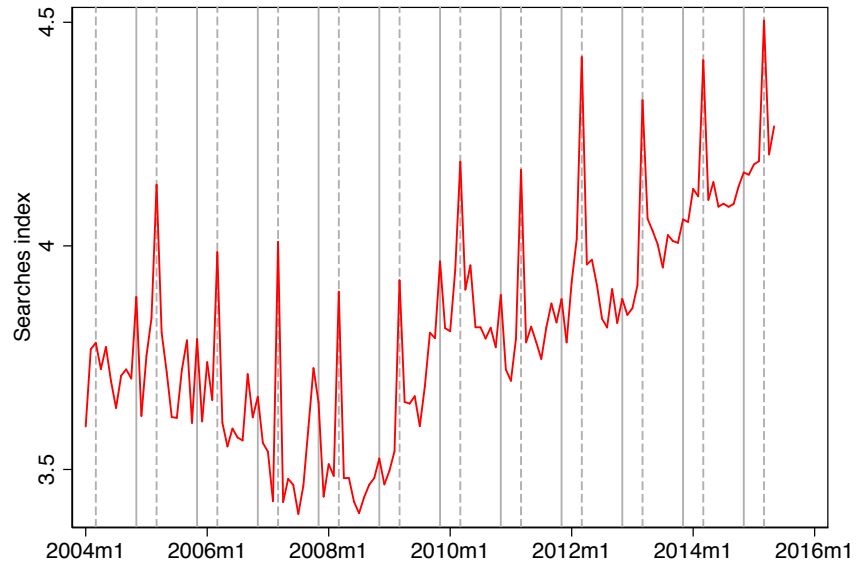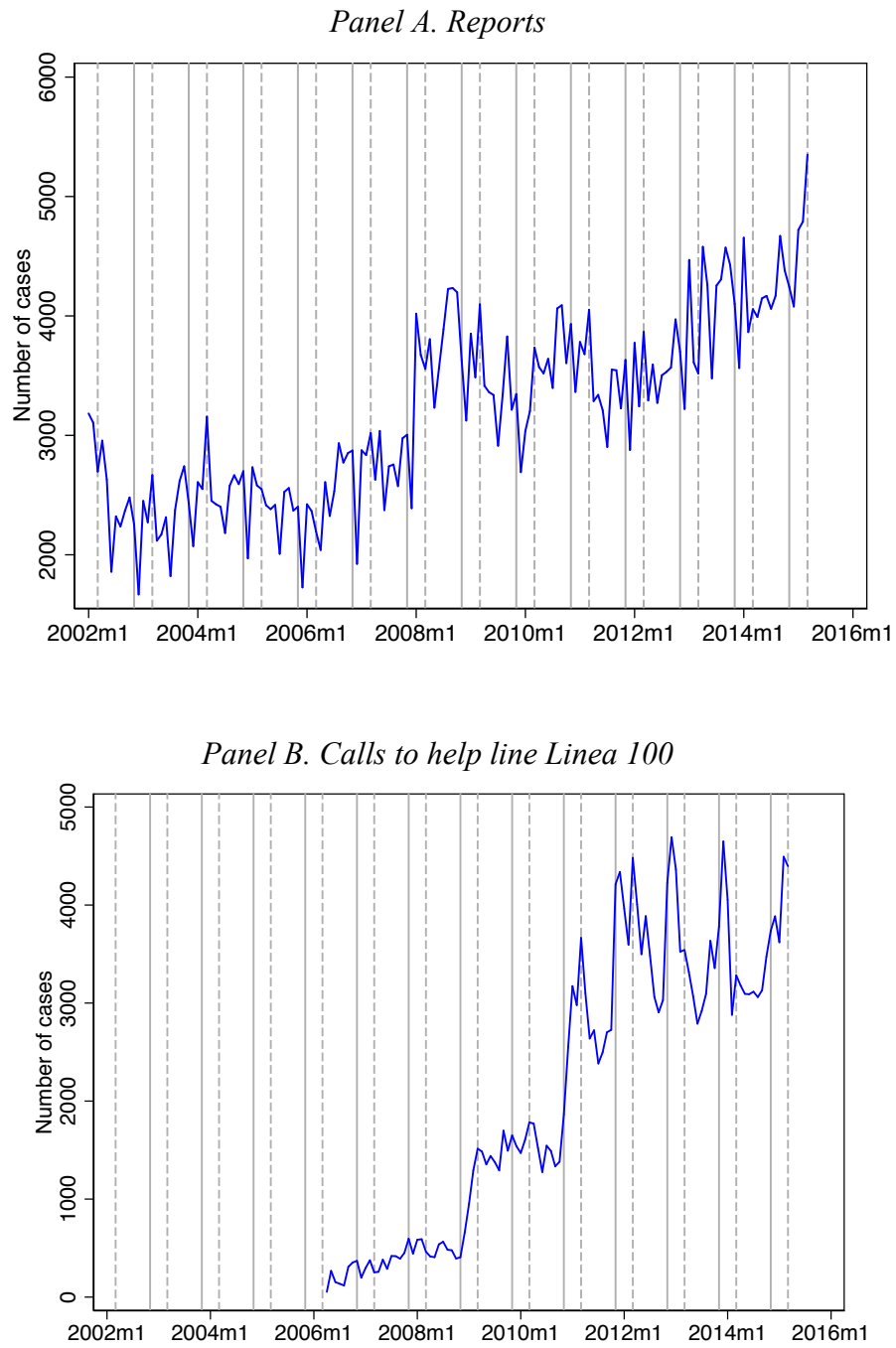

Panel B. Searches for "violence against women"
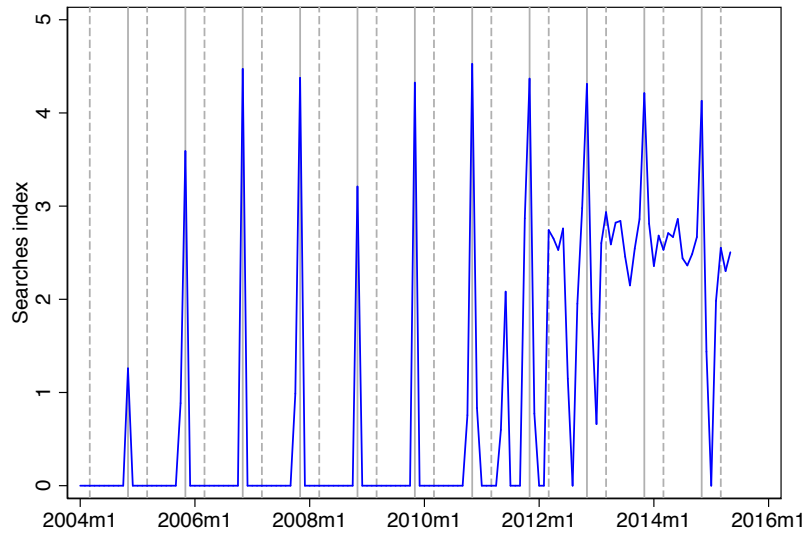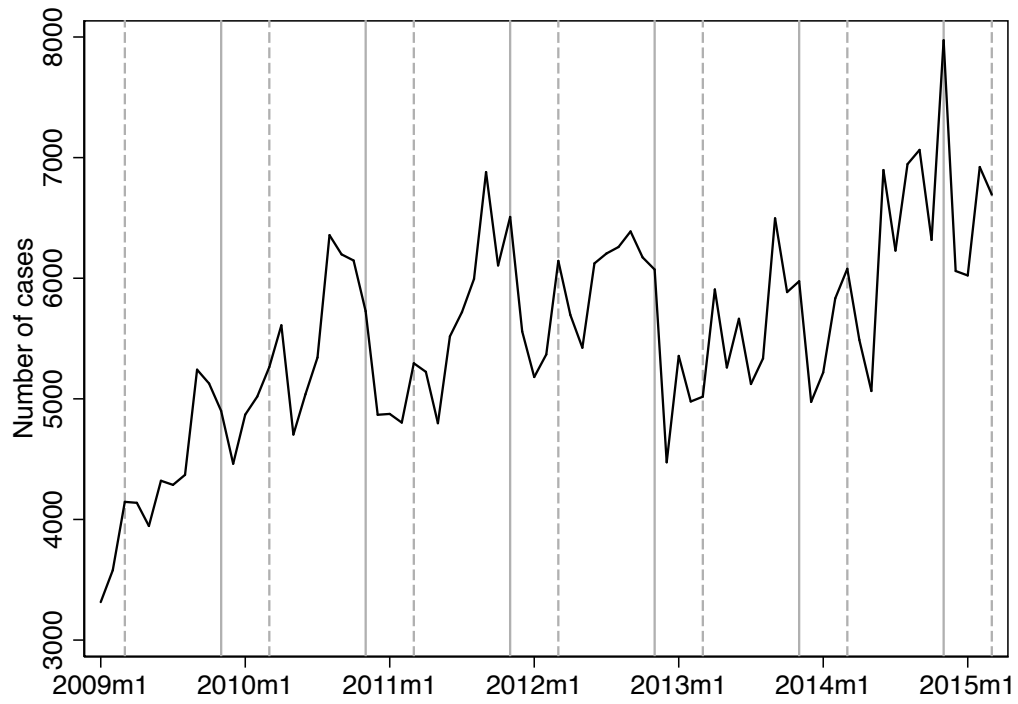

