

Bridging the Digital Divide: Data Access and Integration of Venezuelan Migrants in Colombia

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Abstract

The humanitarian crisis and violence in Venezuela have forced nearly two million Venezuelans to flee to Colombia. Despite the Colombian government's growing efforts to provide support, forcibly displaced and migrant populations continue to encounter significant legal, economic, and social barriers. One of these barriers is limited internet access, which restricts the amount of information financially constrained migrants can obtain about government programs or economic opportunities. It also hampers their ability to expand or sustain their social ties. In this study, supported by the Innovations for Poverty Action Colombia and in collaboration with the National Planning Department of Colombia, we aim to assess the impact of enhanced data access on migrants' knowledge and interest in existing migrant assistance programs, trust in the government, success in the labor market, and level of self-reported well-being. We do so by providing mobile data credits to a sample of Venezuelan migrants in Colombia who currently have no internet access. Additionally, a subgroup of the sample will receive WhatsApp messages from the Colombian government, providing accurate information about existing social programs and encouraging sign-ups for the online portal that facilitates these programs. We also investigate the role of digital literacy, measured with a novel set of literacy measures, on shaping the intervention effects. Analyzing this intervention's impact can inform policies to strengthen connections between migrant communities and host countries, leveraging widespread WhatsApp use for enhanced public service delivery.

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1 Introduction

More than 6 million Venezuelans fled the country as refugees and migrants, constituting one of the largest external displacement crises in recent history (UNHCR, 2022). While many emigrated due to dire economic situation and in search of work opportunities and stability, others had to flee their homes due to political persecution and violence (Salas-Wright et al., 2022). More than a third emigrated to Colombia, presenting various challenges and opportunities for country’s already fragile social, economic, health systems and infrastructure. In collaboration with local and international organizations, the Colombian government implemented several initiatives and integration programs to assist Venezuelan migrants in adapting to their host community. One of the most notable initiatives is granting the migrants Temporary Protection Status (TPS) for a certain period, which offers Venezuelan migrants access to essential services like health and education, along with a legal pathway to remain and work in the country. As of 2022, 1.6 million of Venezuelans have a temporary protection permit, with 2.5 million Venezuelans having completed a pre-registration for temporary protection status (UNHCR, 2022). Evaluating the effectiveness of the Colombian approach in assisting Venezuelan migrants is beyond the scope of this paper. Instead, we focus on exploring the significance of data access limitations for Venezuelan migrants. Specifically, we examine how this access – or the lack thereof – relates to their engagement with the services provided by the host community, their trust in the government, success in the labor market, and overall well-being.

Migrants encounter a multitude of potential challenges while navigating life within their new community, whether arising from the disruption of their social networks, barriers to entering the labor market, or even discrimination from members of the host society (Safdar et al., 2023). As they navigate numerous uncertainties, having access to accurate information is invaluable. While much of such information is available online, navigating through the plethora of (mis)information about government programs can be daunting, especially for a significant percentage of mobile users in Colombia who have limited

phone plans, offering a restricted amount of data to use. At the same time, even limited phone plans in Colombia usually provide unrestricted access to platforms like WhatsApp and Facebook. This comes with many advantages: they provide users with an opportunity to stay connected to their networks and expand their ties, as well as share valuable logistics information (Chang, 2020). Alongside these advantages, these platforms also come with significant dangers. WhatsApp, in particular, has been identified as a potent tool for spreading rumors, fake news, disinformation, and misinformation (Javed et al., 2020; Elías and Catalan-Matamoros, 2020). For policymakers striving to implement effective social programs, the limited ability of users with restricted data plans to verify the truthfulness of received information and access accurate new information poses an additional barrier.

In this paper, we aim to shed light on the following questions: What is the impact of enhanced mobile data access on forcibly displaced and migrant communities – their levels of knowledge and interest about government programs, trust in the government, success in the labor impact, and reported well-being? To what extent are migrants misinformed or not informed about social programs and opportunities in the host country, and how does this vary depending on their levels of digital literacy? How does data access shape the delivery of public services? Collaborating with the *Innovations for Poverty Action Colombia* and the *National Planning Department of the Government of Colombia*, we are able to reach the community of Venezuelan migrants in Colombia who have registered to Sisbén (Identification System for Potential Beneficiaries of Social Programs), but have not registered on the online portal, Portal Ciudadano. Sisbén collects data on economic and social status to guide social protection programs; Portal Ciudadano is a user-friendly online platform linked to Sisbén, facilitating user engagement and data management. Among the Venezuelan migrants who registered for Sisbén but not for Portal Ciudadano, we focus on a subset of those who have no computer nor internet access. This is an under-researched group whose experiences, especially related to digital inclusion and integration into the

host society, are important to understand better.

To investigate the impact of breaking data access barrier for this population, we are conducting a randomized controlled trial in which we provide subjects with mobile phone credits (equivalent to an unlimited monthly plan). In addition to the primary treatment of the unlimited monthly plan, our design includes two additional arms: one where participants receive a monthly plan along with direct messages about Portal Ciudadano; the other where they receive these messages within moderated WhatsApp groups. These groups serve the dual purpose of providing users with legitimate information but also facilitating connections among migrants, enabling information exchange and feedback. Apart from evaluating the causal impact of improved data access, we also gather quantitative descriptive data through a set of literacy measures to delve into the role of digital literacy within this context.

This study holds the potential to make contributions to the literature concerning the role of communication technology in public service delivery; our understanding of digital literacy outside of the US; and links between labor market success and digital inclusion within migrant communities. Furthermore, it could offer valuable insights for policymaking concerning forcibly displaced communities and the host countries that accommodate them. First, it will allow us to characterize how migrants navigate the online environment and the extent to which they are (mis)informed about social and economic programs, job opportunities, and other aspects of the host country through the survey data we will collect. Secondly, the experimental part of our study will provide causal evidence of the impact that reducing data access constraints can have on the overall success of integration, encompassing various aspects of migrants' lives. Lastly, by combining the provision of mobile data with access to moderated WhatsApp groups, we hope to provide practical insights on how to channel the widespread use of WhatsApp toward improving public service delivery.

