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Working Paper

Empowering IDPs with SMS: A Randomized Controlled Trial in Bogota

IDB Working Paper Series, No. IDB-WP-222

Provided in Cooperation with:

Inter-American Development Bank (IDB), Washington, DC

Suggested Citation: Blanco, Mariana; Vargas, Juan F. (2010) : Empowering IDPs with SMS: A Randomized Controlled Trial in Bogota, IDB Working Paper Series, No. IDB-WP-222, Inter-American Development Bank (IDB), Washington, DC

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December 2010

Inter-American Development Bank
December of Research and Chief Economist

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Inter-American Development Bank

2010

Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

Blanco, Mariana.

Empowering IDPs with SMS : A randomized controlled trial in Bogotá / Mariana Blanco, Juan F. Vargas.
p. cm. (IDB working paper series ; 222)

Includes bibliographical references.

1. Internally displaced persons—Colombia—Bogotá—Social conditions. 2. Text messages (Telephone systems)—Social aspects—Colombia—Bogotá. I. Vargas, Juan F. II. Inter-American Development Bank. Research Dept. III. Title. IV. Series.

<http://www.iadb.org>

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Abstract*

A randomized controlled trial was carried out in Bogota, home to the majority of Colombia's internally displaced persons (IDPs), to assess whether the use of short message service (SMS) technology effectively informed this population of its eligibility to receive social benefits. The methodology was to randomly inform half of the sample population's households of their eligibility via SMS and estimate the Local Average Treatment Effect of the text message on the awareness of available benefits. While the findings conclude that on average treated households are more aware of their rights, a more disaggregated analysis suggests there is variation of awareness across benefit type. The analysis further suggests that the intervention was successful in empowering IDPs and indicates that the use of SMS as a policy instrument should be expanded.

JEL Classifications: C93

Keywords: Internally displaced persons, Short message service, Field experiments, Colombia

* We thank Angela Amaya for her assistance and Fernando Barberi, Luis Fernando Gamboa, Clara Ramírez and Manuel Ramírez, for their useful discussion and help. We also are grateful for comments from seminar participants at the Institute for Fiscal Studies (IFS). We are indebted to Alejandro Garnica and Yamile Palacios from Sistemas Especializados de Información (SEI) for their insight and the suggested improvements to the survey instrument.

1. Introduction

Colombia has been entrenched in armed conflict over the last four decades. Scholars locate its origin in *La Violencia*, a period of intense violence between the two traditional political parties from 1946 to 1966.¹ Similar to other Latin American countries, Colombia witnessed the rise of guerrilla movements in the 1960s and 1970s. However, unlike the rest of the region, two of Colombia's armed opposition movements, Revolutionary Armed Forces of Colombia (hereafter known by its acronym in Spanish as FARC) and the National Liberation Army (known by its acronym in Spanish as ELN), are still active to date and their objective is to take over political power.² In addition to the guerrillas the conflict features another illegal armed group since the early 1980s—the paramilitary forces. These right-wing militias were originally formed by local elites, landowners, and drug lords to counteract guerrilla extortion and ransom tactics carried out in the nation's rural zones.

The paramilitaries were effectively composed of small private armies. By the mid-1990s these forces consolidated under the title of the United Self-Defense Forces of Colombia (hereafter known by its acronym in Spanish as AUC), with the aims of bolstering their counterinsurgency strategy. Although the AUC was dismantled between 2003 and 2007 following a peace process initiated by the Uribe Administration, offshoot paramilitary cells, including former AUC fronts, are still active.

The conflict has especially harmed the civilian population, particularly since the emergence of the AUC. Between 1988 and 2005 over 6,100 civilians died in approximately 1,000 killing events perpetrated by the paramilitaries. Two-thirds of the casualties during that period occurred in just one third of the span of AUC's activity from 1997 to 2002 (Vargas, 2009). The strategy of the paramilitaries has not been that of direct attacks or combat with the government or the guerrillas. Instead, the paramilitaries have targeted civilians killing those presumed to support the leftist rebels. Consequently, over 70 percent of the attacks carried out involved targeted killings.

Violence against civilians is a strategy utilized by most armed groups fighting for territorial control (Kalyvas, 2006; Vargas, 2009), and Colombia is not exempt from this pattern. The nation's guerrilla groups also play a major role in security risks posed to the civilian

¹ See Rabassa and Chalk (2001) for a thorough review of the history of the Colombian conflict.

² While ELN is estimated to have about 4,000 combatants, FARC is estimated have over 20,000.

population. Between 1988 and 2005 1,200 civilian deaths were attributed to the guerrilla factions in approximately 200 killing events. While the alleged main objective of the guerillas is to assume political power, their actions have increasingly relied on tactics such as terrorism.

These tactics of the illegal armed groups have resulted in massive numbers of internally displaced persons. Forced displacement has become the most dramatic social consequence of the conflict, affecting up to 90 percent of the country's municipalities.³ Many municipalities that receive IDPs lack the capacity to handle the inflow of refugees. Moreover, 98 percent of displaced households live below the poverty line and face unemployment rates much higher than the rest of the population (Ibáñez and Moya, 2010). In fact, IDPs are among the most vulnerable populations in Colombia. For this reason the United Nations classified this situation in Colombia as “the biggest humanitarian crisis in Western Hemisphere” (UN, 2004).

According to *Acción Social*, Colombia’s governmental agency in charge of social policy and humanitarian aid, by the end of 2009 approximately 3.5 million people had been forcibly displaced from their homes. This represents almost nine percent of the Andean nation’s total population and roughly eight percent of all IDPs worldwide. According to statistics from the UN High Commissioner for Refugees (UNHCR, 2009), Colombia is one of the countries with the highest numbers of IDPs worldwide, together with Iraq and Sudan.

Ibáñez (2009) summarizes the results of a survey administered to approximately 2,300 displaced households in 2004. The author reports that the armed factions primarily responsible for most occurrences of displacement were, first, the guerrillas (46 percent) and, second, the paramilitaries (22 percent). Data confirmed that up to four million acres of land were abandoned by the original owners. This figure represents 3.5 percent of the agricultural sector’s GDP (Ibáñez and Velásquez, 2009).

Presently, Colombia exhibits the most disproportionate land distribution in Latin America. The illegal expropriation of large amounts of acreage is also attributed to the need for arable land for the cultivation of coca, the main element used in the production of cocaine. Reports show Colombia exports approximately 70 percent of the world’s supply (Mejía and Restrepo, 2009). Another key factor in displacement is the extortion of businesses, landowners,

³ Ibáñez (2009) and Ibáñez and Velásquez (2009) report a list of displacement episodes that have caused the majority of a town’s population to flee. For instance, 95 percent of inhabitants left Bojayá, in the department of Chocó. Cocorná, in Antioquia, saw 94 percent of its inhabitants flee, and in El Tarra and Peque 82 percent and 78 percent of the population, respectively, were forcibly displaced.

and farmers by armed groups. It is also noted that this strategy is backed by the forced recruitment of soldiers, especially child soldiers. Finally, another main cause of forced displacement is the intimidation of social and community leaders, which greatly hinders civil resistance. The significance of this repression experienced in this last group is reflected in the fact that two-thirds of IDPs were members of community organizations (Ibáñez, 2009).⁴

The costs of forced displacement are pervasive, thus evidenced by the extensive loss of assets and dissolution of family and community networks.⁵ IDPs are further put at risk by limited access to formal and informal risk-sharing mechanisms, which consequently exposes them to more acute shocks to their personal income and consumption (Ibáñez and Moya, 2010).