Panel C. Searches for "Mother"

Note: The dashed (solid) vertical lines represent the month of March (November).
Data source: Google trends.

Figure 3. Seasonal patterns in the reports of violence against women and call to help line

Panel A. Reports

*Panel B. Calls to help line Linea 100*

Note: The dashed (solid) vertical lines represent the month of March (November).
Data source: MIMP

Figure 4. Seasonal patterns in visits to health clinics for violence against women incidents

Note: The dashed (solid) vertical lines represent the month of March (November).
Data source: MINSA.

Figure 5. Seasonal patterns in killings of women by data source
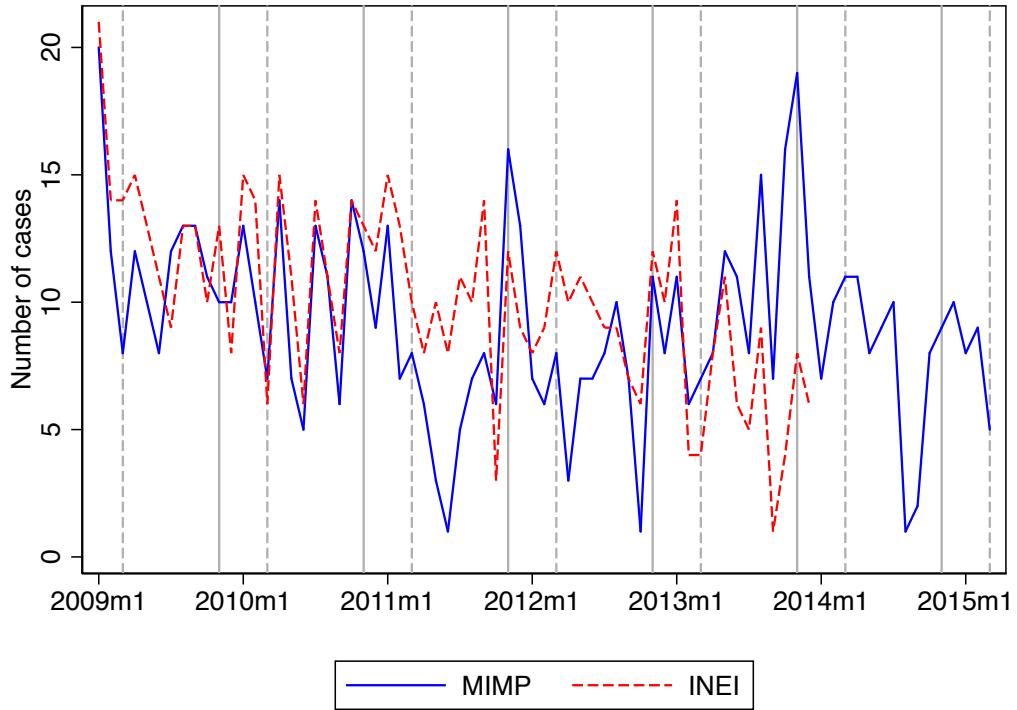
Note: The dashed (solid) vertical lines represent the month of March (November).
Data source: MIMP and INEI.

