Economics Letters 161 (2017) 43–46

Contents lists available at ScienceDirect

Economics Letters

journal homepage: www.elsevier.com/locate/ecolet

Improving access to preventive maternal health care using reminders: Experimental evidence from Guatemala☆

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HIGHLIGHTS

- Experiment designed to improve access to prenatal care in a low-resource setting.
- The intervention consisted of timely reminders delivered in person by health care workers.
- Prenatal doctor visits increased by 3.4-7.8 percentage points.
- Effect was larger for women with riskier pregnancies (older women and those with a previous miscarriage).

ARTICLE INFO

Article history:
Received 6 July 2017
Received in revised form 14 September 2017
Accepted 18 September 2017
Available online 23 September 2017

JEL classification:
I12
O15
C93

Keywords:
Reminders
Prenatal care
Field experiment
Guatemala

ABSTRACT

This paper reports the results of an experiment designed to improve access to prenatal care of pregnant women in a low-resource setting. A simple intervention of timely reminders delivered in person by community health care workers was found to increase prenatal doctor visits by 3.4-7.8 percentage points. The effect was larger for women with riskier pregnancies.

1. Introduction

Each year more than 300,000 women and 2.5 million babies die because of pregnancy and childbirth related complications. Most of these deaths occur in low-resource settings and most can be prevented (WHO, 2016). For this reason, medical associations around the world recommend prenatal care visits for pregnant women during which the medical team provides counseling and assesses the health of the mother and the fetus. This paper presents the results of a large randomized control trial conducted in rural Guatemala, in which pregnant women received reminders from community health workers to let them know when they were due to attend a prenatal care visit. These simple reminders increased the likelihood of attending a prenatal care visit by 3.4–7.8 percentage points. The treatment effect was larger for women who were pregnant for the first time and women with potentially riskier pregnancies.

This paper contributes to the literature that studies the demand for health and, more specifically, for prenatal care among the poor (e.g. Evans and Lien, 2005 and Hoynes et al., 2015). It also complements the work by Busso et al. (2015) sharing the same research design as well as the place and time of the intervention. The treatment samples and the outcomes of interest are, however, different: whereas that study analyzed the effects on vaccination of an intervention that targeted households with children less than

☆ We acknowledge financial help from the Inter-American Development Bank. Julian Cristia and Sarah Humpage worked, jointly with Matias Busso, in running the field experiment. The opinions expressed here are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.

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https://doi.org/10.1016/j.econlet.2017.09.018

five years old, this paper reports the effects on prenatal care of an intervention that targeted households with pregnant women.

2. Setting

Guatemala is a small middle-income economy with a GDP per capita of US$ 7700 in 2015. Table 1 presents some basic socio-economic indicators. The country has relatively high rates of poverty, chronic malnutrition as well as infant, child and maternal mortality. These indicators are even worse in rural areas, where the experiment took place. This is not surprising given that, traditionally, Guatemala's rural population has had limited access to modern medical services. To reach these populations the government established in the mid-1990s the Coverage Extension Program (PEC, for its name in Spanish). The program provides free basic health care services to children under the age of five and women of reproductive age, with a focus on preventive care. At the time of the study, the program covered approximately one third of the population of Guatemala. This population is widely dispersed living in isolated small communities.

To provide PEC services the Ministry of Health hires local NGOs that operate a network of clinics—which consist of simple stand-alone structures. All clinics in our study are part of the PEC program. Mobile medical teams visit each clinic once a month. Community health workers support the mobile medical teams by conducting outreach in their communities. Health workers are expected to track individuals to be able to inform them every month whether they should attend the mobile medical team's visit.

The PEC has an electronic medical record system in place. Members of the mobile medical team record the services they provide to each patient on paper-based patient charts, which are generally located at the clinic. After the visit, the mobile medical team brings any updated charts to the NGO office, where data entry assistants update the medical record system. The mobile medical team then returns the paper charts to the clinic on their next visit. The data housed in the medical record system are used to generate aggregate statistics. The data are not used to support community health workers in their efforts to track individuals.