In addition, data indicate a substantial overall drop in the welfare of displaced households, despite modest improvements in their status during the years after an occurrence of displacement. This evidence denotes most IDPs will never reach their pre-displacement welfare level. According to NVS-II (2008), 43 percent of displaced households are female-led (50 percent more than the national average), and one fifth of household heads are illiterate. In addition, children and adolescents are at greater risk through a displacement than adults. This group makes up approximately two-thirds of IDPs, and they are heavily economically dependent upon their parents and child labor practices for survival.

1.1 Scope of the Intervention

In recent years the Colombian Constitutional Court has specifically targeted the needs of IDPs. In decree T-025 of 2004, the Court established that IDPs are more vulnerable than the rest of the population and that their basic rights are “largely and systematically violated” and thus require special care and benefits from the government. Despite the government’s attempts to comply with the Court’s mandate by targeting these special benefits, by the end of 2007 the Court had ruled that the rights of IDPs still had not yet fully been reinstated. This results from the new influxes of IDPs that occur daily because of the continued disturbance and interference of armed groups in recent years. However, despite these obstacles our investigation identifies a particular

⁴ However, most of the displacement occurs individually. Around 81 percent of household members flee individually and not en masse (Ibáñez and Moya, 2010). This makes it difficult to identify on a smaller scale the causes of displacement, which goes against the effectiveness of social policy targeted at benefiting IDPs.

⁵NVS-II (2008) estimates that 80 percent of IDPs never return to their households.

mechanism through which a relatively low-cost intervention may boost the efficiency of public policies directed at IDPs.

Law 387 of 1997 created the Unique Registry of Displaced Population (hereafter known by its acronym in Spanish as RUPD). The RUPD, managed by *Acción Social*, constitutes the official account of displaced households nationally and its mission is to assist the government in identifying the recipients of welfare benefits. This legislation established a displaced household has the right to apply for its inclusion in the RUPD. Most applications are submitted upon IDPs' arrival at their new destination. The application requires a detailed account of the facts that precipitated the IDPs' flight, and this information thus enables *Acción Social* to assess whether the household can be included in the RUPD. Subsequent inclusion in the RUPD provides the person/s and their dependents access to a range of benefits.⁶

Nonetheless, this system has several major limitations. First, in order to receive updates about their status an applicant must visit a designated office created for aiding IDPs known as Attention and Orientation Units (hereafter known by the Spanish acronym UAO) Second, the procedures involved are very costly, including transportation costs, long waiting lines, and the implicit loss of income due to consecutive appointments because of information delays. This loss is significant for this population, whose income depends upon labor in the informal sector.

Estimates establish that approximately 70 percent of households included in the RUPD are unaware of their ability to receive benefits. Another contributing factor to the low benefit demands of displaced households is the lack of readily available information about what benefits can be claimed.⁷ To address this problem we carried out a randomized-controlled trial to assess whether a government's communication strategy involving the use of SMS technology could raise awareness about the IDPs RUPD inclusion, along with access to benefits. Hence, the

⁶ Note that inclusion in the RUPD is a necessary condition for receiving benefits. These benefits are demand-driven, and often households have to fulfill additional requirements. For instance, public schools are mandated to offer a place to school-aged children from displaced households. However, this does not always guarantee that the child is actually enrolled in school. Sometimes this is because of a family choice (perhaps a working child is more useful for the household) or because the household does not have enough resources to buy books and/or a uniform.

⁷ During the survey stage of our intervention we collected direct accounts of the experiences of our subjects going to the UAO to obtain information about their status and benefits. One commonality that surfaced was that, in order to be able to obtain the tickets authorizing attention at the UAO customer service windows, IDPs have to arrive the night before and maintain their place in line overnight. Some IDPs cannot afford transportation costs to UAOs (of which there are only five in Bogota). Yet another group cannot leave their job to go to the UAO or have no one who can take care of their children in the meanwhile. Among those who can make it to the UAO, once they finally reach the service window they are often told to come back some other day because their information is not yet loaded into the system. Sometimes personnel at UAOs simply are not aware of the information requested on how to access certain benefit—or are simply unwilling to provide it.

objective of this experiment was to corroborate the hypothesis that information and communication technologies (ICTs), such as SMS could empower Colombia's IDP population to better emerge from their precarious situation.

1.2 Outline of the Paper

The paper is organized in the following manner. Section 2 describes the experimental design, and Section 3 reports the main results of the intervention. In this section we provide evidence that the intervention was successful in improving IDPs' awareness of their inclusion in the RUPD and the benefits that accompany inclusion. Section 4 discusses various obstacles we encountered during the intervention. Finally, Section 5 summarized our investigations and details future work and policy recommendations that could result from this research.

2. Experimental Design

This experiment was composed of the transmission of simple, automatic alert messages directed to the registered cell phones of the displaced household upon inclusion by *Acción Social* to the RUPD.^{8,9,10} IDP households assigned to the control group had to follow the regular procedure (i.e., arrive at UAO center and wait to be assisted) in order to be informed of the status of their application. Lastly, a post-intervention survey, described in Section 2.3, was then conducted in order to evaluate the impact of the SMS strategy on IDP households' awareness of their inclusion in the RUPD and their entitlement to benefits.

2.1 Implementation

The entire intervention was executed during six months in coordination with *Acción Social*. It occurred between September 2009 and February 2010, and a survey was subsequently carried out between March and May 2010. *Acción Social's* involvement in this experiment was twofold

⁸ It is estimated that over 98 percent of displaced households have cell phones (NVS-II, 2008). This is because penetration of mobile telecommunications is very large in developing countries, especially in the case of our target population.

⁹ The SMS text sent to treated households was the following: *ACCIÓN SOCIAL informa: Ha sido incluido en el Registro Único de Población Desplazada, favor acercarse a la UAO más cercana para mayor información.*

¹⁰ A second SMS reminder that RUPD inclusion entitled them to benefits was also sent to half of those receiving the baseline treatment. However due to the reduced sample of subjects taking part in the follow-up survey who actually received this second message, we have no power to analyze the impact of this additional piece of information. Section 2.2 gives details of the reasons of sample loss we faced throughout the intervention and assesses whether this is likely to generate any bias.

and took place both at the beginning and the end of the implementation phase. First, the agency provided us with the data on the newly included IDPs in the RUPD. These data were then used to allocate households randomly into treatment and control groups. Second, after we assigned households into treatment and control groups, the agency transmitted the SMS to the treated subjects.