<p style="text-align:center">Table 1. Summary statistics</p>

Variables	Obs.	Average values			Difference	
		All months	March and November	Other months		
	(1)	(2)	(3)	(4)	(3)-(4)	
Awareness campaigns	134	1336.2	1810.8	1237.9	572.9	**
Google searches for						
"woman"	134	3.8	4	3.8	0.2	***
"violence against women"	134	1.0	2.3	0.7	1.6	***
"mother"	134	2.3	2.2	2.3	-0.1	
Reports and calls to help lines						
Reports of violence	134	3333.5	3509.3	3297.1	212.2	
Calls to help line (*Línea* 100)	108	2089.9	2457.2	2016.4	440.8	
Clinic visits						
Mistreatment syndrome	75	5527.3	5830.3	5463.7	366.6	
Negligence or abuse	75	303.1	362.2	290.7	71.5	
Risk of abuse [a]	75	651.4	687.2	643.9	43.3	
Physical abuse	72	157.6	160.7	157	3.7	
Sexual abuse	75	407.9	436.2	402	34.2	
Psychological abuse	75	2903.2	3022.6	2878.1	144.5	
Killings and attempts						
Attempts and killings	75	17.7	18.8	17.5	1.3	
Attempts	75	8.6	8.8	8.6	0.2	
Killings (MIMP	75	9.1	10.1	8.9	1.2	
Killings (INEI source)	60	10.2	10.4	10.1	0.3	

[a] It includes sexual, physical and emotional abuse.
Note: Google searches refer to the words in Spanish ("mujer," "violencia contra la mujer" and "mother,"
respectively). See text for sources and further definitions. Significant differences between columns (3) and (4) at the
10%, 5% and 1% level are labeled with *, ** and ***, respectively.

Table 2. First stage results

| | Dependent variable: number of awareness campaigns for IPV | | | | | |
| | OLS | | Prais–Winsten | | Poisson | |
	(1)	(2)	(3)	(4)	(5)	(6)
Joint	0.349***		0.484***		0.352***	
	(0.058)		(0.042)		(0.050)	
March		0.175***		0.339***		0.191***
		(0.051)		(0.047)		(0.044)
November		0.528***		0.589***		0.496***
		(0.046)		(0.063)		(0.042)
N	134	134	134	134	134	134
Adjusted R^2	0.775	0.791	0.744	0.762		
Durbin-Watson	0.812	0.726	1.317	1.345		
P-value		0.000		0.002		0.000

Note: Robust standard errors in parentheses. Dependent variables are measured in logarithms using an inverse hyperbolic sine transformation to deal with zero values. All regressions include year fixed effects and controls for electricity use (not shown). Columns (3) and (4) consider autoregressive errors. Columns (5) and (6) use Poisson regressions. P-value refers to the test that the equality of the March and November coefficients.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3. Effect of awareness on Google searches (2SLS)

	Women	Violence against women	Mother
	(1)	(2)	(3)
Panel A. One instrument (joint)			
Awareness campaigns	0.667***	4.597***	-0.358*
	(0.179)	(0.819)	(0.207)
N	134	134	134
Adj. R^2	0.170	0.186	-0.194
F-stat (first stage)	36.0	36.0	36.0
Panel B. Two instruments (March and November)			
Awareness campaigns	0.223***	5.773***	-0.270**
	(0.078)	(0.745)	(0.115)
N	134	134	134
Adj. R^2	0.658	-0.185	-0.147
F-stat (first stage)	70.7	70.7	70.7

Dependent variable: (Log) Google searches for keyword

Note: Robust standard errors in parentheses. Dependent variables and the number of awareness campaigns are measured in logarithms using an inverse hyperbolic sine transformation to deal with zero values. All regressions include year fixed effects and controls for electricity use (not shown). The F-statistics refers to the first stage.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Effect of awareness on reports of violence against women (2SLS)

	Dependent variable: (Log) Number of	
	Reports of violence	Call to help line
	(1)	(2)
Panel A. One instrument (joint)		
Awareness campaigns	0.186***	0.266
	(0.068)	(0.162)
N	134	108
Adj. R^2	0.816	0.942
F-stat (first stage)	36.0	38.6
Panel B. Two instruments (March and November)		
Awareness campaigns	0.116***	0.316*
	(0.040)	(0.162)
N	134	108
Adj. R^2	0.820	0.939
F-stat (first stage)	70.7	49.1

Note: Robust standard errors in parentheses. Dependent variables and the number of awareness campaigns are measured in logarithms using an inverse hyperbolic sine transformation to deal with zero values. All regressions include year fixed effects and controls for electricity use (not shown). The F-statistics refers to the first stage.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5. Effects on health visits related to violence (2SLS)