3. Experiment

Data. The main source of data in this study is PEC's electronic medical record system. In the case of pregnant women recorded information includes basic socio-demographic data and health profiles (vaccination, number and frequency of medical check-ups, and number of births). These data cover all women who were pregnant at some point between August 2011 and January 2012 in the communities under study. The use of administrative records to assess effects on prenatal care allows us to detect small effects because of the large sample size involved. In addition, we also collected baseline and endline surveys data from all community health workers. There is roughly 1 clinic per community and 1.4 community health workers per clinic.

Intervention. The intervention was implemented by three NGOs operating in four areas of the country (Sacatepéquez, Chimaltenango, El Estor and Morales). Jointly with these NGOs we developed an intervention that utilizes the PEC's administrative records to generate lists of pregnant women that were due for prenatal check-ups. The lists included detailed information identifying women who needed these check-ups. Community health workers were trained to use these lists to give specific and timely reminders to women in treated communities. The lists were distributed to community health workers at monthly meetings at the NGO offices, along with information on the medical team's upcoming visit to their clinic. In contrast, community health workers in the control group clinics had to attempt to track patients in their coverage area on their own, if they chose to do so at all. While health workers in all PEC communities are expected to provide some kind of reminder, health workers in treatment communities received concise, up-to-date information on which women to remind, whereas health workers in control communities had to rely on their own records, which they may or may not have created and maintained.

The clinics in our sample covered between 2 and 72 pregnant women and an average of 18 women per clinic during the intervention period. In a typical prenatal care visit in these rural areas women reported receiving several health care services (see Table 2). Most of them were weighted, had their blood pressure and their abdominal circumference measured, did a urine test, and were given vitamins and food supplements. A smaller proportion of them were given a tetanus shot, a blood test, or had their baby's health assessed with an echography. At the due date, the delivery typically happened in a community center and only a small proportion of them were done in a health center or a hospital.

Study design. A randomized controlled trial was implemented to evaluate the effects of the intervention on pregnant women's take up of prenatal care visits. The outcome of interest is an indicator variable equal to one if a woman had a prenatal check-up. Treatment was randomly assigned at the clinic level within strata (a total of 130 clinics are part of the study).[1] These strata were constructed by interacting the jurisdiction, a geographic grouping of clinics, and community health workers' use of any type of patient lists at baseline.

4. Results

Balance. Clinics and women in the treatment and control groups are similar in terms of observable characteristics. Panel A in Fig. 1 shows pre-treatment sample means of relevant covariates and the *p*-values of t-tests of the differences in these means between treatment and control groups. Overall these differences are small and not statistically significant.

Compliance. Panel B in Fig. 1 shows some community health workers' survey responses at endline. Not all health workers in the treatment group received the patients' lists. On average, 63.5% of community health workers from clinics assigned to the treatment group indicated that they received the new lists, compared to 14.1% of community health workers from clinics assigned to the control group. There is reason to believe that most of these health workers in the control group did not actually receive the lists, but were referring to some other type of list when answering the question.

Results. We estimate our results using a specification that includes an indicator variable for the clinic-level treatment, randomization strata, women's age, and her expected delivery date. Standard errors are clustered at the clinic level and *p*-values are adjusted for multiple testing using Holm (1979) step-down procedure. Because not all community health workers in the treatment group received the patients' lists we interpret the OLS estimates as an intention-to-treat effect (ITT). We also estimate the local average treatment effect (LATE) using two-stage least squares in which the exogenous treatment assignment indicator is used to instrument an indicator variable equal to one if the community health worker received the patient's lists.

Panel A of Table 3 shows the main results. The reminders had a positive and statistically significant effect on prenatal check-ups six months before delivery, increasing the probability of assisting

[1] Initially, we randomly assigned 167 clinics to treatment and control groups. However, we had to drop 12 clinics because administrative records at endline could not be extracted due to software-related issues and, additionally, we dropped 25 clinics for which we did not have community health workers' endline data. The final sample includes 130 clinics in roughly the same number of communities. See Busso et al. (2015) for details.