

The Lasting Legacies of Social Exclusion on Solidarity: Evidence From a from Leper Colony in Colombia

Diego Ramos-Toro

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1 Introduction

Group identity has been identified by economists as a key driver of behavior and social preferences (Goette et. al., 2006; Chen and Li, 2009). Segregation or social exclusion can thus be expected to yield differences in altruism, cooperation and envy, considering the identities that may follow from said social discrimination. An issue that has been less explored is whether there is historical persistence of such social preferences coming from exclusion. Are historical experiences of social exclusion conducive to differences in pro-sociality and social capital in the present?

Exploiting the geographical location of a policy that officialized and reinforced the long-lasting social and medical stigma against lepers, this paper investigates the persistent consequences of historical social exclusion on altruism and social capital. Between 1871 and 1962, the Colombian government promoted and enforced the migration of lepers into a specific site, seeking to mitigate the social and medical anxieties that such disease historically produced on healthy subjects. This leper colony was a site of strict isolation, where both in-migration of non-lepers and out-migration of lepers were prohibited. Such policy was part of a longer history of isolation and exclusion of lepers, who have been de facto discriminated against and excluded since antiquity.

To investigate the long-lasting legacies of such historical process, this project seeks to employ a lab-in-the-field approach coupled with a field-survey in what used to be the largest leper colony in Colombia, as well as in two of its contiguous municipalities. As will be shown, conducting the

experiments in these locations allows for a comparison that reduces the scope for unobservables as confounders that could explain potential behavioral differences. The main object of study will be the heterogeneous effects on solidarity experienced in the site historically marked by social exclusion. To do so, the project will mainly measure the in-group and out-group pro-sociality of subjects in both the former leper colony and in its contiguous municipalities, statistically testing the significance of differences in such behaviors. The main experimental design employed will be two types of Dictator Games: One where the recipient is someone from the same community, and a second one where the recipient is from a distant city.

Considering that altruism is a key ingredient in social capital (Bowles and Gintis, 2002), a differential effect of exclusion on such dimension of social preferences could also map into distinct degrees of engagement and trust in both local and national political dynamics. This project will thus collect survey-evidence to directly assess subject's engagement in local and national political processes, as well as their degree of trust in local and national bureaucracy. Such an approach will allow one to test for the political consequences associated with a long-lasting history of exclusion. Combined, the collected evidence would speak to a broader political economy issue by pointing to the consequences of segregation and discrimination of social groups on the strengthening of social and political in-group bonds vis-à-vis the weakening of such bonds when it comes to the macropolitical structure to which they belong (in this case the nation).

Further, and in line with the adverse effects of colonial medicine that have been documented in other regions (Lowes and Montero, 2018), the project will also inquire on the potential detrimental long-lasting effects that may derive from an enforced and inhumane medical policy of strict isolation and abandonment of ill people. Survey evidence on trust in physicians and on the adoption of health policies recommended and provided free by the State will be collected in the aforementioned sites to assess the detrimental effect on health policies and in contemporary medicine.

This project is directly related to several strands of literature, specifically in the experimental, the development, and growth literatures within economics. First, it contributes to investigations within experimental economics that examine social identity and group-membership as determinants of social preferences. In that vein, Goette et al (2006) exploit random assignment of individuals to platoons during an initial phase of officer training in the Swiss Army to show that belonging to the same groups fosters in-group cooperation and enforcement of norms. Chen and Li (2009) find a sim-

ilar result in a lab setting, where they find that matching participants with ingroup members leads to an increase in concerns for charity, rewards for good behavior, while reducing the ingroup punishment against bad behavior. Further, Goette et al (2012) compare minimal groups with groups with social interactions to show that ingroup cooperation is strengthened when adding social ties and that punishment for defectors may in decline in such situations.

Considering the behavioral salience of group membership, along with the potential gap between lab results and field results, a strand of the experimental literature has opted for a lab-in-the-field approach to assess the implications of group identities in specific social contexts. Carpenter et. al (2004) were among the first to conduct experimental sessions in the field to attain estimates more applicable to specific questions of social capital and development, which they achieved by conducting voluntary contribution games in the slums of Bangkok and Ho Chi Minh. More recent literature has continued to examine social norms of pro-sociality towards socially disadvantaged/marginalized communities. In that fashion, Bajrami et. al. (2017) examine prosocial attitudes towards refugees and find that senders in a dictator game who hold left (right) political views exhibit higher (lower) levels of altruism towards the refugees. Similarly, Govindam (2018) shows that ingroup norms determine the degree of altruism that high-caste individuals display towards low-caste ones. This project follows this literature in adopting a lab-in-the-field approach to investigate social norms in specific contexts. However, its focus is the in-and-outgroup social preferences of a community historically marginalized.

Crucially, this paper belongs to a literature that investigates the historical roots of social norms and economic behavior, particularly in the context of developing economies (Nunn and Watchekon, 2009; Dell, 2011). Specifically, it is part of a burgeoning literature that employs field experiments and field surveys in assessing the consequences of geographically-specific historical configurations. Lowes et. al. (2017) conduct field experiments in Central Africa to show the legacies of the historical territorial expansion of a centralized state on contemporary cheating behavior. Similarly, Lowes and Montero (2018) examine the geographical delimitation of an extreme case of colonial extraction in the present-day Democratic Republic of Congo, finding that historical exploitation does not only affect current wealth but also increases trust between the subjects who currently inhabit former sites of exploitation. Further, Valencia-Cacedo and Voth (2018) examine the spatial distribution of former Jesuit missions in modern day Paraguay, Brasil and Argentina to show the lasting implications of

such an intervention on prosocial behaviors.