	Dependent variable: (Log) Number of health visits due to:						
	General mistreatment	Neglige nce or abando nment	Risk of abuse (all 3 cases)	Physi cal	Sexual	Psychol ogical	Child physical abuse
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. One instrument							
Awareness campaigns	0.137*	0.595**	0.119	1.027	0.270***	0.133**	-0.071
	(0.073)	(0.270)	(0.139)	(0.661)	(0.079)	(0.061)	(0.577)
N	75	75	75	72	75	75	72
Adj. R^2	0.624	0.730	0.895	0.951	0.410	0.623	0.940
F-stat (first stage)	38.1	38.1	38.1	34.9	38.1	38.1	34.9
Panel B. Two instruments							
Awareness campaigns	0.205***	0.672***	0.219*	0.212	0.256***	0.178***	-0.287
	(0.064)	(0.258)	(0.124)	(0.489)	(0.071)	(0.050)	(0.554)
N	75	75	75	72	75	75	72
Adj. R^2	0.644	0.720	0.899	0.959	0.422	0.642	0.939
F-stat (first stage)	40.0	40.0	40.0	39.7	40.0	40.0	39.7

Note: Robust standard errors in parentheses. Dependent variables and number of the awareness campaigns are measured in logarithms using an inverse hyperbolic sine transformation to deal with zero values. All regressions include year fixed effects and controls for electricity use (not shown). The F-statistic refers to the first stage.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6. Effect of awareness campaigns on killings and attempts (2SLS)

	Attempts	Femicides (MIMP)	Femicides (INEI)
	Dependent variable: (Log) Number of women:		
	(1)	(2)	(3)
Panel A. One instrument			
Awareness campaigns	0.147	0.409	0.197
	(0.296)	(0.345)	(0.289)
N	75	75	60
Adj. R^2	0.478	-0.017	0.206
F-stat (first stage)	38.1	38.1	31.1
Panel B. Two instruments			
Awareness campaigns	-0.106	0.631[*]	0.459[***]
	(0.211)	(0.324)	(0.178)
N	75	75	60
Adj. R^2	0.490	-0.120	0.107
F-stat (first stage)	40.0	40.0	32.8

Note: Robust standard errors in parentheses. Dependent variables and the number of awareness campaigns are measured in logarithms using an inverse hyperbolic sine transformation to deal with zero values. All regressions include year fixed effects and controls for electricity use (not shown). The F-statistic refers to the first stage.
[*] $p < 0.10$, [**] $p < 0.05$, [***] $p < 0.01$

Table 7. Mechanisms: Male partner's attitudes (reduced form)

| | Is jealous if she talks to other men | Accuses her of unfaithfulness | Does not allow her to meet with | | Wants to know where she is all the time | Does not trust her with money |
			Friends	Family		
	(1)	(2)	(3)	(4)	(5)	(6)
Mean	0.434	0.200	0.181	0.149	0.531	0.162
Panel A. Joint						
Joint	0.008*	0.010**	0.007**	0.008**	0.012**	0.003
	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.003)
N	75493	75838	75876	75889	75900	75746
Adj. R^2	0.051	0.073	0.070	0.069	0.030	0.058
Panel B. March and November						
March	0.013**	0.016***	0.016***	0.017***	0.021***	0.003
	(0.006)	(0.005)	(0.005)	(0.004)	(0.006)	(0.004)
November	-0.000	-0.002	-0.008	-0.007	-0.005	0.002
	(0.008)	(0.007)	(0.005)	(0.005)	(0.009)	(0.005)
N	75493	75838	75876	75889	75900	75746
Adj. R^2	0.051	0.073	0.070	0.070	0.030	0.058