Unfortunately, our relationship with the agency presented some challenges. Initially, *Acción Social* was enthusiastic and committed during the design phase. However, it later displayed a level of negligence, which subjected us to long delays during the implementation phase and a significant loss of the sample population. This was further compounded by the agency's total authority over the management of the RUPD. This made us totally dependent on them and their timing, thus compromising the intervention's effectiveness. These obstacles are detailed in Section 4 below, and the lessons learned can be referenced for future projects of this sort that involve the collaboration of government agencies.

2.2 Sample Issues

2.2.1 Miscalculation

At the beginning of the intervention we estimated that by the end of the evaluation we would have access to a sample of about 1,200 displaced households. Conversely, the actual sample of surveyed households ended up being 218, less than 20 percent of the target (see Table 1). The reduction is attributed to two factors. First, there was a lower flow of IDPs arriving in Bogota, which directly affected their ability to declare their status to the relevant officials. Based on figures provided by *Acción Social* officials during the experiment design stage, we estimated a lower bound of 7,000 households would declare their status in Bogota during the six months of the planned intervention.¹¹ However, as reported in column (1) of Table 1, the actual number of households that declared was 4,108, which represents about 60 percent of the expected total.

But there was an additional miscalculation of *Acción Social*. During the design stage the agency claimed an average inclusion rate of IDP households in RUPD of 70 percent, as shown in column (2) of Table 1. As a result, given the actual number of households that declared (4,108), we expected a sample of about 2,875 included households. However the observed number was

¹¹*Acción Social* reported an average of 250-300 new households arriving in Bogotá weekly

1,433, which indicates an *ex post* acceptance rate of *Acción Social* of half of what the agency had estimated.

Table 1: Difference Between Estimated and Actual Sample

	Declarants	Included	Consent	After attrition
Estimated	7,000	4,900 70%	2,450 50%	1,225 50%
Realized	4,108	1,433 35%	607 42%	218 36%
Loss	2,892	3,467	1,353	958

Source: Authors' compilation.

2.2.2 Consent Form

Given IDPs' vulnerable status in Colombia, the country's Attorney General Office mandated that any official wishing to contact displaced individuals by cell phone or any other means must first have their written consent. As a result, we staged a pre-intervention phase whereby we provided every office receiving inclusion applications in Bogotá with a package of consent forms.¹² The consent form (an example is attached in Appendix B), was to be attached to the displacement declaration form and returned to *Acción Social*, which in turn would forward it to our research team in order to select from the RUPD only those who had consented. On the other hand, we were not permitted to contact by SMS those who did not consent.

We conservatively estimated a consent rate of 50 percent. The complex logistics involved in the distribution of consent forms throughout the city and the training of officials receiving declarations factored into this low estimate. The estimate was reasonably accurate, as the actual consent rate was 42 percent (refer to column (3) of Table 1).

¹² The number of forms provided was based on estimated flow of IDPs to each office.

2.2.3 Attrition

Another element that further compounded the highly reduced sample size was the attrition rate. A high attrition rate was expected due to two reasons. First, IDP households migrate at a higher rate than other populations, which makes them difficult for survey teams to locate. For example, IDPs tend to declare their status in the first location they reach following displacement. This can be misleading, however, as many IDPs do not stay long-term at this first location: The spontaneous nature of forced displacement usually causes this population to flee to the nearest safe area (usually urban centers), which is not necessarily where the household will settle on a permanent basis.

Second, the communication medium used during the experiment, cell phones, reduced the effectiveness of the results. We found that IDPs' cell phones were often shared among family and neighbors, and often lost. We considered this potentially be a detriment to data reliability. In fact, our estimated attrition rate of 50 percent fell short of the actual attrition rate of 60 percent (see column (4) of Table 1).

During the survey stage, qualitative results illustrated the most common reasons for attrition as the following:

Outdated contact details included in the consent form. In several instances the registered cell phone was not in service or calls were forwarded automatically to the mailbox, or the cell phone was registered under an unrelated name. Upon visiting registered addresses, the survey team often discovered that the sample subjects either had left or had never resided there.

Mobility of IDPs. Due to budget constraints and the narrow scope of the trial in Bogotá our survey team was not able to track subjects that had moved to other locations.

Appointment defectors. The survey team encountered numerous IDPs who reneged on their interview appointments. The two contributing factors were IDPs' inability to leave work and the provision of false addresses. The former is a direct result of IDPs' employment instability and the informal job sectors in which they work. The latter stems from distrust and their suspicion based on their prior victimization.

2.2.4 Unbiased Loss

As mentioned above, the complex characteristics of the experiment and especially the unanticipated unreliability of our government counterpart, *Acción Social*, drastically reduced the sample population. This section, however, provides data suggesting that the reduction the sample suffered (summarized in Table (1)) is not likely to have produced any significant bias in the estimates reported in Section (3).

The database provided by *Acción Social* during the first stage of the intervention contained the following: i) the full list of declarants who had arrived in Bogotá during the period of intervention,¹³ ii) information on those who were and were not included, and iii) information on the consent form. This was the basic input needed to perform the randomization and generate the list of declarant+included+consenting IDPs to receive the SMS alert. Moreover, we also requested that a set of baseline characteristics be included for the entire sample; however, only a minimal amount (four) was obtained. Subsequently, we used these four baseline variables to corroborate the evidence of systematic differences between the population sub-samples of the different stages that caused the dilution of the sample.

The first baseline variable collected was the gender of the household representative declaring IDP status. Panel (a) of Table 2 shows the number of women among the declarants who were included and not included in the RUPD. More than half of all declarants were women, which is consistent with the aforementioned fact that women largely head IDP households. Moreover, the proportion of females is very similar between the included and the unincluded, and a t-test establishes that the 1.7 percentage point difference is not significant at conventional levels.¹⁴

On the other hand, panel (b) of Table 2 limits the analysis to the sample of included IDPs and compares the share of females between those declarants who consented and those who did not. The result was only a non-significant 0.3 percentage point difference. Finally, panel (c) examines the sample of included IDPs who consented and assesses potential biases caused by attrition by comparing the share of women who participated in the follow-up survey to those who

¹³*Acción Social* has no information on non-declarant IDPs and does not consider them to be displaced.

¹⁴Note however that in general the difference between RUPD-included and non-included IDP, in terms of certain baseline characteristics, should not be expected to be statistically indistinguishable from zero. This owes to the fact that inclusion is not random and responds to a particular set of criteria applied by *Acción Social*.

were not located for an interview. The difference in this case is somewhat larger (6.7 percentage points) but still not significant.

