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Isolation or Opportunity? Experimental Analysis of a Housing Program for Urban Slum Dwellers in India*

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Abstract

How does giving the urban poor an opportunity to relocate to higher quality but more remote housing influence their well-being in the long run? Slum relocation programs, which move slum dwellers from the city center to the periphery, are widely used, however relatively little is known about their effect. In this paper, we evaluate the long-run impact of a housing program in a large Indian city that offered 110 slum dwellers, chosen by lottery, a mortgage and the opportunity to purchase a new house located in a relatively distant residential complex. Roughly 14 years later, lottery winners and non-winners look similar in terms of income, work and children's outcomes. Winners are more likely to own a house than non-winners, but also live farther from the city center. Winners are more isolated from traditional family and caste networks and have less access to risk-sharing arrangements. Additionally, winners report both less social insurance and greater collective action to benefit the community than non-winners. These patterns suggest that isolation strengthened winners neighborhood ties but weakened their traditional family and caste relationships. This, in turn, reduced barriers to local cooperation but increased the correlation of risk within informal insurance networks.

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1 Introduction

Throughout the developing world, urban poverty is an increasingly important policy concern (Chen et al., 2007). A stark reflection of this is the high and growing incidence of urban slums: Today, over a billion people live in slums in developing countries (UN High Commissioner for Refugees, 2010). The growth of urban slums poses multiple challenges for city governments: Slum dwellers have significant unmet need for basic services *and* often occupy prime real estate in commercially important city centers.

An attractive proposition for many municipal governments, therefore, is to relocate slum dwellers to improved housing on the peripheries of cities. Slum relocation programs typically presume that the value of improved housing is adequate compensation for any costs incurred from living farther afield, such as diminished work opportunities or weakened social networks. However, the presumed high value of improved housing remains a largely untested proposition, as does the presumption that, once relocated, slum dwellers prefer not to remigrate back to the city center. More specifically, the coercive nature of many of these programs complicates any cost-benefit analysis, since it prevents us from inferring the actual costs and benefits to slum dwellers from their choices on whether to relocate to city periphery and for how long. For programs that are voluntary, cost-benefit analysis is made difficult by the fact that households that choose to relocate are likely different in several ways (in terms of socioeconomic status, work opportunities etc.). Finally, it is hard to generalize findings from programs implemented by municipal governments, since these agencies often base their decisions to relocate slums on political and commercial exigencies.

In this paper, we exploit a unique experimental opportunity afforded by a voluntary slum dweller relocation program undertaken by a leading trade union for poor self-employed women (Self Employed Women's association, hereafter SEWA) in partnership with the city government in the Indian city of Ahmedabad. This program had several

features that help us address the above concerns. First, it was conceived by a labor union that sought to prioritize its members' well-being. Second, while slum dwellers' participation in the program was voluntary, the actual opportunity to relocate was determined by a lottery conducted in 1987. This randomization of relocation opportunity allows us to tackle the concern that housing choices are typically endogenous to a household's social and economic outcomes, including education, health, and social networks.[1] Finally, the 497 households that entered the program were spread across several slums in the city center and represented an important group of informal sector workers namely, women who make unfiltered cigarettes, or *beedis*. (Over 1.4 million women in India earn a living doing this work, making it one of the largest female informal labor sectors (Office of the Registrar General, Census Commissioner, 2001).) Thus, we anticipate the impacts we identify should be reasonably generalizable to fast-growing cities in South Asia.

Households that won the housing lottery were given the opportunity to move into their new housing in a suburban neighborhood (from now on, Colony A) in 1993. We tracked and interviewed 443 lottery applicants (89% of full sample) roughly 14 years later in 2007. The random allocation of housing units provides a rare source of exogenous variation in residential location akin to the Moving to Opportunity experiment in the US (Kling et al., 2007). Moreover, the length of time that has passed since subjects were provided housing in the new location allows examination of outcomes over a uniquely long period.

We present Intent to Treat (ITT) experimental estimates in which we compare outcomes of those who won the lottery to those who lost it. Our first striking finding is that nearly 40% of households that won the opportunity to relocate to the urban periphery at a substantial subsidy bought the new home, but chose *not* to move into it. Low rates of relocation among selected households that worked hard to get access to this program presumably reflected the relatively remote location of the housing, which turned out to

[1] For example, we could mistake the effects of living in distant neighborhoods for the characteristics of households that choose to live in distant neighborhoods.

be farther from the city center than was originally planned. Given that housing quality was higher in the new location, we consider low rates of relocation as our first piece of evidence that geographic centrality is economically valuable to slum dwellers.

The remainder of our analysis sheds light on both the nature of this economic advantage and the response of poor households. Fourteen years after houses were built in Colony A, we see no difference in the economic well-being of winner and non-winner households, as measured by current income, labor force participation, educational attainment and the marriage patterns of their children. Winners, however, do live roughly one mile farther away from the city center, and have worse access to health (though not school) facilities. We also observe significant changes in family and neighborhood networks. Winners are approximately 18% less likely to have adult working sons live with them. Winners live further from their daughters and are 16% less likely to see their adult daughters frequently. Turning to neighborhood networks, winners are more likely to have bidi workers as immediate neighbors, but these neighbors are less likely to belong to the respondent's caste.