2 Migration, Public Service Delivery & Digital Literacy

Violence and the lack of essential services has led several millions of Venezuelans to flee the country, with this humanitarian crisis characterized as “the largest and most underfunded in modern history” (Bahar and Dooley, 2019). Nearly two million Venezuelans have fled to Colombia (USAID 2020), where the government has started a process of regularization of Venezuelan refugees and migrants that includes providing them with a Temporary Protection Status that allows access to basic services including the national health system and the job market (UNHCR-IOM, 2021). However, various barriers persist, made even more challenging by the lack of access to accurate information. The challenges related to data access not only limit the financially constrained migrants’ ability to access vital information about economic and other opportunities but also hinder their ability to verify the credibility of the information they receive.

Our approach draws inspiration and insights from research on the role of communication technology (ICT) in public service delivery, digital literacy, and migrant integration. A growing body of research finds that increased mobile phone access facilitates the use of remittances (Moorena et al., 2020), improves consumption smoothing (Batista and Vicente, 2018) and reduces the number of households in extreme poverty (Suri and Jack, 2016; Lee et al., 2021). Furthermore, mobile phone access has shown promise in enhancing education outcomes (Aker, Ksoll and Lybbert, 2012) and promoting financial inclusion (Lashitew, van Tulder and Liasse, 2019), particularly when accompanied by training in money services or mobile platforms. Mobile phone access also leads to a reduction of search costs in labor markets, which should increase workers’ reservation wage and job arrival rate, while reducing unemployment. Despite its potential, limitations surrounding mobile data prevent users from taking full advantage of the possible benefits of mobile phone access. The impact of such limitations is hard to quantify, particularly because it is challenging to identify which individuals would benefit from phone credit interventions. We are able to overcome this problem through our collaboration with the Innovations for

Poverty Action, allowing us to directly target a population that is facing known data restrictions and could clearly benefit from the specific information (e.g., about essential services and the job market) accessible through mobile services.

This population is also substantively important in that they have little connection to the state in the territory in which they live. Declining state institutional legitimacy is widespread; the reasons for this decline are varied, but there is now interest in understanding the process of cultivating legitimacy. An intriguing intervention involves the provision of information about the functioning of government services. Barnes et al. (2018) demonstrate that providing UK citizens with a “Taxpayer’s Receipt” about the true breakdown of government spending made citizens become more knowledgeable about government spending. Buell, Porter and Norton (2021) expands this theme to include a field experiment in which a municipal government sent photographs of their employees addressing specific complaints by citizens. This intervention increased both citizens’ use of government services and their trust in government. The concern in our context is that many migrants are unaware of existing government programs. By providing them with information and an outlet for other migrants to share their experiences accessing these programs, we expect to find that these migrants are then more supportive of the Colombian government.

Our research design also centers the importance of the concept of digital literacy. Recent work tests how survey measures compare with digital trace measures in differentiating between respondents drawn from high and low-information literacy samples (Guess and Munger, 2023). In doing so, they conclude that digital literacy should be operationalized as consisting of a skills component and an information literacy component. Munger et al. (2024) provides an immediate descriptive antecedent to our project, adapting the Guess and Munger (2023) approach to the contexts of Colombia and Mexico. They demonstrate that, unlike in the US where age is the strongest correlate of digital literacy, in these Latin American countries education is the strongest correlate. Furthermore, they demonstrate

that the ways in which people from these countries get online is distinct from most of the better-studied global north contexts. Their results update Latinobarómetro (2018), which finds that 64% of the population in Latin America used WhatsApp app, slightly higher numbers for Colombia (67%). Treré (2020) explains WhatsApp's appeal in these contexts:

“[I]ts simplicity, reliability and accessibility are some of its core selling points, especially for people in the Global South where online services are accessed mainly through cellphones and several connectivity and bandwidth issues are often thwarting a rapid and fluid digital experience.”

This has important implications for the way that digital literacy is operationalized; we follow their recommendation to focus on the specific affordances of WhatsApp, the most-used social media platform in both Mexico and Colombia. This includes the battery of specific “WhatsApp knowledge” questions that explicitly ask how well respondents understand the affordances of this platform, including the technical limits around re-sharing and image sharing. We hope to expand on this growing research, by moving away from participants that have unconstrained access to computers, are based in the US, and face no data limitations. We expect a large variation in digital literacy within the sample we are working with, especially given that a lot of Venezuelan migrants were members of a professional and highly-educated workforce that experienced a large negative wealth shock due to the collapse of the Venezuelan economy.

Finally, this study also contributes to the growing literature on the economic integration of refugees and labor market matching (Åslund, Hensvik and Skans, 2014; Abebe et al., 2021; Bazzi et al., 2021; Battisti, Giesing and Laurentsyevea, 2019). Individuals with lower access to online spaces face higher search costs, as they are much less likely to be exposed to job postings or job-related information which is increasingly advertised online or spread through online networks. This results in various inefficiencies, from poorer matching of employers' needs with employees skills to delays in the time it takes for a job-seeker to find suitable opportunities. These problems are exacerbated in communities like the one

at the center of our research, where individuals need to navigate the employment search in a new host-country labor market together with all the uncertainties and complexities of migration. Increased data access may thus facilitate a more efficient worker-job matching process. Our study aims to evaluate a comprehensive set of outcomes, among which, we will closely examine the participants' success in the job market. Additionally, we will assess any other career training or opportunities that they might have been able to capitalize on as a result of our intervention. Through our study, we hope to provide evidence of a short-term policy intervention that significantly enhances the information ecosystem of the forcibly displaced and migrant community, facilitating a set of positive socio-economic outcomes.