Table 2: Differences in Declarant's Gender Across Samples (share of female)

Panel A: *RUPD-included vs. not included*

Included	Not included	Difference
0.561	0.543	0.017
(0.013)	(0.010)	(0.016)

Panel B: *Consent vs. no consent (within included)*

Consent	No consent	Difference
0.563	0.559	0.003
(0.020)	(0.017)	(0.027)

Panel C: *Interviewed vs. not found (within included & given consent)*

Interviewed	Not found	Difference
0.606	0.539	0.067
(0.033)	(0.025)	(0.042)

Source: Authors' compilation.

Table 3 repeats the exercise of Table 2 but analyzes the average number of beneficiaries per declaration.¹⁵ Panel (a) illustrates that *Acción Social* tends to include households with fewer beneficiaries on average. While the average number of beneficiaries for included households is 2.1, that of not-included households is almost 2.3, and the difference is significant at the 10 percent level. This is, however, not a problem because the differences between included and unincluded households can neither be controlled by us nor forms a part of our main investigation. Furthermore, these differences are dependent upon the particular guidelines for inclusion in *Acción Social*.

¹⁵ Every declarant includes in his or her declaration a certain number of beneficiaries comprised of the number of household members who fled together and for whom the facts reported in the declaration apply.

Contrarily, what were of importance to us, in terms of bias that may be associated with the sample reduction, are the differences between households who consented and those who did not. In addition, we also were interested in the differences between the surveyed households and those not located for the interview. Panels (b) and (c) of Table 3 confirm there are no significant differences in the number of beneficiaries in either case.

Table 3: Differences in the Number of Beneficiaries per Declarant Across Samples

<i>Panel A: RUPD-included vs. not included</i>		
Included	Not included	Difference
2.105	2.267	-0.162
(0.066)	(0.047)	(0.083)*

<i>Panel B: Consent vs. no consent (within included)</i>		
Consent	No consent	Difference
2.163	2.043	0.120
(0.088)	(0.099)	(0.132)

<i>Panel C: Interviewed vs. not found (within included & given consent)</i>		
Interviewed	Not found	Difference
2.235	2.123	0.111
(0.154)	(0.107)	(0.184)

Source: Authors' compilation.

Differences across samples for two other variables: “region of origin of the IDP” and “cause of displacement” are reported in Appendix A. With regard to region of origin, the only significant difference is that between those included in the RUPD and those who were not (Table A-9).¹⁶ We did not deem this a problem because the inclusion process is entirely under the authority of *Acción Social* and analyzing its determinants was not part of this paper. More importantly, there are no significant differences in the region of origin between the IDPs who

¹⁶ The statistic of the non-parametric chi-squared test (with 32 degrees of freedom) is 93.741 with *p-value* of 0.000.

signed the consent form and those who did not, and between those who were located for the interview and those who were not (Tables A-10 and A-11 respectively).

We report similar results for the case of cause of displacement. However, the only significant difference is found between those included and those not (Table A-12).¹⁷ In the other cases we cannot reject the null hypothesis that the samples come from the same distribution of “causes” (Tables A-13 and A-14 respectively).

2.3 Follow-up Survey

We found no reliable or comprehensive official information system with which to monitor awareness and subsequent appropriation of social benefits by included IDPs. Therefore we conducted a follow-up survey to identify whether the use of SMS to communicate inclusion in the RUPD had a significant impact on benefit awareness and knowledge.

Our methodology consisted of a pilot run executed on March 12 and 13, 2010 that allowed us to adjust the original questionnaire (see Section 2.3.1 below and assess the length of the interview. Then the fieldwork took place between April 7th and May 19th 2010. Of the 218 households (902 people) surveyed, exactly half were treated and half belonged to the control group. Since the number of survey respondents was not fixed by us seeking to maintain a balanced sample, the fact that the originally assigned proportions of treated and controlled remained unchanged further supports the findings that attrition rates are not systematically related to the treatment status. Therefore, we firmly assert our results are not biased.

2.3.1 Questionnaire

In order to measure the impact of the SMS intervention on the awareness and receipt of benefits our survey includes questions regarding: i) whether households knew they were included in the RUPD,¹⁸ ii) whether they knew some or any of the benefits to which they were entitled, and iii) whether they had actually claimed any of them. In addition, we included a complete set of questions that allow us to build a demographic profile of the displaced household, which we use as controls in our empirical analysis (Section 3).

¹⁷ The statistic of the chi-squared test (14) is 51.067 (p -value = 0.000).

¹⁸ We cannot guarantee that text messages sent to the registered cell phones of treated households will actually be received and read by the target party. Thus with the answer to this question we are able to measure *compliance* and then apply instrumental variable methods to compute the *causal effect* of being assigned to treatment on awareness and take-up of benefits.

The complete questionnaire is divided into eight parts and includes the following issues: verification of the IDPs' condition and information about displacement (Part I); questions that characterize the current and prior living conditions and compares them (Part II); questions that characterize the household with all its members, including human capital (education and health conditions) and employment status (Part III); questions on awareness of and access to social benefits (Part IV); questions on asset ownership (Part V); questions on social capital (Part VI); questions on cell phone and SMS access and literacy (Part VII); and questions on civic participation (Part VIII). The questionnaire is comprehensive and thus allows us not only to assess the general impact of the use of SMS (Part IV), but also to study the determinants of differential impact rates (Parts II, III, V and VI), and the mechanisms behind our results (Part VII).

3. Results

3.1 Descriptive Statistics

Table (4) underlines that the randomization was successful in generating no significant difference between treated and controlled households in terms of a full battery of variables. We divide these into four categories: i) cause of displacement, ii) perpetrator, iii) household characteristics, and iv) declarant characteristics. Since the t-tests reveal no significant difference between treated and control units in any of the observable pre-treatment characteristics, the *ignorability* assumption of the Rubin Causal Model (Rubin, 1974) holds. Moreover, given that every unit had an equal chance of receiving treatment *a priori*, we believe that the effect of the SMS treatment on the post-treatment outcome variables is indeed *causal*.

3.2 Treatment Effect

Panel (a) of Table 5 compares the inclusion awareness of treated and control units. This outcome was constructed from respondents' answers to the question: "*Do you know if you have been included in the RUPD?*" While 86 percent of treated households confirmed their awareness of being included, only 71 percent of the control did (recall that for a household to be in our sample it had to be included in the RUPD). The 15 percentage point difference is significant at the 1 percent level.

Given *ignorability* (see Table 4), the mean-difference is a good estimate of the causal effect. However, the regression counterpart of this comparison is useful insofar as adding controls helps to improve the statistical precision of the estimate (Angrist and Pischke, 2008). Table (6) reports the Probit estimates of the impact the treatment had on RUPD-inclusion awareness. While the estimate presented in column (1) includes no controls, columns (2) through (5) include all the controls described in Table 4 one extra category at a time. Column (2) includes controls regarding the cause of displacement, while column (3) adds perpetrator dummies. Lastly, columns (4) and (5) add household and declarant characteristics, respectively. In all cases the estimate of the causal effect is positive and significant at the 1 percent level. The magnitude of the coefficient indicates that the treatment increases the awareness of inclusion by 10 percent.