Finally, this paper is directly related to recent studies that examine the lasting negative legacies of unconsented medical interventions, which have been imposed both in developed and developing regions. In that vein, Alsan et. al. (2018) investigate the long-lasting consequences of the Tuskegee syphilis experiment on contemporary health outcomes and health-related behavior of black men in America. Similarly, Lowes and Montero (2018) demonstrate the negative effects on health outcomes and on trust in modern medicine deriving from a colonial policy that forcefully vaccinated subjects in specific regions in Africa. Considering the medical justification that was used in isolating and marginalizing the lepers, this project also intends to directly measure the unintended consequences on trust on medicine deriving from the imposition of unconsented health policies.

The rest of the paper is organized as follows. Section 2 provides the historical background on the stigma to which lepers have been subject, along with the specificities of the isolation and the experiences of Colombian lepers in Agua de Dios, the leper colony under scrutiny. Section 3 describes the methodology that will be employed in testing the lasting effects of the social exclusion of lepers. Section 4 will be destined to assess the main results, and section 5 will conclude.

2 Historical Background

This section reviews the history of lepers' segregation, both globally and locally. Before proceeding with such a recount, a word on the medical aspects of the disease is required. Leprosy, which is formally known as the Hansen's Disease, is a long-term bacterial infection that is believed to be transmitted mainly through nasal droplets. Despite its prevalence throughout human history, it is not a highly infectious disease. This is due to two main reasons: It is not sexually transmitted, and it requires a genetic predisposition both for its transmission and its contraction. The main symptoms of the illness are neuropathic pain, sensory loss in the extremities, skin lesions and the deformation of cartilages. The mortality of the disease is nearly negligible, and in most cases it does not significantly affect the quality of life or the capacity to work or to be employed in any occupation -notwithstanding the social stigma-. Currently, the disease has been eliminated as a global public health problem, although some sites of endemicity prevail in some developing countries such as Indonesia, Brazil, India, Democratic Republic of Congo, and Madagascar.

The disease initially presents no manifestation and it may remain latent for as much as two

Figure 1: Manifestation of Advanced Leprosy



This image shows a severe case of leprosy before and after administering the treatment available today. Source: Guedes Salgado, Claudio and Josafa Goncalves Barreto. 2012. Leonine Facies: Lepromatous Leprosy. *New England Journal of Medicine* 366:1433.

decades. In most cases, the immune system is able to eliminate the infection before the occurrence of any physical manifestation. It is only in those cases of advanced infection that the illness becomes visually unconcealable (see Figure I), and in those cases the lesions may be worsened by the increased likelihood and frequency of lacerations deriving from sensory loss. It is only this advanced, visually recognizable, stage of the disease which has been historically subject to social stigma and official discrimination and exclusion across the globe.

Kuzban and Leary (2001) explain stigma against people suffering from noticeable diseases or disabilities as an evolutionary response aimed at avoiding or reducing the 'fitness-costs'. Exclusion of individuals suffering from leprosy (or from other noticeable disease or physical/mental disability) would therefore be an adaptive mechanism of humans in reducing the costs of social interactions that would follow from having dissimilar individuals being part of the social group. Consistent with what will be discussed in the remainder of this section, rejection of advanced cases of leprosy can be thus understood as an evolutionary response that has been present for most of human history. The above thus suggests that the isolation of lepers into leper colonies is the official endorsement and enforcement of a very long-run process of marginalization and exclusion of those suffering from the disease.

2.1 Leprosy since Antiquity

The stigma against those suffering from leprosy can be traced back to antiquity, as demonstrated by the perceptions consigned in the book of Leviticus in the Old Testament. The relevance of such source comes not only from the fact that Christianity became a preeminent ideological force in the Western World, but also because the book was taken by ecclesiastical and official authorities as a source to be followed literally when it came to the administration of public affairs. The message that transcends from such book is that God considers leprosy as something not intended for his people, meaning that whomever suffered from such malady was intrinsically an exception to God's plan (Rawcliff, 2006; Rawcliff, 2012). Such message entailed a clear prescription on how to administer such disease: If its existence was not intended for God's people, and therefore was outside God's plan, then people suffering from it did not belong in a society devoted to God. Therefore, the message transmitted by Leviticus entails an axiomatic need for the Lepers to be marginalized and excluded from society, a prescription that would be followed by public authorities during the Middle Ages and would survive until modern times.

The dissemination of leprosaria in Europe during the High Middle Ages is evidence of the marginalization that lepers continued to suffer in such period. Located in small houses in the outskirts of towns and cities, these leprosaria were destined to reduce the anxieties experienced by healthy subjects who wanted to avoid contagion of the disease (Miler and Nesbit, 2014). Strict segregation was endorsed and promoted by the Catholic Church, as demonstrated by the The Canon XXIII of the 3rd Lateran Council in 1179, which stipulated that the leprous had to have their own churches, congregations and burial sites. The negative perceptions against lepers were intensified with the advent of the Black Plague, after which the aversion towards the community of the ill led to a public administration that emphasized even more social exclusion and physical segregation than before.