3 Hypotheses

We will test the following hypotheses:

H1: Participants who receive unlimited mobile credit (treated subjects) will report higher level of knowledge about the existing assistance programs.

- **H1a:** The positive treatment effect will be most pronounced for participants who receive unlimited mobile credit and participate in moderated WhatsApp groups (treatment arm 3).

H2: Participants who receive unlimited mobile credit (treated subjects) will report improved job market outcomes.

H3: Participants who receive unlimited mobile credit (treated subjects) will report stronger trust in the host government.

- **H3a:** The positive treatment effect will be most pronounced for participants who receive unlimited mobile credit and receive direct message (treatment arm 2).

H4: Participants who receive unlimited mobile credit (treated subjects) will report improved subjective well-being.

The reasoning behind H1a is that participants might learn more about the existing assistance programs from the comments and questions of others within WhatsApp groups (treatment arm 1). In this case, this would strengthen the positive effect of the treatment. The reasoning behind H3a is that participants might update about government capacity and feel stronger connections as a consequence of a more personalized approach involving receiving direct messages (treatment arm 2). We will also test whether the ability to detect misinformation moderates the effects. We anticipate that individuals who demonstrate a higher ability to detect misinformation will also exhibit a greater treatment effect on their knowledge about the existing assistance programs and more positive job market outcomes. We do not hold any specific expectations regarding how it might moderate subjective well-being, and we present that analysis as exploratory.

4 Research Design

To assess whether limited data access is a binding constraint facing forcibly displaced and migrant populations in their information seeking and verification process, we plan to conduct a randomized controlled trial in which we provide subjects with enhanced access to internet and information about the existing assistance programs. This evaluation is being conducted together with the Departamento Nacional de Planeación (DNP), the Colombian government agency that coordinates, articulates, and supports the planning of short, medium, and long-term public policies in the country. The National Planning Department is also the government organization in charge of administering Sisbén, and particularly, its online portal Portal Ciudadano.

Sisbén, which stands for *Sistema de Selección de Beneficiarios Para Programas Sociales*, is a system for selecting beneficiaries for social programs in Colombia. Any individual with

valid identification and residing in private households can register in the Sisbén database. Registration involves responding to a survey and providing a set of socio-economic information about oneself. This database, certified by the National Planning Department (DNP), then serves as a reference for government entities to determine who is eligible to access social programs and allocate benefits accordingly. Sisbén's accompanying online portal, the "Citizen Portal" (Portal Ciudadano), was created to enhance users' understanding of Sisbén and their engagement with various programs they can benefit from. Within this user-friendly interface, registered users can access the information they provided in the Sisbén database, make different requests, or learn about Sisbén and its operations. Registering for the Portal Ciudadano is not a mandatory component of the Sisbén registration process. However, the National Planning Department is interested in ensuring that citizens update their Portal Ciudadano frequently (to facilitate better national planning and public service delivery) and that users are aware of the benefits of engaging with this online platform, and consequently Sisbén-related information and services.

The criteria for selection of participants in our sample is as follows: individuals who are above 18 years old, who have no access to internet or computer, who are the head of their households, and finally, who are registered in Sisbén, yet not registered for Portal Ciudadano. All participants in the sample have Temporary Protection Permit, i.e. temporary protection, legal status, access to essential services and rights for a specified period. The National Planning Department of the Government of Colombia provided our team with access to this population, with participant communication going through the Innovations for Poverty Action. Importantly, the dataset shared with us does not include names of individuals nor any sensitive information, and participants agreed (when signing up for the portal) that they may be contacted. The dataset – which we are using for randomizing participants – only has information on users' age, sex, education level and municipality coded. Every aspect of this study will take place online. Innovations for Poverty Action Colombia experienced team will handle sending of the mobile credit to our participants,

as well as the process of sending surveys via WhatsApp.

4.1 Treatment

Treatment consists of enhanced data access, which we operationalize by providing users who did not have unlimited access to data with unlimited monthly data plan (i.e. mobile credit which can be easily transferred online to whatever phone number of choice). Access to mobile credit is relatively inexpensive compared to other economic assistance programs. IPA will provide mobile phone credits of around 10 GB for a month to the participants from Treatment 1, 2 and 3. The control group will receive the one-time mobile phone recharge up to one week after completing the endline survey.

In addition to the enhanced data access, two other treatment arms (“data+direct messages”; and “data+messages in WhatsApp groups”) will receive government information about Portal Ciudadano on behalf of the National Planning Department /Innovations for Poverty Action Colombia. Accessing Portal Ciudadano allows citizens to – among other activities – virtually request a Sisbén survey, update information, or include other household members. Being part of Sisbén allows the government to identify the population of interest for various social and economic integration programs, and make plans or target groups accordingly. For this reason, it is very important yet hard to achieve that people keep their information up to date in the Sisbén dataset.

Within the third treatment arm, participants will receive this information within WhatsApp groups with several other participants. Although WhatsApp can be used for one-to-one messaging, participation in large group conversations with previously unknown people, like the one in this treatment condition, is not uncommon in Colombia. Munger et al. (2024) shows that the median Colombian is involved in 6 of these groups, which range from groups of co-workers, friends, family and unknown participants. This list summarizes the treatment conditions:

- **Treatment Group A [N=525]:** Receives phone credit, equivalent to an unlimited

monthly plan.