We deem the positive and robust effect of the treatment on the awareness of inclusion in the RUPD as favorable in two ways. First, sending an SMS alert is a very inexpensive policy intervention to which practically all sample members have access. Second, increasing awareness of entitlement benefits is the first step in improving IDPs' overall welfare. Using these data, we can explore whether the impact of the intervention goes further in achieving this more ambitious objective by looking at the awareness of the different benefits they are allowed to request upon RUPD inclusion.

Panel (b) of Table 5 takes an initial look at this impact by showing the different benefit awareness rates of treated and controlled households. For conciseness in the analysis and illustration we aggregate the full set of Emergency Humanitarian Help (EHH) benefits (Decree 2569 of 2000) in the five following indicators: i) *Medical care* aggregates the right to medical assessment, psychological assessment, emergency medical care, and medicines; ii) *Food*, the right to receive food supplies; iii) *Housing* aggregates temporary housing and rent subsidy; iv) *Supplies* aggregates kitchen and cleaning supplies, beds and mattresses and clothing; and v) *All* aggregates the previous four indicators.

Columns (1), (2) and (3) of Table 5 (Panel b) compare awareness across treatment status. As it turns out, the only significant difference (at the 10 percent level) is that of *Medical Care*. Treated households are six percentage points more aware than the control of their right to request benefits related to medical care.

Table 4: Descriptive Statistics

	Treated (N=109)	Control (N=109)	Difference
Panel A: Cause of displacement			
Threats	0.798 (0.039)	0.734 (0.043)	0.064 (0.057)
Killings	0.092 (0.028)	0.11 (0.03)	-0.018 (0.041)
Attack to town	0.009 (0.009)	0.018 (0.013)	-0.009 (0.016)
Forced recruitment	0.083 (0.026)	0.083 (0.026)	0.000 (0.037)
Other	0.018 (0.013)	0.055 (0.022)	-0.018 (0.025)
Panel B: Perpetrator			
Paramilitaries	0.266 (0.013)	0.33 (0.015)	-0.064 (0.062)
Guerrillas	0.624 (0.047)	0.642 (0.046)	-0.037 (0.066)
Not known	0.128 (0.032)	0.073 (0.025)	0.055 (0.041)
Panel C: Household characteristics			
Size	3.624 (0.194)	3.991 (0.246)	-0.367 (0.314)
No. displacement episodes	1.202 (0.052)	1.239 (0.055)	-0.037 (0.076)
Assets prior to disp	0.633 (0.046)	0.679 (0.045)	-0.046 (0.065)
Ethnicity: Afro-Colombian	0.064 (0.024)	0.092 (0.028)	-0.028 (0.036)
Ethnicity: Indigenous	0.046 (0.02)	0.046 (0.02)	0.000 (0.028)
Ethnicity: Other	0.89 (0.03)	0.862 (0.033)	0.028 (0.045)
Panel D: Declarant's characteristics			
Sex (1=woman)	0.633 (0.046)	0.606 (0.047)	0.028 (0.066)
Age	36.972 (1.267)	36.11 (1.16)	0.862 (1.718)
Education	2.358 (0.134)	2.367 (0.137)	-0.009 (0.192)
Community network	0.037 (0.018)	0.055 (0.022)	-0.018 (0.028)

Source: Authors' compilation.

Table 5: Inclusion and benefit awareness

	By treatment status			By inclusion awareness		
	Treated (1)	Control (2)	Difference (3)	Treated (4)	Control (5)	Difference (6)
Panel A: RUPD-inclusion						
	0.862 (0.008)	0.716 (0.010)	0.146 (0.012)***			
Panel B: Benefits awareness						
All	0.336 (0.014)	0.314 (0.013)	0.023 (0.019)	0.350 (0.011)	0.231 (0.019)	0.119 (0.023)***
Medical care	0.489 (0.024)	0.433 (0.024)	0.055 (0.034)*	0.483 (0.019)	0.380 (0.036)	0.102 (0.017)***
Food	0.523 (0.048)	0.569 (0.048)	-0.046 (0.068)	0.581 (0.038)	0.413 (0.073)	0.168 (0.082)**
Housing	0.436 (0.034)	0.385 (0.033)	0.050 (0.047)	0.459 (0.027)	0.228 (0.044)	0.231 (0.057)***
Supplies	0.087 (0.014)	0.094 (0.014)	-0.007 (0.019)	0.105 (0.012)	0.038 (0.014)	0.067 (0.024)***

Notes: * Significant at 10%, ** significant at 5%, *** significant at 1%.

Source: Authors' compilation.

Table 6: Effect of treatment on inclusion awareness – Probit regression

Treatment	0.217 (0.030)***	0.229 (0.030)***	0.231 (0.030)***	0.252 (0.030)***	0.253 (0.030)***
<i>Controls</i>					
Cause of disp.		✓	✓	✓	✓
Perpetrator			✓	✓	✓
Houschols charact.				✓	✓
Declarant charact.					✓

Notes: * Significant at 10%, ** significant at 5%, *** significant at 1%.

Robust standard errors in parentheses

Source: Authors' compilation.

The fact that the difference is not significant for the rest of benefit indicators may be due to non-compliance. Indeed, for the reasons explained above related with the nature of the target population, it is very likely that a relevant share of treated households had not received the SMS. This is partially confirmed by the large (64 percent) attrition rate (see Table (1)), which indicates that many cell phones were lost or not carried by the subjects. To explore this further, columns (4), (5) and (6) of Table 5 investigate the differences in benefit-awareness products by the self-reported awareness of inclusion in the RUPD. The difference reported in column (6) suggests that households aware of inclusion (recall that all households in our sample are included) are on average much more aware of their rights than households unaware of their inclusion (up to 23 percentage points in the case of housing).