Between the XVth and the XVIIth century there was a stark reduction in the number of European leprosaria, which coincided with a significant decline in the number of leprosy cases in said continent. However, the disease regained momentum in the colonial world, where the extreme version of the exclusionary practice was imposed by the European empires. The Spanish Empire, for instance, created 13 leprosaria throughout its American territory to facilitate the strict segregation of the ill. The administration of lepers gradually changed in the Colonial and Post-Colonial World, shifting

from a decentralized management of the lepers in the periphery of cities, to a more centralized version characterized by a handful of towns, all of which were expected to harbor and contain a greater number of cases. This transition was in large part the result of the recommendation of the European Medical Association and subsequently of the First Congress on Leprosy held in Berlin in 1897, which declared (mistakenly, as would be realized decades afterwards) the disease to be dangerous and highly contagious (Obregon, 2004). The main object of analysis for this project, the leper colony of Agua de Dios in Colombia, is one of such cases of centralization, as it was the largest out of the two sites where the exclusion of Colombian lepers was officialized via strict isolation.

2.2 The Leper Colony of Agua de Dios

In 1871 the Colombian Government officialized the foundation of what would become the largest leper colony in said country. Located to facilitate access from Colombia's Capital and thus to facilitate the transport of the ill into the colony, Agua de Dios harbored nearly 70% of the population of lepers –in Colombia, with approximately 8000 lepers living there by the XXth century. Although not large by contemporary standards, the size of Agua de Dios at the time gained international reputation, and it even led to Colombia's denomination as 'The Land of the Lepers' by the New York Times in 1906. Initially, the isolation of lepers into said town was sponsored by the state and was facilitated by the existing social stigma. Later on, and in line with other experiences of what has been termed 'colonial medicine', the reclusion of lepers into such colony began to be strictly supervised and enforced by the state in 1905.

The Colombian Central Hygiene Board was made responsible for establishing the guidelines on how to administer the population of lepers, and the plan set forth by said agency was followed minutely by the Colombian State. Among the policies established by the Board was the creation of distinct coins and distinct bottles to be used exclusively by those isolated in the colony, in order to avoid contagion through the spread of the bacteria (Ramos-Arenas, 2008). What's more important, a series of rules and procedures were set at the national level to ensure the effective seclusion of all the lepers in Colombia. All citizens had the legal obligation of reporting anyone who suffered from any deformation or physical manifestation akin to leprosy, and the town/city in which such report took place had the obligation to provide a physician who could examine both the suspect and his/her

Figure 2: Disinfection House



This is a picture of what used to be the site where all authorized, temporary visitors, had to pass by for disinfection before leaving Agua de Dios. Source: Ramos-Arenas, Manuel Jose. 2008. Agua de Dios: Cristalizacion de un Proyecto Pionero de Asistencia Publica: 1907-1960. Universidad Javeriana, mimeo.

relatives. Any trace of the bacteria would be sufficient to force the displacement of the subject into the leper colony.

Secluded lepers lost their citizenship as soon as they entered into the colony, and their isolation was enforced by a system of fences and military supervision. No family member -no children, parent, or couple- was admitted in the colony if found healthy, regardless of the human implications and the material consequences of separating the family. Aside from physicians, members of religious orders, and authorized merchants, no one entered or left the site, and even they were forced to sleep outside the Leper Colony and were forced to pass through a strict protocol of disinfection in which the bodies of the incoming or outgoing subjects, along with any good they could carry, were meticulously scrutinized and cleaned.

Only those who had been proven to be infected with the bacteria could live in Agua de Dios, and once they came into said Leper Colony they could never come out, regardless of whether the symptoms stalled or even improved. Family members who traveled with their ill relatives to say farewell were forced to do it in the bridge that connected Agua de Dios with Tocaima, the nearest town. Named as 'The Bridge of the Sights', the bridge that constituted the official entrance into Agua de Dios was a testament to the pain and the emotional scars inflicted on those who were forced to say farewell to their relatives for good. The administration of the ill continued once in the colony, as the leprous were forbidden to engage in intimate relations of any sort.

The trauma experienced when entering Agua de Dios, which persisted with the control of the