- **Treatment Group B [“data+direct messages”; N=525]:** Receives phone credit and direct messages from our partners (Innovations for Poverty Action Colombia) on behalf of the Colombian government.
- **Treatment Group C [“data+messages in WhatsApp groups”; N=540]:** Receives phone credit and messages from our partners (Innovations for Poverty Action Colombia) on behalf of the Colombian government within a WhatsApp group with several other participants. Whatsapp messages will be sent using Twilio, on each Monday of the four weeks of the intervention. For this intervention, 18 groups of approximately 30 participants each will be created.
 - A member of the Innovations for Poverty Action Colombia team will be included in the WhatsApp group. This group is envisioned as providing participants with space to communicate and connect with one another if so they choose. The role of this moderator would be to observe interactions and, in case that the conversations become uncivil for any reason, block the participant (exclude them from this group) or remind them of the rules of interactions within the group (which we would outline). If they raise questions, this moderator would remind participants to send a direct e-mail to our research e-mail address or remind them of the National Planning Department website where they can check out the Q&A or contact relevant personnel.
 - Introductory message: *“Hello! I am a member of the research team, and I will be at your disposal for any questions you may have about the information shared in this group. I may not have all the answers immediately, but I will do my best to find the information you need. I will make sure to attend to your question within 24 hours at most. The other members in this group may also have useful experiences to share, so we encourage you to connect here and share your experiences or*

thoughts. Please note that no discriminatory, hateful, or toxic speech is permitted. Rest assured that your privacy will be protected – at no point will your name or phone number be shared in connection with any of the messages.”

- Daily message: *“Please be reminded that I am at your disposal for any questions you may have about the programs described in our earlier message. You are also welcome to share here your experiences with this or similar programs with members of this group – we would love to hear from you!”*

1. **Message 1:** “Hi [name], did you know that Sisbén has a virtual service channel? Discover the Citizen Portal, sign up, and request your survey. If you already have your survey, you can check your information. Please note that being registered on the portal is not the same as being registered in the Sisbén database. Make sure to have your survey conducted at your residence and get your Sisbén classification. Visit <https://portalciudadano.sisben.gov.co/>”
2. **Message 2:** “Hi [name]. We are Innovations for Poverty Action Colombia. Now you can access your Sisbén information through the Citizen Portal. Register on the virtual Sisbén service channel and quickly download your household’s record. Visit <https://portalciudadano.sisben.gov.co/>”
3. **Message 3:** “Hi [name], If you already have your Sisbén classification, use the Citizen Portal to access the information recorded in your survey. If your information has changed, you can request a free and quick update. Visit <https://portalciudadano.sisben.gov.co/>”
4. **Message 4:** “Hi [name]. We are Innovations for Poverty Action Colombia. Is someone in your household missing the Sisbén survey? Don’t worry! If a new member has joined your household or someone has just received their PPT (Priority Targeting Program), you don’t need to request a new survey.

Include them through the Citizen Portal Sisbén, completely free. Register at <https://portalciudadano.sisben.gov.co/>”

5. **Message 5:** “Hi [name]. We are Innovations for Poverty Action Colombia. Did you know that the Sisbén survey makes you eligible for potential social program benefits? Request this survey through the Citizen Portal Sisbén at <https://portalciudadano.sisben.gov.co/>. If you already have your Sisbén survey, you can use the Citizen Portal to check your survey information and update it if necessary.”
6. **Message 6:** “Hi [name]. We are Innovations for Poverty Action Colombia. If you have children under 6 years old, siblings, parents, or other household members who were not registered in your Sisbén survey, you can easily and quickly include them through the Citizen Portal Sisbén. Register at <https://portalciudadano.sisben.gov.co/>”
7. **Message 7:** “Hi [name], Take advantage of the benefits of the Citizen Portal Sisbén, a website where you can carry out various Sisbén-related procedures quickly, for free, and without the need to visit any office. All you have to do is register on the portal, and you’re good to go. Remember that Venezuelans can also use the Citizen Portal Sisbén. Register by clicking here: <https://portalciudadano.sisben.gov.co/>”

Item	Whatsapp groups 1-6	Whatsapp groups 7-12	Whatsapp groups 13-18
M1	September 11, 2pm	September 12, 2pm	September 13, 2pm
M2	September 11, 3pm	September 12, 3pm	September 13, 3pm
M3	September 11, 4pm	September 12, 4pm	September 13, 4pm
M4	September 18, 2pm	September 19, 2pm	September 19, 2pm
M5	September 18, 3pm	September 19, 3pm	September 19, 3pm
M6	September 18, 4pm	September 19, 4pm	September 19, 4pm
M7	September 25, 2pm	September 26, 2pm	September 26, 2pm
M8	September 25, 3pm	September 26, 3pm	September 26, 3pm
M9	September 25, 4pm	September 26, 4pm	September 26, 4pm
M10	October 2, 2pm	October 3, 2pm	October 4, 2pm
M11	October 2, 3pm	October 3, 3pm	October 4, 3pm
M12	October 2, 4pm	October 3, 4pm	October 4, 4pm

Figure 1: Schedule of sending messages within WhatsApp groups

- **Control Group; N=560:** Continue their activities as usual during the research period; after the final survey, they will also receive mobile credit so that all participants benefit equally from the research.

Following the treatment, we will ask participants to respond to a survey with questions assessing participants' levels of knowledge and interest regarding social programs, trust in the government, and their subjective well-being. We will also collect behavioral data (measured through a set of novel online tasks) that quantifies users' ability to detect fake news and overall levels of digital literacy.

4.2 Randomization

Given the pre-treatment information available from Sisbén, we conduct a block randomization by age, gender, education level, and city. In the Sisbén sample shared with us, there are 67,439 individuals from five municipalities, all of whom have temporary stay permits. Of the total sample, 64.22% are female, while 35.78% are male. The mean age is 36.82, with a median age of 34.35. Furthermore, 25.68% of the sample has an elementary school education level or no formal schooling, 61.18% has a high school education, and 13.14%

holds a university degree or higher. IPA validated a subset of 33,500 observations from this database, and confirmed 23,459 (70%) numbers that are currently active. IPA and the PIs will select around 2,000 individuals to participate in the study.