The stark differences between column (3) and column (6) suggest that an IV-type empirical approach should be implemented. The OLS counterpart of column (6) would be biased because awareness of RUPD inclusion is likely to be correlated with unobservables that also affect knowledge of benefits. Suppose that the causal effect of inclusion (W) on the knowledge of benefits (Y) is given by the parameter θ in the regression

$$Y = \alpha + \theta W + \varepsilon$$

How can the causal effect be estimated? Define Z as the treatment assignment: $Z=1$ for treated households and $Z=0$ for control. Then the expected value of Y , given $Z=1$ is

$$\begin{aligned} E(Y|Z = 1) &= E(\alpha|Z = 1) + \theta E(W|Z = 1) + E(\varepsilon|Z = 1) \\ &= \alpha + \theta E(W|Z = 1) \end{aligned}$$

and that given $Z=0$,

$$\begin{aligned} E(Y|Z = 0) &= E(\alpha|Z = 0) + \theta E(W|Z = 0) + E(\varepsilon|Z = 0) \\ &= \alpha + \theta E(W|Z = 0) \end{aligned}$$

Subtracting the two equations yields

$$E(Y|Z = 1) - E(Y|Z = 0) = \theta E(W|Z = 1) - E(W|Z = 0)$$

and hence an estimate for the causal effect follows directly:

$$\hat{\theta} = \frac{\hat{E}(Y|Z = 1) - \hat{E}(Y|Z = 0)}{\hat{E}(W|Z = 1) - \hat{E}(W|Z = 0)}$$

So the IV estimate of the causal effect is in essence the ratio of the mean difference of the rate of benefit knowledge to the mean difference of inclusion awareness, with both differences computed across treatment status. This IV estimator is called the *Wald* estimator, and it holds in cases like ours, when the instrument is *binary*. It is also noteworthy that the estimate needs the denominator being non-zero:

$$E(W|Z = 1) \neq E(W|Z = 0)$$

This means that the treatment status must be a good instrument for inclusion awareness, something which we know is true, as shown by panel (a) of Table 5 and by Table 6. The causal effect computed this way is called Local Average Treatment Effect (LATE), and it provides information only on the impact of the treatment on the IDP households affected by the instrument.

Table (7) reports the results for the five sets of benefits as defined above. All regressions include the full set of controls and report robust standard errors. Importantly, the treatment increases significantly (at the 10 percent level) the awareness of the aggregate of all benefits. The economic magnitude of the IV-Probit coefficient suggests that treatment increases awareness by 25 percent. This is, however, driven by the large and positive impact of the treatment of the awareness of *Medical care* benefits. Treatment increases IDPs' awareness of the right to *Medical care* by 45 percent (significant with 95 percent confidence).

Treatment does not increase awareness of the right to *Food*, *Supplies*, or *Housing*, although the effect of the latter is positive and marginally significant at the 10% level (p-value = 0.11).¹⁹

¹⁹We do not analyze the effect of treatment on the *take-up* of the different benefits. The reason for this is the fact that while awareness can be influenced by an improvement on communication, the actual request of benefits is a choice of the IDP. Therefore the relevant variable to observe is awareness.

Table 7: Effect of treatment on benefits awareness – Wald estimator

	All benefits	Medical care	Food	Housing	Supplies
IV-Inclusion awareness	0.621 (0.360)*	1.136 (0.502)**	-0.651 (1.073)	1.191 (0.747)	-0.086 (0.841)
<i>Controls</i> ✓					

Notes: * Significant at 10%, ** significant at 5%, *** significant at 1%.

Robust standard errors in parentheses

Source: Authors' compilation.

4. Problems and Intervention Limitations

During the implementation phase of the project we encountered several issues that forced us to slightly depart from the original experimental design and cut the expected sample size substantially. In this section we present these issues and their impact on the development of the project.

Most of the problems encountered are related to the fact that we worked with a government partner, *Acción Social*. In general, the implementation of new policies and interventions, even at the stage of randomized-controlled pilots like ours, requires several bureaucratic processes prior to approval. As a result, the start of implementation was substantially delayed.

4.1 Dealing with Government Counterparts

In order to develop the project with our main counterpart institution a confidentiality agreement was required wherein *Universidad del Rosario* committed to preserve the confidentiality of the information provided by. *Acción Social* demanded such an agreement, arguing this would speed up the process of internal approval within the institution. In response, the university provided all documentation requested in a timely fashion. However, the agreement was not finalized until three months later, and it was finally signed on May 27, 2009.

Another determinant in the delayed project implementation was the resignation of the director of *Acción Social* in early June 2009. Therefore, a lapse in leadership lasted from early June to late July 2009. This transition affected the job security of many of the agency's staff, which further delayed the implementation phase.

4.1.1 Consent Form

As explained in Section 2.2, because of legal constraints we could not contact IDPs by phone (nor send SMS) without their written consent. Therefore, in order to obtain consent we had to collaborate with official institutions other than *Acción Social*, that were responsible for receiving displacement declarations upon the arrival of IDPs at new locations. This declaration could take place in any of the following institutions: the *Personería*, the *Defensoría*, and the *Procuraduría*.²⁰

Unfortunately, not all offices worked proactively to obtain declarants' consent. Table 8 illustrates the large differences in the performance of the 29 entities receiving the IDPs declarations and collecting their consent forms. Table 8 highlights two important points to be noted. First, the declarants are evenly dispersed across the 29 offices in which they could declare. Second, there is large variation in efforts to obtain the consent of the declarant via his or her cell phone. We detected this pattern early in the implementation stage, yet we were unsuccessful in changing it.

This trend was in part due to the orders of the chief coordinator over all these offices. He stipulated that a simple written instruction from his office was sufficient to guarantee compliance with declarants' consent. As a result we were prohibited from making visits to raise awareness among offices with low performance.

To counter this, our efforts only enabled us to participate in the coordination meetings attend by the managers of all the involved offices. On this occasion we had the chance to explain to them their fundamental role in our intervention. Consequently, they were informed of the potential policy recommendations that could result from this exercise and improve the welfare of IDPs. Upon discussing the positive impact our experiment would have, unforeseen difficulties arose with *Acción Social*.²¹

²⁰ Recall that the Registry Office of *Acción Social* then assesses displacement declarations. There it is decided whether declarants are included in the RUPD. Only after such declaration are the displaced households entitled to a series of benefits.

²¹ The Registry Office of *Acción Social* outsourced the data-entry of the declaration form and the decision of RUPD inclusion to firms. Training the firms to digitize the consent form implied a learning curve. As of December 1, 2009, the contract with the initial outsourced firm expired. The bidding process to hire a new firm took much longer than what *Acción Social* told us. So for two months the digitalization was done by the Registry Office itself, which implied major delays in our obtaining the information in the consent forms. However, once the firm started operations in February 2010 much of the overdue digitalization work was completed.

Table 8: Declarants and Consent Rate by Entity

Entity	% Declarants	Consent rate
Defensoría del Pueblo	6	30
Per. Antonio Nariño	1	23
Per. Barrios Unidos	1	0
Per. Bosa	6	36
Per. Candelaria	1	19
Per. Chapinero	1	43
Per. Ciudad Bolívar	5	40
Per. Derechos Humanos	0.1	0
Per. Engativa	3	24
Per. Fontibón	2	10
Per. Kennedy	3	31
Per. Martires	2	0
Per. Puente Aranda	0.3	0
Per. Rafael Uribe Uribe	4	0
Per. San Cristóbal	4	0
Per. Santa Fe	2	57
Per. Suba	7	1
Per. Sumapaz	0.3	73
Per. Teusaquillo	0.5	3
Per. Tunjuelito	2	3
Per. Uao Bosa	5	60
Per. Uao Ciudad Bolívar	8	15
Per. Uao Puentearanda	11	57
Per. Uao San Cristóbal	5	35
Per. Uao Suba	9	53
Per. Uao Terminal Terrestre	3	35
Per. Usaquén	1	1
Per. Usme	3	63
Procuraduría	6	23

Source: Authors' compilation.