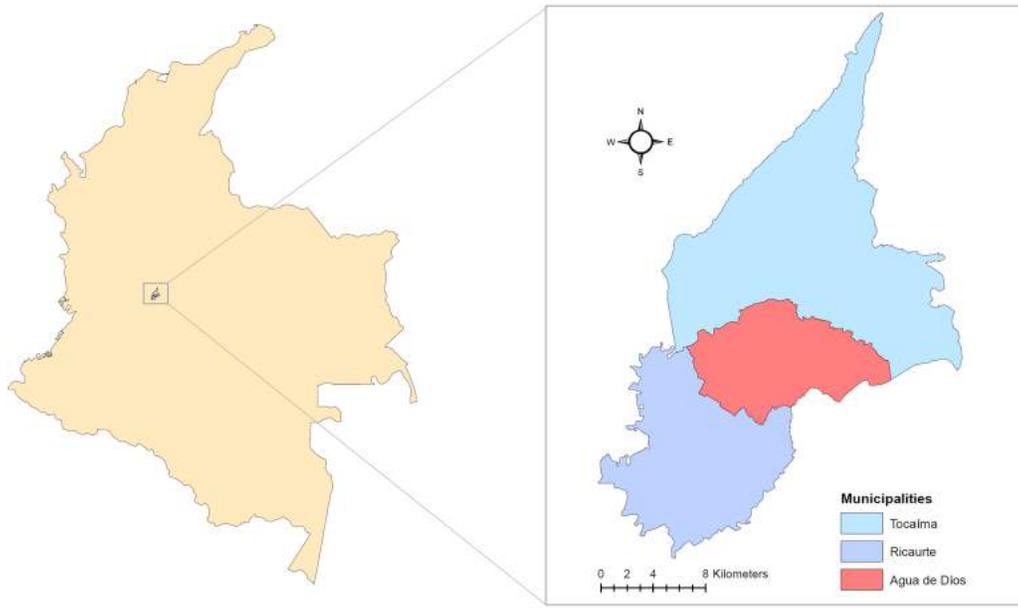
Figure 3: The Bridge of Sights



This picture, taken in 1920, captures the moment where family members were saying farewell for good to a group of lepers entering Agua de Dios. Source: Botero-Jaramillo, Natalia, Jessica Mora-Blanco and Nelson Daniel Quesada-Jimenez. 2017. *Historial oral y memoria de los enfermos de Hansen en dos lazaretos de Colombia: trayectorias de vida, conflictos y resistencias*. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro 24(4): 989-1008.

intimacies of the ill, contrasted with the joyful social atmosphere that was maintained between lepers living in said town. Historians have stressed the warm and vivid social life that was held within Agua de Dios, which was the result of strong bonds akin to those of a newly formed families (Plata Rueda, 2007). Most of the community participated in Balls, beauty contests, masquerades, as well as in the celebration of religious and republican festivities, all of which resulted from the strong social bonds that characterized the leper colony (Botero et al, 2017). Further, in-group pro-sociality became the hallmark of the isolated community, as its members managed to support each other and selflessly help each other when building houses and basic infrastructure (Ramos-Arenas, 2008). The shared pain of enduring a social stigma and the shared exclusion thus cemented a solid and intense social exchange between those who suffered leprosy. On 1961, once the policy of segregation was lifted and the Colombian citizenship was granted back to the lepers, most chose to remain in what used to be the colony. Although currently leprosy has nearly vanished from the Colombian landscape, scholars who have studied the leper colony of Agua de Dios have used anecdotal evidence in suggesting that its history constitutes a cultural heritage that is cherished by most of its inhabitants (Botero et al, 2017). Considering the persistent stigma against leprosy, along with the trauma that may have been experienced by the ancestors of today's residents, it is not self-evident that current inhabitants of Agua de Dios cherish its town's history, or if instead they prefer to rewrite a new story that is dissociated from the social prejudices against leprosy. By directly testing knowledge of the town's history as a source that conjures social solidarity, this investigation will be the first to empirically examine whether inhabitants of Agua de Dios look upon its history of internal social solidarity as

Figure 4: Agua de Dios



Map of Agua de Dios's location.

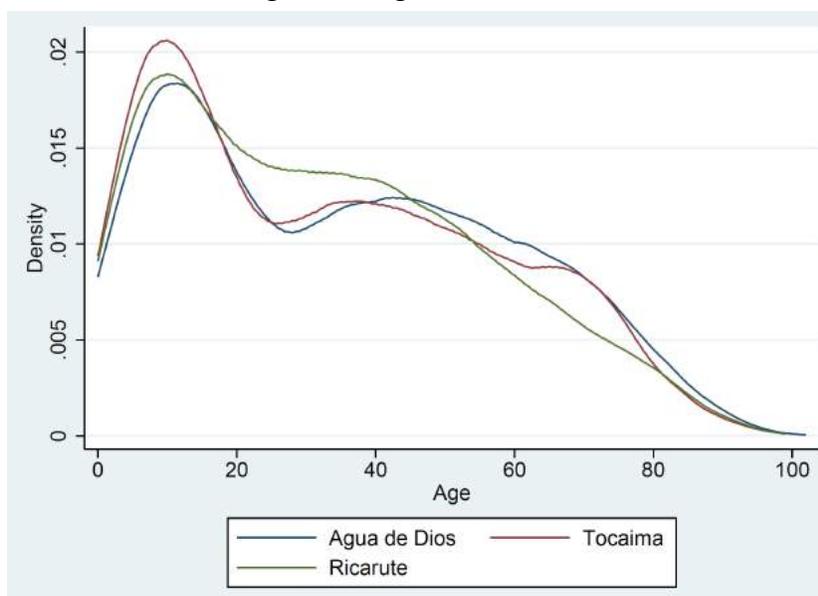
something that they collectively cherish.

3 Empirical Approach

This document will exploit the clear and enforced geographical delimitation to which Agua de Dios was subject, and use that to examine the effects of a community's historical exclusion on its pro-sociality, social capital, and trust in modern medicine. Field experiments and survey-fields measuring such dimensions will be implemented and conducted in the geographical area where the leper colony used to be located. Specifically, sessions will be conducted both in Agua de Dios and in the geographically contiguous towns of Ricaurte and Tocaima (see Figure IV). To the extent that the proximity of such sites reduces the scope for unobservables as confounders, comparing the responses and actions of subjects in these sites allows for clean estimates of the long-run effects of social exclusion.