Activity	Aug											September																	October																
	17	18	21	22	23	24	25	28	29	30	31	1	4	5	6	7	8	11	12	13	14	15	18	19	20	21	22	25	26	27	28	29	2	3	4	5	6	9	10	11	12	13	14		
Activity	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri	Sat		
Screening survey																																													
Selection of participants																																													
Baseline survey																																													
Information via Whatsapp messages																		M1 M2 M3					M4 M5 M6					M7 M8 M9					M10 M11 M12												
Information via Whatsapp groups																		M1 M2 M3	M1 M2 M3	M1 M2 M3			M4 M5 M6	M4 M5 M6	M4 M5 M6		M7 M8 M9	M7 M8 M9	M7 M8 M9		M10 M11 M12	M10 M11 M12	M10 M11 M12												
Claro recharges																		20 GB														10 GB													
Tigo recharges																		7.5 GB																3 GB											
Movistar recharges																		5 GB					5 GB					5 GB						5 GB											
WOM recharges																		2.5 GB					2.5 GB					2.5 GB						2.5 GB											
Exito recharges																		3.5 GB								3.5 GB								3.5 GB											
ETB recharges																		5.5 GB											5.5 GB																
Endline survey																		6 GB												6 GB															

Figure 2: Timeline

4.3 Outcomes

Included in the surveys are the following outcomes: knowledge of government programs; interest in government programs; trust in the host government; ability to retrieve info or detect misinformation; success in the job market; well-being; and the outcomes characterizing participant usage of data access for exploratory analysis.

Survey Instruments

Screening Questions

Variable name	Question [ENG]
welcome	Hello! We are Innovations for Poverty Action Colombia, Colombia. Sisbén shared your contact information with us to invite you to participate in a survey for an Innovations for Poverty Action Colombia, study. If you end up taking part in this study, you will receive an internet top-up to your cell phone and you will be entered in a raffle for a market voucher worth 200,000 COP. In addition, we will contact the winners in two weeks and announce the results to all participants. In order to participate and answer these questions correctly, please read the instructions carefully and answer with the number associated with your answer for the single-choice questions.
verif_1	Are you [name]? Answer: - 1: if YES, it is you - 0: if NO
verif_reminder	It's been a while, we want to know if we are communicating with [name].
verif_2	Do you know [name]? What is the relationship between the owner of this cell phone and [name]?
verif_3	Is this the best phone number to contact [name]?
verif_dob_1	To validate that we are communicating with you, [name], please enter your year of birth. Sisbén provided us with this information, so we will validate your identity with your year and month of birth. Please enter below only the year in which you were born, in numbers, without periods (.) or commas (,). For example: 1990.

Baseline Survey

Variable name	Question [ENG]
welcome	<p>Hello again [name]! We are Innovations for Poverty Action Colombia, Colombia. Considering that you agreed to participate in the study of access to information on social programs for Venezuelans in Colombia, we will ask you a few questions that will take you no more than XX minutes to answer, if you agree to continue participating in the study.</p> <p>You will receive an internet top-up to your cell phone, and you will be entered in a raffle for a market voucher worth 200,000 COP. In addition, we will contact the winners in two weeks and announce the results to all participants.</p>
verif_1	Are you [name]? Answer:
verif_2	Do you know [name]? What is the relationship between the owner of this cell phone and [name]?
verif_3	Is this the best phone number to contact [name]?
verif_4	Could you please give this cell phone to [name] to answer a few brief questions to participate in a survey? ([name] can continue to answer at any time today).
verif_dob_1	To validate that we are communicating with you, [name], please enter your year of birth. Sisbén provided us with this information, so we will validate your identity with your year and month of birth. Please enter below only the year in which you were born, in numbers, without periods (.) or commas (,). For example: 1990
verif_6	What is the telephone number to contact [name]?
education_st	What is the highest level of education you completed?
marital_st	What is your current marital status?
employment_st	In which activity did you spend the most time last week?
state_ven	In which state of Venezuela did you reside before moving to Colombia? (if you have lived in more than one, please answer with the one you lived in the longest)
place_entry	What was the first place of residence in Colombia to which you arrived when you immigrated from Venezuela?
place_entry_o	Can you please specify the first place of residence in Colombia to which you arrived when you immigrated from Venezuela? Answer only with the name of the city or municipality in Colombia.
time_fb	On average, how much time do you spend on Facebook during a typical week?
time_ig	On average, how much time do you spend on Instagram during a typical week?
time_wa	On average, how much time do you spend on WhatsApp during a typical week?
time_ff	On average, how much time do you spend on Family and friends (offline) during a typical week?
time_nt	On average, how much time do you spend on Non-tech activities during a typical week?
1_internet_use	How much do you use the internet to stay in touch with friends and family?

Variable name	Question [ENG]
2_internet_use	How much do you use the internet to read the news?
3_internet_use	How much do you use the internet for entertainment?
4_internet_use	How much do you use the internet to look for paid jobs?
5_internet_use	How much do you use the internet to look for government or other assistance programs?
education_st	What is the highest level of education you completed?
marital_st	What is your current marital status?
employment_st	In which activity did you spend the most time last week? Answers: working; job searching; studying; own household chores/caregiver in the household; permanently unable to work; pensioned/retired; other activity; no answer (omit)
state_ven	In which state of Venezuela did you reside before moving to Colombia? (if you have lived in more than one, please answer with the one you lived in the longest)
place_entry	What was the first place of residence in Colombia to which you arrived when you immigrated from Venezuela?