Note: Robust standard errors clustered by sampling units. All regressions include fixed-effects for survey year, year of birth, completed years of schooling, marital status, urban/rural and region.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A1. Observance days established by the United Nations
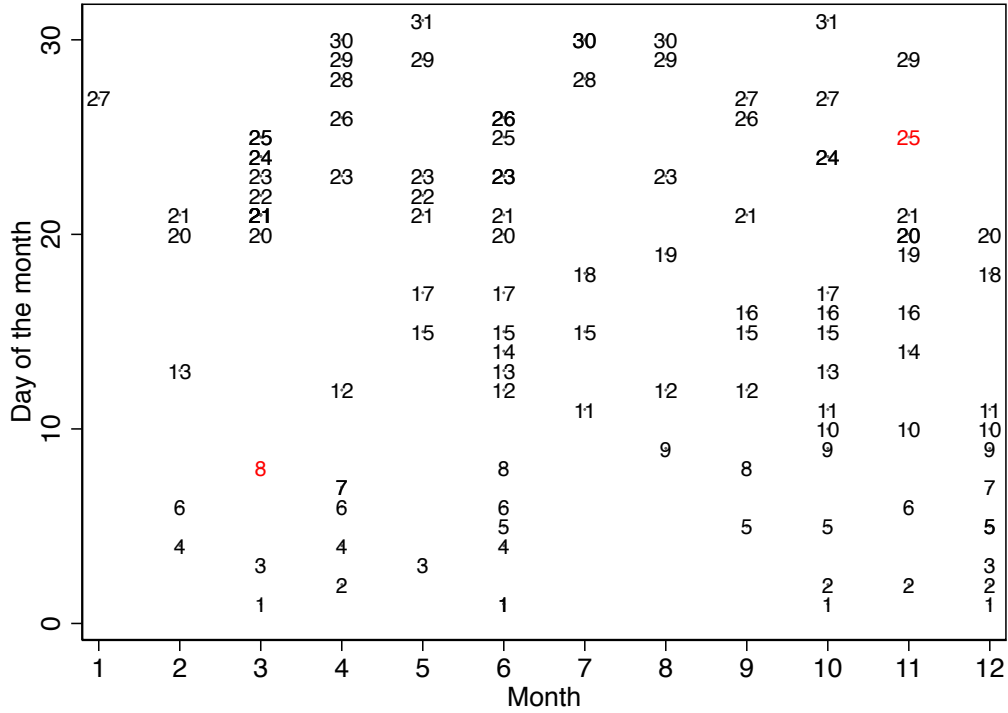
Note: The days marked in red refer to the International Women's Day (March 8) and the Day for the Elimination of Violence Against Women (November 25). Data source: http://www.un.org/en/sections/observances/international-days/

Figure A2. Screenshots from MIMP's awareness campaigns

Table A1. Summary statistics: Demography and Health Surveys

| Variables: husband/partner's behavior | Obs. | Average values | | | Differ ence | |
| | | All months | March and November | Other months | | |
	(1)	(2)	(3)	(4)	(3)-(4)	
Is jealous if she talks to other men	75493	0.434	0.438	0.433	0.005	
Accuses her of being unfaithful	75838	0.200	0.205	0.198	0.007	
Does not allow her to see her friend	75876	0.181	0.184	0.181	0.004	
Limits visits to her family	75889	0.149	0.154	0.148	0.006	
Insists to know where she is	75900	0.531	0.542	0.528	0.014	**
Does not trust her with money	75746	0.162	0.163	0.162	0.001	

Note: It includes all Peruvian Demographic and Health Surveys from 2003-2013. Sample is restricted to women with a current husband or partner. See text for further definitions. Significant differences between columns (3) and (4) at the 10%, 5% and 1% level are labeled with *, ** and ***, respectively.

	(1)	(2)	(3)
Panel A. Searches for "woman"			
Joint	0.219***		
	(0.047)		
March		0.368***	0.371***
		(0.080)	(0.080)
November		0.080***	0.082***
		(0.018)	(0.018)
May			0.026*
			(0.015)
N	591	591	591
Adj. R^2	0.473	0.537	0.539
Durbin-Watson	1.944	1.907	1.907
Panel B. Violence against women			
Joint	0.992***		
	(0.212)		
March		-0.071	-0.087
		(0.128)	(0.136)
November		2.084***	2.083***
		(0.321)	(0.321)
May			-0.094
			(0.092)
N	591	591	591
Adj. R^2	0.160	0.351	0.351
Durbin-Watson	2.095	2.138	2.138
Panel C. Searches for "mother"			
Joint	0.002		
	(0.035)		
March		-0.146**	-0.008
		(0.067)	(0.050)
November		0.115***	0.070*
		(0.044)	(0.039)
May			0.522***
			(0.152)
N	591	591	591
Adj. R^2	-0.008	-0.002	0.072
Durbin-Watson	1.472	1.475	1.370

Note: Robust standard errors in parentheses. Google searches refer to the words in Spanish ("mujer," "violencia contra la mujer" and "mother," respectively). Dependent variables are measured in logarithms using an inverse hyperbolic sine transformation to deal with zero values. All regressions include year fixed effects and controls for electricity use (not shown). Google searches reflect weekly data.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$