Considering subjects in Tocaima and Ricaurte as comparison groups also addresses potential concerns over the endogeneity of the location of the former leper colony. Particularly, both of these sites were established before the existence of the leper colony, whose location was decided and imposed by the government. Out- and in- migration of subjects into these municipalities following the foundation of Agua de Dios would in fact operate against finding a higher altruism in the former leper

Figure 5: Age Distribution



This figure depicts the (kernel) age distribution of Agua de Dios, Ricarute, and Tocaima, showing that the age structure of the three municipalities are almost identical. Source: Colombian Census, 2005.

colony, as only those with a higher tolerance for being closer to the socially excluded would find it beneficial to move into (or to stay in) such towns. Table I documents further the remarkable similarity of these municipalities in terms of their gender composition, and ethnic composition, so that demographic factor is another source of alternative explanation that is ruled out when using the towns as a control group. Further, Figure V shows that the age structure of the towns, another potential confounder, are remarkably similar too.

Table I - Baseline Characteristics			
	<i>Agua de Dios</i>	<i>Tocaima</i>	<i>Ricarute</i>
Foundation (Year)	1870	1544	1857
% Female	47%	46%	47%
% Mestizos	98%	98%	92%
% With Local Mother	65%	72%	54%

There are differences in other dimensions that could explain current differences in pro-sociality and social capital. Notwithstanding the fact that geographical proximity should reduce climatic differences, it could be the case that the location selected by the government suffered from specific unfavorable conditions that could lead to the formation of informal insurance networks or to the emergence of significantly different economic activities in Agua de Dios. Table II evaluates the scope

for such alternative, showing no statistical differences between the municipalities when considering ruggedness, temperature or temperature volatility. Further, although a statistical difference is found in precipitation and precipitation volatility, it is a minor difference in magnitude (only 20 millimeters more of rain per year, and a 1.4% lower coefficient of variation), and it is a favorable one for Agua de Dios, so that the emergence of informal insurance in such municipality is actually less likely.

Table II - Climate			
	Mean Values		s.e.
	Agua de Dios	Contiguous Municip.	
Ruggedness	0.912	0.817	(0.198)
Obs.	79	384	
Temperature	27.032	26.425	(0.538)
Obs.	79	384	
Temp. Seasonality	39.473	40.051	(1.007)
Obs.	79	384	
Precipitation	2,008.174	1,979.19	(1.972)***
Obs.	79	384	
Precip. Seasonality	42.689	44.048	(0.069)***
Obs.	79	384	

An alternative channel that could explain the results comes from long-run implications that isolation could have had on human capital and/or economic activity, which could explain differences between the municipalities for reasons different than social exclusion. Table III addresses such possibility, examining differences in educational attainment, educational quality, and economic activity as proxied by luminosity of nightlights. There appears to be no differences in the levels of educational attainment, as demonstrated by the insignificant differences in the share of people who have primary or secondary education. Further, the quality of the education received appears to be remarkably similar between these municipalities, as shown by the insignificant differences in both the scores and the position in the national distribution of the results for the state-test that all Colombian nationals have to take when completing high school (ICFES). It thus comes as no surprise to find no significant differences in economic activity (as proxied by luminosity of nightlight) between Agua de Dios and the contiguous municipalities.

Table III- Human Capital and Economic Activity			
	Mean Values		s.e.
	Agua de Dios	Contiguous Municip.	
<u>Educational Attainment</u>			
Primary	0.939	0.954	(0.016)
Obs.	1,984	7,538	
Secondary	0.336	0.293	(0.024)
Obs.	1,984	7,538	
<u>Educational Quality</u>			
Icfes Scores	43.289	43.604	(0.153)
Obs	362	491	
Icfes Percentile	56.588	58.341	(0.815)
Obs	362	491	
Icfes Score (Altern)	42.993	43.339	(0.148)
Obs	362	491	
<u>Economic Activity</u>			
Light Luminosity	9.715	11.171	(4.922)
Obs	79	384	

Health outcomes constitutes another channel through which current differences in social norms could be explained. Despite the fact that leprosy in most cases does not significantly endanger the ill nor does it affect their quality of life -if not for the stigma associated to the disease-, worse health conditions could be a long-run consequence associated to isolation, so that differences in contemporary altruism could be driven by worse health conditions today rather than by historical segregation and exclusion. Table IV examines subjective health measures from the latest Colombian Census data to address such possibility. The data shows that, if anything, subjects of Agua de Dios consider themselves to be in better health conditions than those in Ricaurte and Tocaima.

Table IV - Health			
	Mean Value		s.e.
	Agua de Dios	Contiguous Municip.	
Eye Health	0.991	0.927	(0.008)**
Obs.	2,516	9,335	
Arms Health	0.985	0.983	(0.005)
Obs	2,516	9,335	
Walking Health	0.976	0.96	(0.005)*
Obs	2,516	9,335	
Hearing Health	0.994	0.975	(0.000)***
Obs	2,516	9,335	

All in all, when considering data along various dimensions one finds that subjects in Ricaurte and Tocaima constitutes reasonable control group when examining the long-run effects of exclusion, and that any existing difference would operate against finding higher solidarity in Agua de Dios .

3.1 Experimental Design

The main experimental tool that will be employed to measure pro-sociality is the Dictator Game. Such an experiment asks subjects to divide a given amount between themselves and another randomly chosen, anonymous, subject. As noted earlier, there are two types of pro-social behaviors that this paper intends to examine: Ingroup solidarity (that is, with peers from the same community) versus outgroup solidarity (that is, with respect to subjects belonging to a clearly distinct, and historically not excluded, social group). Further, the experimental sessions will be complemented with surveys on subjects' political preferences, political behaviors, and trust in modern medicine.