Endline Survey

Variable name	Question [ENG]
welcome	Hello again [name]! We are Innovations for Poverty Action Colombia. Considering that you agreed to participate in the study of access to information on social programs for Venezuelans in Colombia, we will ask you a few questions that will take you no more than 20 minutes to answer, if you agree to continue participating in the study. You will receive an internet top-up to your cell phone and you will be entered in a raffle for a market voucher worth 200,000 COP. In addition, we will contact the winners in two weeks and announce the results to all participants.
verif_1	Are you [name]?
Consent	<p>[name], we would like to invite you to continue participating in the next stages of the study whose objective is to improve access to information on social programs for Venezuelans in Colombia. The next stages of the study include XX and YY [Here should go what these stages of the study are in terms of messages and surveys that will be sent to the participant]. We will send you these surveys and messages within the next month. By participating, you will be eligible for other bonus raffles. By taking part in this survey you will participate in the raffle of a market bonus, worth 200,000 Colombian pesos. We will contact the winners in two weeks and announce to all participants the results.</p> <p>You may stop answering at any time, or skip any question you do not wish to answer by typing 77, or omit, and you will not be affected. All of your information will be encrypted to be protected. For more information about this informed consent, please click on this link: [Baseline consent link]</p>
1_program	<p>What is Sisbén?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 if a health insurance - 2 if a socioeconomic assistance agency - 3 if it is a socio-economic characterization survey - 4 don't know - 5 no answer (omit)
2_program	<p>Portal ciudadano provides information about the Sisbén, do you know which procedures you can perform in the Portal ciudadano?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 if requesting and following up on the Sisbén survey - 2 if Requesting prioritization for subsidies - 3 if Affiliation to the health system - 4 if All of the above - 5 if None of the above - 99 Don't know - 77 No answer (omit)
3_program	<p>How much is the minimum wage in Colombia (without transportation subsidy) for 2023?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 1,300,000 COP per month - 2 1,000,000 COP per month - 3 960,000 COP per month - 4 1,160,000 COP per month - 99 Don't know - 77 No answer (omit)

Variable name	Question [ENG]
1_interest	<p>How much interest do you have in migrant assistance programs provided by the Colombian government?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 if Very strong interest - 2 if Strong interest - 3 if Moderate interest - 4 if Low interest - 5 if No interest - 99 Don't know - 77 No answer (omit)
1_interest _{spec}	Can you please specify why you have little or no interest in the Colombian government's migrant assistance programs?
2_interest	<p>How much interest do you have in migrant assistance programs provided by international NGOs?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 if Very strong interest - 2 if Strong interest - 3 if Moderate interest - 4 if Low interest - 5 if No interest - 99 Don't know - 77 No answer (omit)
2_interest_spec	Can you please specify why you have little or no interest in the international NGOs' migrant assistance programs?
1_trust	<p>How much do you trust the Colombian government to do what is right for Venezuelan migrants?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 if Very strong trust - 2 if Strong trust - 3 if Moderate interest - 4 if Low trust - 5 if No trust - 99 Don't know - 77 No answer (omit)
1_trust_spec	Can you please specify why you have little or no interest in the Colombian government's migrant assistance programs?
2_trust	<p>How much do you trust international organizations to do what is right for Venezuelan migrants?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 if Very strong trust - 2 if Strong trust - 3 if Moderate interest - 4 if Low trust - 5 if No trust - 99 Don't know - 77 No answer (omit)

Variable name	Question [ENG]
2_trust_spec	Can you please specify why you have little or no interest in the international NGOs' migrant assistance programs?
1_retrieve	Who is the Prime Minister of Japan?
2_retrieve	What is the tallest mountain in North America?
3_retrieve	What car brand had the most sales in the world last year?
1_link	Send us the webpage of the Colombian Ministry of Health.
2_link	Send us the official webpage of the Sisbén.
3_link	Send us the official webpage of the FC Barcelona.
rumor_vc	True or false. Sisbén will guarantee you access to all the government aids and social programs.
employment_st	<p>In which activity did you spend the most time last week?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 Working - 2 Job searching - 3 Studying - 4 Own household chores/caregiver in the household - 5 Permanently unable to work - 6 Pensioned/retired - 66 Other activity - 77 No answer (omit)
1_find_job	During the past 4 weeks have you tried in any way to find a paid job?
2_find_job	<p>How successful were these attempts?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 if I did not find a job - 2 if I did not find a job yet, but found some potential opportunities - 3 if I am in the process of interviewing - 4 if I found a job - 77 No answer (omit)
1_r_training	Compared to previous months, have you tried to receive any additional training or education during the last month?
2_r_training	Can you please give examples or specify additional training or education you have received (or have attempted to receive) during the last month.
3_r_training	Is there a specific reason why you do not want, or are not seeking, additional training or education?
1_a_programs	Have you tried seeking government assistance programs for the past 4 weeks?
1_wellb	<p>Over the past 30 days, how often have you felt: satisfied, joyful, fulfilled, or happy?</p> <p>Answer:</p> <ul style="list-style-type: none"> - 1 if Much more than before - 2 if More than before - 3 if Same as before - 4 if Less than before - 5 if Much less than before - 99 Don't know - 77 No answer (omit)