4.2 Lessons Learned

We have learned several lessons through this experiment that will be taken into consideration for subsequent investigations of this nature. Regardless of prior theoretical academic knowledge of randomized evaluations, methodologies for causal inference, and policy implications, partnering with a government agency can be disadvantageous.

In our case all the difficulties detailed in this section significantly delayed the intervention and greatly lowered the statistical effectiveness of the results. One possible remedy would be for the official partner to contract the intervention. In this case we would expect the government counterpart to have more incentive to support the success of the experimental trial.

However, in our case *Acción Social* was not a true stakeholder in the intervention. Despite the potential for beneficial policy recommendations for IDPs, it became clear that this was not a sufficient motivation. In general, we argue *ex post* that this type of intervention with any bureaucracy will be accompanied with periodic impediments. Based on this precedent, it is recommended that future project design of this nature should include flexible deadlines for the submission of deliverables to funding institutions.

5. Conclusion

We presented evidence from a randomized-controlled trial that the use of SMS as a channel to improve the communication between the government and beneficiaries of social programs can empower vulnerable populations and substantially increase their welfare. In this respect, we conclude that SMS represents a potentially effective instrument for social policy.

Our findings are specific to the Colombia context, a country that has experienced internal conflict for 40 years and has the world's largest IDP population. We demonstrate that an inexpensive intervention such as SMS directed to vulnerable households increases awareness of their entitlement to social benefits.

The significance of our results, coupled with the low intervention costs, provides a strong argument for the inclusion of this research in policymaking under Colombia's new administration. The present is an opportune time for more experimental pilots to be replicated nationwide. The purpose of this strategic approach would ensure the increase of social benefits available to IDPs. Undoubtedly, this issue would be high on the government's social policy

agenda. This argument is supported by the Colombian Constitutional Court's recent role as a committed advocate of the rights of IDPs.

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Appendix A. Further Sample Comparisons

Table A-9: Differences in region of origin: RUPD-included vs. not included

Region	RUPD-included	Not-included	Difference
Amazonas	0.28	0.13	0.15
Antioquia	8.11	5.94	2.17
Arauca	2.24	1.36	0.88
Atlántico	0.84	1.49	-0.65
Bogotá	0.42	1.87	-1.45
Bolívar	2.38	4.59	-2.21
Boyacá	1.26	2.33	-1.07
Caldas	1.12	3.29	-2.18
Caquetá	5.45	3.75	1.71
Casanare	0.56	0.84	-0.28
Cauca	3.22	2.65	0.57
Cesar	1.96	2.33	-0.37
Chocó	3.22	3.23	-0.01
Cundinamarca	3.22	6.46	-3.24
Córdoba	3.64	5.68	-2.05
Guainía	0	0.19	-0.19
Guajira	0.84	1.16	-0.32
Guaviare	2.10	1.42	0.68
Huila	10.63	6.01	4.62
Magdalena	2.38	2.84	-0.46
Meta	5.17	5.17	0.01
Nariño	6.43	6.78	-0.35
Norte de Santander	1.54	0.97	0.57
Putumayo	2.52	1.87	0.64
Quindio	0.14	0.65	-0.51
Risaralda	0	1.74	-1.74
Santander	3.78	2.97	0.80
Sucre	1.40	1.16	0.24
Tolima	17.20	15.57	1.63
Valle Del Cauca	7.27	4.84	2.43
Vaupés	0.14	0.13	0.01
Vichada	0.42	0.39	0.03
No Answer	0.14	0.19	-0.05

Table A-10: Differences in region of origin: Consent vs. no consent (within included)

Region	Consent	No Consent	Difference
Amazonas	0	0.57	-0.57
Antioquia	8.99	7.18	1.81
Arauca	2.72	1.72	1
Atlántico	0.54	1.15	-0.6
Bogotá	0.27	0.57	-0.3
Bolívar	3	1.72	1.27
Boyacá	0.82	1.72	-0.91
Caldas	0.82	1.44	-0.62
Caquetá	4.9	6.03	-1.13
Casanare	0.82	0.29	0.53
Cauca	4.09	2.3	1.79
Cesar	2.18	1.72	0.46
Chocó	3	3.45	-0.45
Cundinamarca	2.45	4.02	-1.57
Córdoba	3.27	4.02	-0.75
Guajira	0.82	0.86	-0.04
Guaviare	1.63	2.59	-0.95
Huila	10.35	10.92	-0.57
Magdalena	1.36	3.45	-2.09
Meta	5.99	4.31	1.68
Nariño	5.72	7.18	-1.46
Norte de Santander	1.36	1.72	-0.36
Putumayo	2.45	2.59	-0.13
Quindio	0.27	0	0.27
Santander	4.36	3.16	1.2
Sucre	0.82	2.01	-1.19
Tolima	19.62	14.66	4.96
Valle del Cauca	6.54	8.05	-1.51
Vaupés	0.27	0	0.27
Vichada	0.27	0.57	-0.3
No Answer	0.27	0	0.27

Table A-11: Differences in region of origin: Interviewed vs. not found (within included & given consent)

Region	Surveyed	Not found	Difference
Antioquia	9.85	8.51	1.34
Arauca	3.79	2.13	1.66
Atlántico	0.76	0.43	0.33
Bogotá	0.76	0	0.76
Bolívar	0.76	4.26	-3.5
Boyacá	0.76	0.85	-0.09
Caldas	0.76	0.85	-0.09
Caquetá	3.79	5.53	-1.74
Casanare	0	1.28	-1.28
Cauca	6.82	2.55	4.26
Cesar	0.76	2.98	-2.22
Chocó	0.76	4.26	-3.5
Cundinamarca	4.55	1.28	3.27
Córdoba	3.03	3.4	-0.37
Guajira	0	1.28	-1.28
Guaviare	1.52	1.7	-0.19
Huila	13.64	8.51	5.13
Magdalena	0.76	1.7	-0.94
Meta	5.3	6.38	-1.08
Nariño	6.06	5.53	0.53
Norte de Santander	1.52	1.28	0.24
Putumayo	1.52	2.98	-1.46
Quindio	0.76	0	0.76
Santander	5.3	3.83	1.47
Sucre	0.76	0.85	-0.09
Tolima	21.21	18.72	2.49
Valle del Cauca	3.79	8.09	-4.3
Vaupés	0	0.43	-0.43
Vichada	0	0.43	-0.43
No Answer	0.76	0	0.76