The sessions (6 in Agua de Dios, and approximately 4 in both Tocaima and Ricaurte) will be conducted in the school of each of the three towns. Each session will consist of approximately 20 subjects, who will be in a waiting area while someone reads out loud -twice- the instructions of the Dictator Game (explained below). After receiving the information, the subjects will be called one by one into a private area where they will be alone with the interviewer. The interviewer will collect the information below and will remind the subject another time what is expected of them. Specifically, the steps that each subject will be asked to follow while in the private area can be divided into four sections.

3.1.1 Entry questions

The first section entails a first set of questions that entail a low risk of tainting or biasing the actions of the subject in the experiment. The first set of questions, which will be read out loud by the interviewer, are the following:

1. What is your age?
2. What is your marital status?
3. Did you complete primary education? Secondary? College?

4. Did you vote in the last presidential election?
5. Did you vote in the last election for mayor of the town?
6. On a scale of 1 to 10, how big do you consider political corruption at the national level to be?
7. On a scale of 1 to 10, how big do you consider political corruption at the local level to be?

3.1.2 Dictator Games

The second set of steps, the ones involving the Dictator Game, comes after answering the above. The interviewer will first show the template with which the information is being collected, emphasizing the fact that there are no individual identifiers that could allow for the possibility of identifying the subject and linking her with her decision after the study is completed. The interviewer will then hand the subject 8 bills of COP\$ 2000 (for a total of slightly more than half of a daily minimum wage), along with an envelope that reads “Money for a random person in this town”. The envelope will be white and will be numbered inside and with a small font, which will allow to link the amount allocated by the dictator with her demographic characteristics and other potential controls.

The interviewer will remind the subject that any decision she makes is anonymous and will not be observable by anyone, and that she can keep whatever amount she chooses for herself. Further, the interviewer will tell the subject that any amount that she doesn't keep must be placed in the envelope, and that such amount will be given to someone random in the town. The interviewer will state that the random receiver will be told that the money was given by another anonymous resident of the town as a decision in a study. Further, he will provide a card with the contact information of the principle investigator (email, telephone and affiliation of Diego Ramos-Toro) and will tell the subject that should she choose to verify the delivery of the money to the receiver, she can contact the principle investigator through phone or email at all times ¹.

The interviewer will then instruct the subject to go to a booth (similar to a voting booth), where she will have privacy to make the decision, and where she should deposit the envelope in an urn. The content of the urn will be visible from the outside, and it will be filled from start with lots

¹Although not all participants will have email, the mere act of providing the email will create a signal that the research team is committed to handing the money after the session.

of envelopes of identical appearance to the one held by the subjects, which will reduce their concerns regarding the anonymity of their decisions. These exact steps will be repeated a second time, with the only difference that the second time the envelope will read “Money for a random person in Anapoima” (and the interviewer’s reminder will also make emphasis that this second envelope will go to someone in Apulo, another municipality with comparable average incomes and similar demographic composition, that is nonetheless approximately an hour away by car).

All in all, each subject will have the chance to earn as much as COP\$ 32000 (slightly more than what a subject could receive for day of work under a minimum wage). Everyone who participates in such session will be playing the role of a Dictator, and this will be common knowledge (it will be part of what will be read out loud to all subjects when coming into the site where the experiment will be conducted). Further, the receivers of the envelopes will be indeed picked at random (either in the same town of the experiment, or in Apulo, as per the instructions read to the participants of the experiment), and any subject interested in knowing more about the receivers in the aftermath of the experiment will be provided with aggregate amounts provided to the receivers (number of receivers per town, summary statistics of the allocations given to them, and testimonies from at least one receiver per town).

3.1.3 Post-Experiment Questions

The third section of the session will be devoted to ask a second set of questions, which by virtue of their content will be asked after the ‘dictator decision’ to avoid biasing such results. The questions, which will be read out loud by the interviewer in the private area, are the following:

1. On a scale from 1 to 10, how much do you trust national civil servants?
2. On a scale from 1 to 10, how much do you trust physicians?
3. On a scale from 1 to 10, how much do you trust local civil servants?
4. On a scale from 1 to 10, how much do you trust universities?

On a scale of 1 to 10, with 10 being “very much like me” and 0 being “not at all like me”, how similar are you to the following hypothetical people...

5. ... Someone who believes it to be very important to help and assist others selflessly?

6. ... Someone who believes the vaccine against the human papillomavirus poses a risk to human health?

7. ... Someone who believes God to be central in his/her life?

3.1.4 Survey Experiment

This fourth and final set of questions is aimed at assessing the specific mechanisms behind the results on pro-sociality. Subjects will first be asked an additional question directly assessing solidarity with respect to the Venezuelan refugees coming to Colombia. The interviewer will start by stating the following:

- “The recent political crisis in Venezuela has led to a wave of refugees seeking shelter and economic stability. Accepting such refugees entails allocating an important share of the budget to ensure their material wellbeing, along with their proper access to health care...”

Such statement will be complemented by either (or none) of the two following pieces of information:

- There have been various reports of the mistreatment of Venezuelan refugees by many Colombians in Santander, Bogotá and Cúcuta, including xenophobic insults by politicians, along with the explicit banning of Venezuelans from some public and private spaces².
- The material vulnerability of Venezuelans and Venezuelan refugees has led to an outbreak in measles, a disease that manifests physically as a red, flat rash that spreads throughout the body, and that has generated resistance and anxiety by health and civil authorities, along with rejection by civilians in Colombia³.