Variable name	Question [ENG]
2_wellb	Over the past 30 days, how often have you felt: frustrated, nervous, bored, or lonely? Answer: <ul style="list-style-type: none"> - 1 if Much more than before - 2 if More than before - 3 if Same as before - 4 if Less than before - 5 if Much less than before - 99 Don't know - 77 No answer (omit)
3_wellb	Over the past 30 days, how optimistic have you been feeling about the future? Answers: <ul style="list-style-type: none"> - 1 if Much more than before - 2 if More than before - 3 if Same as before - 4 if Less than before - 5 if Much less than before - 99 Don't know - 77 No answer (omit)
meta_stereo	How do you think Colombian citizens perceive Venezuelan migrants? Answer: <ul style="list-style-type: none"> - 1 if Very positively - 2 if Positively - 3 if Neither positively nor negatively - 4 if Negatively - 5 if Very negatively - 99 Don't know - 77 No answer (omit)
1_polariz_scale	How do you feel about Venezuelans in Colombia? Please answer only with a number between a scale of 1 - 100 (with 0 being negative/cold and 100 positive/warm).
2_polariz_scale	How do you feel about Colombians in Colombia? Please answer only with a number between a scale of 1 - 100 (with 0 being negative/cold and 100 positive/warm).
app_internet	Over the last 4 weeks, what websites/apps do you visit online most frequently? Please respond, in a single brief message, with the names of the websites or apps you visit the most.
time_fb	On average, how much time do you spend on Facebook over the last 4 weeks?
time_ig	On average, how much time do you spend on Instagram over the last 4 weeks?
time_wa	On average, how much time do you spend on WhatsApp over the last 4 weeks?
time_ff	On average, how much time do you spend on Family and friends (offline) over the last 4 weeks?
time_nt	On average, how much time do you spend on Non-tech activities over the last 4 weeks?
1_internet_use	How much do you use the internet to stay in touch with friends and family over the last 4 weeks?
2_internet_use	How much do you use the internet to read the news over the last 4 weeks?
3_internet_use	How much do you use the internet for entertainment over the last 4 weeks?
4_internet_use	How much do you use the internet to look for paid jobs over the last 4 weeks?
5_internet_use	How much do you use the internet to look for government or other assistance programs over the last 4 weeks?

4.4 Power Analysis

We rely on studies using similar treatments to the one of our interest (Aker, Ksoll and Lybbert, 2012). The analysis we have conducted suggests that we need a sample of 1,396 participants to detect an effect size of 0.15 standard deviations from standardized outcomes with 80% power. This calculation is based on the primary treatment of enhanced phone data access on knowledge and learning about social programs outcomes. For our study, we hope to have a sample of more or less 2,200 participants, which represents a sample similar to other studies on access to information (for example, Beber (2023)), and larger than other studies on internet access and information (Aggarwal, Brailovskaya and Robinson, 2020; Beber and Scacco, 2022).

5 Analysis

This field experiment deploys a relatively understudied type of treatment. For reasons of statistical power, our design and analysis plan aims to trade off the establishment of our central treatment effect of interest with enriching details about mechanisms and moderators. For this reason, our primary test will pool the three treatment conditions and compare them with the control group.

There are many other outcomes of interest, and given the relative ease of collecting these additional measurements compared to conducting the intervention itself, we will perform additional tests. Notably, these include downstream of our knowledge measure: well-being and employment. These are the outcomes which the assistance program itself aims to improve; however, these are complex real-world outcomes which are difficult to manipulate. We anticipate that we will see positive improvements on both of these outcomes, though their magnitude is likely to be small. We will test whether subjects for whom the treatment switched their knowledge status from 0 to 1 will also show an effect of the treatment on these downstream outcomes. In particular, we expect that those who have become more knowledgeable about the government programs will also report higher well-being and more success in the job market (NB: our measure of job market success also includes training and education opportunities users engaged in).

The unit of randomization is the individual. We plan to implement a matched block randomization to minimize differences between units in each of the treatment conditions along a number of dimensions. We plan to use block randomization based on predetermined available covariate: each participant will be assigned to a block of size 8 and then split into blocks of size 4. The unit of observation for the analysis is also the individual.

We plan to estimate the effects with OLS regressions in which the treatment indicator variables represent assignment to the *Data access* (data versus control), *Information* (messages vs. only data) within Data access assignment, and *Discussion* (messages within WhatsApp groups vs. only messages), within the Information assignment. We mostly rely on our random sampling and treatment assignment to control for potential cofounders and plan to estimate the following specification:

$$Y_i = \alpha_b + \beta_1 Treatment_i + \epsilon_i$$

where outcome Y_i represents the outcome for participant i and is regressed on randomization block fixed effects α_b , and the *Treatment* variables that represents Data assignment (vs. control), Information assignment (vs. data without messages), and Discussion assignment (vs. messages without WhatsApp groups).

The crucial moderator, for our test, will be the subjects' digital literacy, operationalized in a variety of ways. This construct is still being honed in the context of the US and Europe, with significantly less work done in the Global South. While our theory predicts an important role for digital literacy, then, there is still no scholarly consensus on how best to measure it. Given the relative costs of operationalizing this construct through multiple survey batteries, we will perform our test of statistical moderation using each of them separately.

6 Ethics

Our research team has worked on randomized controlled trials around vulnerable populations or sensitive topics, from working with participants in post-conflict countries during the emotionally charged periods of conflict commemorations (Asimovic) to working with rebel groups (Vásquez-Cortés). We have also studied the questions surrounding the concept of digital literacy on a sample of participants with high and low-literacy levels (Munger), which will be a useful experience in designing survey instruments. Our design aims to minimize downsides of expanded internet access among vulnerable populations. Our target population already uses WhatsApp, a major vector for misinformation; given the semi-private and encrypted nature of the platform, it is difficult for governments or other actors to prevent this spread. Our design explicitly directs users to high-quality government websites and demonstrates their usefulness, which we expect to cultivate better internet habits in the future.