Table A-12: Differences in cause of displacement: RUPD-included vs. not included

Cause of Displacement	RUPD-included	Not-included	Difference
Death threat	76.64	77.93	-1.28
Forced recruitment threat	11.89	7.71	4.18
Disappearance of family member	2.8	0.66	2.13
Armed combat	1.4	1.73	-0.33
Spraying	0	0.13	-0.13
Physical mistreat	0.7	1.33	-0.63
Mines	0	0.13	-0.13
Death of family member	4.2	3.32	0.87
Deny or restrict access to survival goods	0.56	0.66	-0.11
Theft of goods by armed actor	0.56	0.53	0.03
Kidnap of family member	0.42	0.13	0.29
Sexual violence	0.42	0.66	-0.25
N/A	0.42	5.05	-4.63

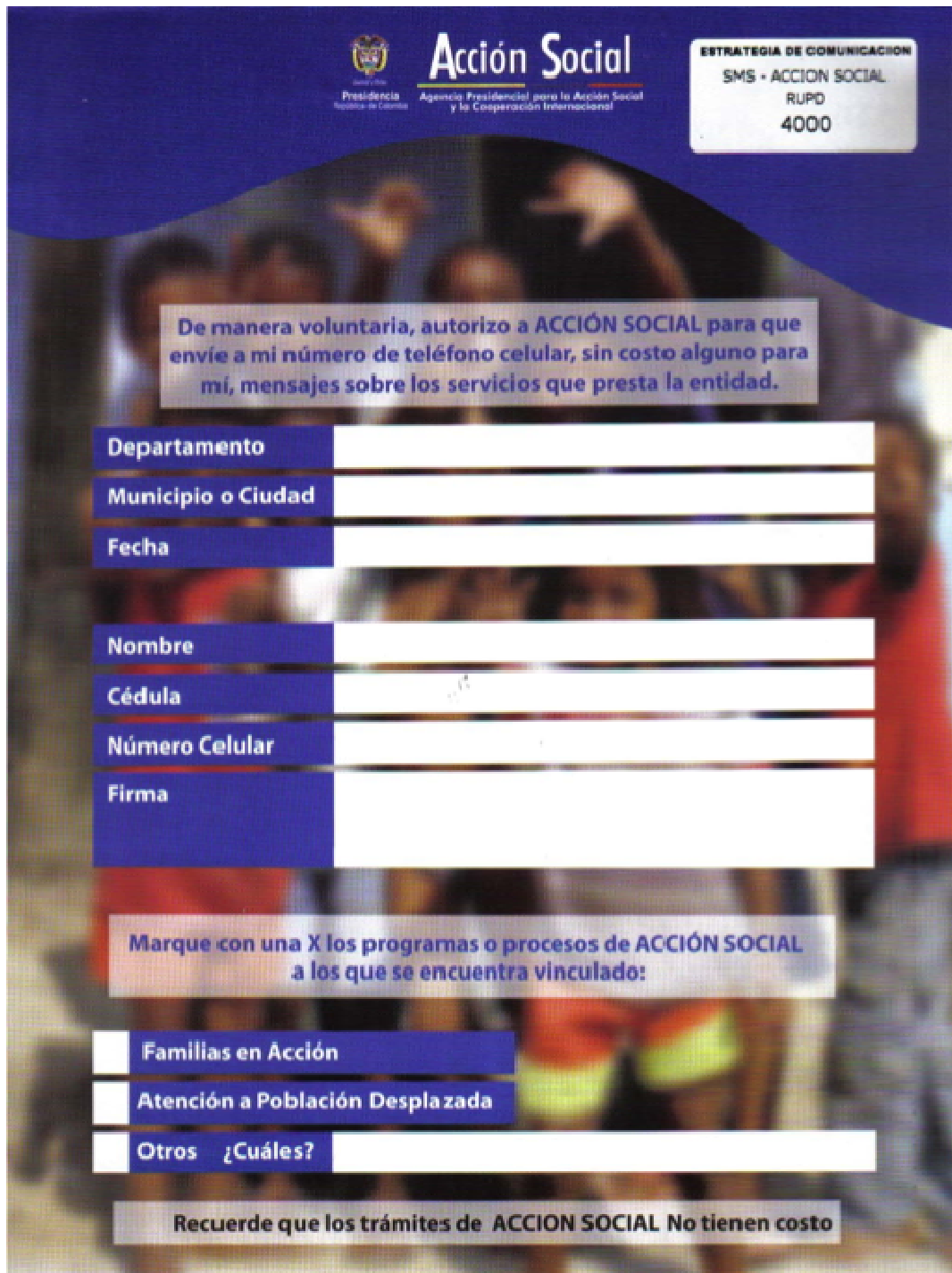
Table A-13: Differences in cause of displacement: Consent vs. no consent (within included)

Cause of displacement	Consent	No consent	Difference
Death threat	77.93	75.29	2.64
Forced recruitment threat	11.17	12.64	-1.47
Disappearance of family member	2.72	2.87	-0.15
Armed combat	1.36	1.44	-0.07
Physical mistreat	0.27	1.15	-0.88
Death of family member	4.36	4.02	0.34
Deny or restrict access to survival goods	0.27	0.86	-0.59
Theft of goods by armed actor	0.27	0.86	-0.59
Kidnap of family member	0.27	0.57	-0.3
Sexual violence	0.82	0	0.82
N/A	0.54	0.29	0.26

Table A-14: Differences in cause of displacement: Interviewed vs. not found (within included & given consent)

Cause of displacement	Interviewed	Not found	Difference
Death threat	81.06	76.17	4.89
Forced recruitment threat	9.09	12.34	-3.25
Disappearance of family member	2.27	2.98	-0.71
Armed combat	1.52	1.28	0.24
Physical mistreat	0	0.43	-0.43
Death of family member	4.55	4.26	0.29
Deny or restrict access to survival goods	0.76	0	0.76
Theft of goods by armed actor	0	0.43	-0.43
Kidnap of family member	0	0.43	-0.43
Sexual violence	0	1.28	-1.28
N/A	0.76	0.43	0.33

Appendix B. Contact Consent Form



The form is titled "Acción Social" and is part of the "ESTRATEGIA DE COMUNICACION" for "SMS - ACCION SOCIAL" with a budget of "RUPD 4000". It includes a consent statement, a registration form with fields for location, name, ID, and phone number, a section for selecting programs, and a reminder that services are free.

Acción Social
Presidencia
Secretaría de Colombia
Agencia Presidencial para la Acción Social
y la Cooperación Internacional

ESTRATEGIA DE COMUNICACION
SMS - ACCION SOCIAL
RUPD
4000

De manera voluntaria, autorizo a ACCIÓN SOCIAL para que envíe a mi número de teléfono celular, sin costo alguno para mí, mensajes sobre los servicios que presta la entidad.

Departamento

Municipio o Ciudad

Fecha

Nombre

Cédula

Número Celular

Firma

Marque con una X los programas o procesos de ACCIÓN SOCIAL a los que se encuentra vinculado:

Familias en Acción

Atención a Población Desplazada

Otros ¿Cuáles?

Recuerde que los trámites de ACCION SOCIAL No tienen costo