Subjects will be randomly assigned into one of the following three groups: Those who receive no information, those who receive only the information about xenophobia, and those who only receive information about measles. After randomly receiving the information as per such groups, the interviewer will ask the following:

1. ... On a scale of 1 to 10, how much of a priority do you think should be given by the state to assisting the Venezuelan refugees?

²See <http://www.vanguardia.com/area-metropolitana/bucaramanga/409277-xenofobia-en-bucaramanga-denuncian-agresiones-verbales-a-venez>

³See <http://www.elnuevoherald.com/noticias/mundo/america-latina/venezuela-es/article206978699.html>

After such survey experiment, and to test other possible mechanisms leading to solidarity, the interviewer will ask the following three questions ⁴:

2. On a scale of 1 to 10, how much do you know the history of this town?

3. How many of your grandparents were born in this town?

4 . How many of your grandparents were born in Agua de Dios? (To be asked only in Ricaurte and Tocaima)

After completing these steps, the subject will be asked to step into a third area and to wait for the rest of the subjects to complete their sessions. An assistant will supervise those subjects who arrive into such third area, and ensure that they are not talking to each other while the whole subject pool completes the experiment. The session will have finished once every subject is in this third area.

4 Results

The results will be assessed along four axis: effects on solidarity, effects on social capital, effect on trust in medicine, and sources of heterogeneity. A first step will be to examine how balanced are the sample of subjects interviewed in each town. Hence, the balancedness of the demographic characteristics (questions 1-3 in subsection 3.1.1 above), religiosity (question 7 of subsection 3.1.3) and trust on the researcher (as proxied by 4 of subsection 3.1.3) will be first examined. This will allow to control for any accidental unbalancedness that may arise in the process of recruiting subjects for the experimental sessions. In what follows, questions for which 95 percent of observations have the same value within the relevant sample will be excluded from hypothesis tests, and standard errors will be clustered at the level of the experimental session. All results will be assessed in different specifications: Without controls, controlling for the dimensions that resulted in accidental unbalancedness, and controlling for the full set of demographic controls. Further, as this constitutes a one-shot session per subject, this exercise is not vulnerable to attrition.

⁴This question is asked last as it could systematically affect the results in Agua de Dios if asked before.

4.1 Examining the Effects on Solidarity

The main outcome of interest in this project is the effect of historical social exclusion on solidarity as captured by pro-sociality. To that end, the outcome variables assessed in this subsection are in-group solidarity (amount allocated by the dictator to the subject in her town), out-group solidarity (amount allocated to the subject in Anapoima), and an abstract measure of solidarity that does not address in- or out-group considerations (captured by two variables: The sum of the two former allocations, which provides a behavioral aggregate altruism, and question 5 of subsection 3.1.3 above, which provides a survey measure of abstract altruism). To that end, the main specification that will be estimated is:

$$Y_i = \alpha + \beta AD_i + \theta' \mathbf{X}_i + \varepsilon_i \quad (1)$$

Where Y_i is each of the four variables specified above, AD_i takes the value of 1 for respondents in Agua de Dios and 0 otherwise, and \mathbf{X}_i are the set of controls discussed above. Following the discussion in sections 1 and 2, we expect β to be positive and significant when examining the amount allocated to receivers of the same town, and β to be negative and significant when examining the amount allocated to receivers in Anapoima. Finally, the results regarding an aggregate/abstract solidarity, which ignores an in-and-out logic, could go either way: If the negative effects of out-group consideration outweighs the positive effects of the in-group considerations, we could then expect aggregate/abstract pro-sociality to be adversely affected by the historical experience of Agua de Dios (and vice versa). We expect β to have the same sign and similar degree of significance when considering the two measures of abstract/aggregate altruism.

4.2 Examining Mechanisms Explaining Pro-Social Behavior

4.2.1 Cultural Traits vs Town-Specific Social Norms

Although AD_i will be initially taken to be 1 for all respondents in Agua de Dios, a second analysis will focus on the ancestry in Agua de Dios to understand the mechanisms at work. Specifically, a new variable capturing the effect of having ancestry from Agua de Dios, $AD_{Ancestry}_i$, will be equal to the number of grandparents that the subject has in such town. The assessment of intergenerational transmission as a mechanism with the variable $AD_{Ancestry}_i$ comes from the interaction of such

variable with AD_i , which is achieved by estimating the following expression:

$$Y_i = \alpha + \beta(AD_i * ADAncestry_i) + \gamma ADAncestry_i + \delta AD_i + \vartheta' \mathbf{X}_i + \varepsilon_i \quad (2)$$

Considering that all subjects will be included when estimating equation (2), and due to the fact that there are different definitions of what constitutes in-group membership for subjects in different municipalities, the results in this subsection will focus on the out-group solidarity (i.e., allocation given by participant to subjects in Apulo) and on the abstract/aggregate measures of pro-sociality (i.e., survey responses to the general assessment of altruism, and the behavioral measure corresponding to the sum of the two 'dictator' contributions of each subject)⁵. Hence, this estimation will enable to disentangle the relevance of intergenerationally-transmitted traits from the relevance of town-specific social norms when explaining pro-sociality that ignores in-and-out group considerations. Specifically, the γ coefficient will capture the effect of intergenerational transmission net of the norms coming from local-dynamics, δ will capture the relevance of the persistence of town-specific social norms and dynamics net of the intergenerational component, while β will capture the joint effect of these components. We have no prior as to which of these dimensions plays a central role in shaping abstract altruism, or whether these dimensions jointly explain pro-social behaviors.