The arm of our design which provides only phone credits could plausibly be used for

malign purposes, but we would argue that this is true of any cash transfer program to analogous populations. We are in general hesitant to withhold resources to vulnerable populations out of fear that they use them in ways that we do not like. The partner organization we are working with, Innovations for Poverty Action Colombia, has made enormous progress in the location and implementation of projects with Venezuelan migrants in the last three years and its capacity allows us to have confidence in the contact with the migrant population and the implementation of the project in the proposed places. Also, the National Planning Department has been successful in increasing the number of Venezuelan migrants registered in Sisbén, both through digital and in person campaigns. Given their experience in the region, we have been communicating with them all our design choices to ensure that any ethical or safety-related risks are minimized.

References

- Abebe, Girum, A Stefano Caria, Marcel Fafchamps, Paolo Falco, Simon Franklin and Simon Quinn. 2021. "Anonymity or distance? Job search and labour market exclusion in a growing African city." *The Review of Economic Studies* 88(3):1279–1310.
- Aggarwal, Shilpa, Valentina Brailovskaya and Jonathan Robinson. 2020. Cashing in (and out): Experimental evidence on the effects of mobile money in Malawi. In *AEA papers and proceedings*. Vol. 110 American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203 pp. 599–604.
- Aker, Jenny C, Christopher Ksoll and Travis J Lybbert. 2012. "Can mobile phones improve learning? Evidence from a field experiment in Niger." *American Economic Journal: Applied Economics* 4(4):94–120.
- Åslund, Olof, Lena Hensvik and Oskar Nordström Skans. 2014. "Seeking similarity: How immigrants and natives manage in the labor market." *Journal of Labor Economics* 32(3):405–441.
- Bahar, Dany and Meagan Dooley. 2019. "Venezuela refugee crisis to become the largest and most underfunded in modern history."
- Barnes, Lucy, Avi Feller, Jake Haselswerdt and Ethan Porter. 2018. "Information, knowledge, and attitudes: An evaluation of the taxpayer receipt." *The Journal of Politics* 80(2):701–706.
- Batista, Catia and Pedro C Vicente. 2018. "Is mobile money changing rural Africa?"
- Battisti, Michele, Yvonne Giesing and Nadzeya Laurentsyevea. 2019. "Can job search assistance improve the labour market integration of refugees? Evidence from a field experiment." *Labour Economics* 61:101745.
- Bazzi, Samuel, Lisa Cameron, Simone G Schaner and Firman Witoelar. 2021. Information, intermediaries, and international migration. Technical report National Bureau of Economic Research.
- Beber, Bernd and Alexandra Scacco. 2022. "The myth of the misinformed migrant? Survey insights from Nigeria's irregular migration epicenter." *Working Paper* (957).
- Beber, Bernd, Alexandra Scacco Macartan Humphreys Pheliciah Mwacho Dean Yang. 2023. "Misinformation and Irregular Migration: Evidence from a Field Experiment in Nigeria." *Working Paper* .
- Buell, Ryan W, Ethan Porter and Michael I Norton. 2021. "Surfacing the submerged state: Operational transparency increases trust in and engagement with government." *Manufacturing & Service Operations Management* 23(4):781–802.
- Chang, Adam. 2020. "Networks in a World Unknown: Public WhatsApp Groups in the Venezuelan Refugee Crisis." *arXiv preprint arXiv:2005.05883* .

- Elías, Carlos and Daniel Catalan-Matamoros. 2020. "Coronavirus in Spain: Fear of 'official'fake news boosts WhatsApp and alternative sources." *Media and Communication* 8(2):462–466.
- Guess, Andrew M and Kevin Munger. 2023. "Digital literacy and online political behavior." *Political science research and methods* 11(1):110–128.
- Javed, R Tallal, Mirza Elaaf Shuja, Muhammad Usama, Junaid Qadir, Waleed Iqbal, Gareth Tyson, Ignacio Castro and Kiran Garimella. 2020. A first look at COVID-19 messages on WhatsApp in Pakistan. In *2020 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*. IEEE pp. 118–125.
- Lashitew, Addisu A, Rob van Tulder and Yann Liasse. 2019. "Mobile phones for financial inclusion: What explains the diffusion of mobile money innovations?" *Research Policy* 48(5):1201–1215.
- Lee, Jean N, Jonathan Morduch, Saravana Ravindran, Abu Shonchoy and Hassan Zaman. 2021. "Poverty and migration in the digital age: Experimental evidence on mobile banking in Bangladesh." *American Economic Journal: Applied Economics* 13(1):38–71.
- Moorena, Lolita, Mikaela Rabb, Aliyyah Rusdinar, Simone Schaner, Caroline Tangoren and Natalie Theys. 2020. "Towards inclusive digital finance in indonesia." *Inclusive Financial Innovation Initiative (IFII) White Paper, Abdul Latif Jameel Poverty Action Lab, Cambridge, MA* .
- Munger, Kevin, Angel Villegas-Cruz, Jorge Gallego and Mateo Vásquez-Cortés. 2024. "Reenviado Muchas Veces": How Platform Warnings Affect WhatsApp Users in Mexico and Colombia. Technical report Working paper.
- Safdar, Saba, Hajar Soltan, Marina Begoña Martínez-González and Jorge Enrique Palacio Sañudo. 2023. "Adaptation of Venezuelan refugees in Colombia: The mediating roles of acculturation orientations in influencing acculturation adaptations." *International Journal of Psychology* .
- Salas-Wright, Christopher P, Mildred M Maldonado-Molina, Augusto Pérez-Gómez, Juliana Mejía Trujillo and Seth J Schwartz. 2022. "The Venezuelan diaspora: Migration-related experiences and mental health." *Current Opinion in Psychology* p. 101430.
- Suri, Tavneet and William Jack. 2016. "The long-run poverty and gender impacts of mobile money." *Science* 354(6317):1288–1292.
- Treré, Emiliano. 2020. "The banality of WhatsApp: On the everyday politics of backstage activism in Mexico and Spain." *First Monday* 25.