A second assessment of intergenerational transmission as a mechanisms will come from estimating equation (1), but focusing exclusively on respondents from Agua de Dios, and replacing AD_i with $ADAncestry_i$ ⁶. This will allow to examine whether the historical experiences of the subjects are the main determinants of the norms regarding pro-sociality *within* Agua de Dios (which would be the conclusion if the β s have the same sign and similar significance as those following the estimations from equation (1) in subsection 4.1).

4.2.2 Medical vs Social Exclusion

One of the key aspects to assess is the type of exclusion that triggered and continue to trigger the existing norms regarding pro-sociality. Specifically, considering that the exclusion and isolation of lepers responded to both a medical and a social logic, we wish to understand which of these two dimensions play a greater role in explaining current differences in pro-sociality. This section will

⁵This equation is well specified *if subjects with ancestry from Agua de Dios are found in Tocaima and/or Ricaurte*. We expect to find some degree of Agua de Dios ancestry in both Ricaurte and Tocaima.

⁶This will be the focus of the analysis of intergenerational transmission in case we do not find ancestry from Agua de Dios in Tocaima nor in Ricaurte

address such issue by examining the results of the survey experiment explained in section 3.1.4. Specifically, the following equation will be estimated:

$$Y_i = \alpha + \beta(AD_i * T1_i) + \gamma(AD_i * T2_i) + \vartheta T1_i + \theta T2_i + \psi AD_i + \varepsilon_i \quad (3)$$

Where Y_i will be the answer to the question about the priority that should be given to the Venezuelan refugees (question 1 in section 3.1.4), $T1_i$ will take the value of 1 if the subject was presented with the information about the xenophobia suffered by Venezuelans in Colombia and 0 otherwise, and $T2_i$ will take the value of 1 if the subject was presented with the information about the vulnerability of Venezuelans coming from measles. The estimators of interest here will be γ and β : A positive and significant β would indicate that the pro-sociality of subjects in Agua de Dios is triggered by social, non-medical, exclusion. Likewise, a positive and significant γ would indicate that subjects in Agua de Dios exhibit increased pro-sociality when they become aware of exclusion based on medical reasons. Comparing the size of these estimators will allow to test whether non-medical social exclusion constitutes a stronger trigger for solidarity than medical exclusion.

4.2.3 Historical Knowledge

A final mechanism that will be examined is knowledge of history as a mechanism that explains pro-social behaviors in Agua de Dios. Specifically, the following equation will be estimated:

$$Y_i = \alpha + \beta AD_i + \gamma(AD_i * History_i) + \theta History_i + \vartheta' \mathbf{X}_i + \varepsilon_i \quad (4)$$

Where Y_i will be the same outcome variables as in equation (1) of section 4.1, and $History_i$ will be the answer to question 2 of subsection 3.1.4. If history of Agua de Dios explains pro-social behaviors, we should then expect γ to capture part (if not all) of the statistical and economic significance of β . By examining the scope for history as a mechanism along various dimensions, this estimation will also allow to empirically examine the role of folklore and historical knowledge in reinforcing the patterns of in-and-out-group prosocial behaviors.

4.3 Examining the Effects on Social Capital

Considering that pro-sociality is a key dimension of social capital, we intend to examine the historical legacy of Agua de Dios's exclusion on both local-level and national-level social capital. Strong bonds

of in-group solidarity, combined with the fact that subjects in this town were historically forced to solve any material and social problem without the state's assistance, suggests that one should expect a higher local political engagement in Agua de Dios. Conversely, one should expect at least no increased engagement in national-level political processes, considering that subjects in Agua de Dios were altogether marginalized from these dynamics. This can be explicitly tested with the following estimation:

$$Y_i = \alpha + \beta AD_i + \vartheta' \mathbf{X}_i + \varepsilon_i \quad (5)$$

With Y_i being the response to question 4 of section 3.1.1 (participation in national-level political processes), question 5 of section 3.1.1 (participation in local political processes), question 1 of section 3.1.3 (trust in national civil servants), and question 3 of section 3.1.3 (trust in local civil servants). We thus expect to find a significant positive β when it comes to local social capital (i.e., when the outcome variable assesses political engagement and trust in politicians at the local level), and to be lower or equal to zero when it comes to national-level social capital (i.e., when the outcome variable assesses political engagement and trust in politicians at the national level).

4.4 Examining the Effects on Trust in Medicine

A final element to examine is whether there is a legacy of (mis)trust in medicine deriving from the experience of strict segregation based on medical criteria. There is no clear effect that we should expect a priori. On the one hand, isolation was based on imprecise medical knowledge, and the inhumane measures to which lepers were subject when entering Agua de Dios are thus associated to medicine. On the other, physicians and nurses were in constant interaction with the ill after their seclusion, and it is possible that such interactions resulted in emotional and/or physical healing, which could increase engagement and trust in physicians. To test which of these two effects outweighs the other, we will re estimate equation (5), but taking as outcome variables the responses to questions about trust in physicians and medical knowledge (questions 2 and 6 of section 3.1.3).

It is worth noting that equations (2) and (4) can be re estimated here to test whether intergenerational transmission and historical knowledge constitute mechanisms through which the historical experience of the leper colony affects current attitudes towards medicine and physicians.

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