Lottery participants uniformly report that they rely on neighborhood networks for borrowing and lending needs. The changes in network composition are, therefore, reflected in winners stating that they are 7 percentage points less likely to know someone on whom they can rely for borrowing needs and have, on average, known this person for three fewer years. They also report less access to transfers and help during periods of shock.

To examine the economic impact of these changes in network, we consider two sets of outcomes. First, we make use of the fact that the urban poor in Ahmedabad faced a series of shocks over the last ten years (floods, earthquake and a viral epidemic). Winners and non-winners were as likely to be impacted by these shocks and lose, on average, a month's work as a result. The extent of informal help is relatively low, perhaps reflecting the aggregate nature of these shocks. That said, both in terms of whether they received any

help and the amount of monetary help received, lottery winners are significantly worse off.

At the same time, relative to non-winners, winners report more collective action to benefit their neighborhood over the last three years. While we cannot fully rule out the possibility that this reflects a greater need for neighborhood infrastructure, the fact that these differences in collective action show up more than ten years after individuals moved into the complex suggests that it is likely driven, in part, by greater willingness to engage in local public good provision.

The patterns suggest that moving to the city periphery weakened traditional (caste and family) network links and created new links with neighbors. Winners are also significantly less likely to report lending to or borrowing from someone outside of their neighborhood, suggesting that moving led to greater geographic isolation. The change in neighbor composition, in turn, has important implications for informal risk-sharing: Neighbors are significantly less likely to belong to the same caste and significantly more likely to be in the same occupation. While winners and non-winners are equally likely to socialize and rely on neighbors for help, risk-sharing capacity of occupation-based and residential-based networks is arguably lower. That is, closer links with immediate neighbors increase the feasibility of cooperation around a local public good, but reduce the capacity to risk-share in a setting where economic shocks have an important spatial component.

Taken together, our findings suggest that in the long run households are able to equalize across many margins of economic opportunity. Fourteen years after lottery winners received an opportunity for improved housing we find a relatively small (9 pp) difference in home ownership, and the value of housing stock is similar across the two groups. What is harder to maintain is networks — the shape of networks varies significantly across winners and non-winners, and it appears that while winners benefit from the community's greater willingness to provide public goods they face diminished risk-sharing opportuni-

ties. Qualitative evidence from in-depth interviews with a small sample of winners and non-winners conducted in 2011 supports this interpretation: While acknowledging the benefits of homeownership, winners were explicit about both the higher transportation costs and relative isolation induced by moving to Colony A. Our findings are also consistent with other evidence from India which relates low labor mobility (from rural to urban areas) to household reliance on traditional networks.

The remainder of this paper proceeds as follows. In Section 2 we discuss the theoretical and empirical literature that motivates the study. Section 3 describes the context of our study, the data-collection strategy and dataset. Section 4 describes the empirical strategy and provides the results, Section 5 describes our findings from in-depth interviews and Section 6 concludes.

2 Literature Review

To place our study in context, we describe the alternative forms of public housing assistance programs implemented for the urban poor, and then review the literature on the impact of such programs on the well-being of the urban poor.

2.1 Forms of Housing Assistance

Rent subsidies, as a form of housing assistance for the urban poor, have a long history in developed economies (Arnott, 1995). Often these rent subsidy programs are combined with voluntary housing relocation programs. Two well-known (and well-studied) programs in the US are the Gautreaux and Moving To Opportunity (MTO) programs. Under Gautreaux, nearly $7,000$ families were offered housing in suburban and urban neighborhoods with a black population of 30% or less (Office of Policy Development and

Research, 1979).[2] The MTO program covered 4,600 low-income families across five US cities. Starting in 1994, households were randomly allocated two types of housing vouchers: One group was "restricted" to using the voucher only in a location with a poverty rate below 10% while the other group was unrestricted. A control group received no voucher.

In developing economies, housing (and rent subsidies) are often provided by employers — for instance, in China there is a long history of state-subsidized housing for public sector workers (Wang, 2011). In some cases, the state provides social insurance by continuing to subsidize housing for unskilled workers by private employers (such as textile mills) after the employer declares bankruptcy (Field et al., 2008). That said, a dominant form of housing for the urban poor remains slum dwelling. Slum dwellers, typically, are either squatters or pay rent to a landlord. However, even in the latter case they tend to have tenurial insecurity as landlords have an incentive to provide short-term contracts in order to prevent renters from obtaining property rights (or long-run tenancy rights).[3] Consequently housing policy for the urban poor in low-income settings has often focused on improving property rights for slum dwellers, either in situ or via relocation (Field and Kremer, 2006).

Housing programs which seek to move slum dwellers to improved housing on the fringes of the city are growing in importance in the developing world. Below, we briefly highlight some important slum relocation programs in low-income countries.

India's Ministry of Housing and Urban Poverty Alleviation estimated a shortage of over 21 million houses for economically weaker sections in 2007, and several programs aim to increase supply and assist homebuyers (MHUPA, 2009).[4] In 2009, the Indian

[2] The program was a response to a lawsuit suggesting that Department of Housing and Urban Development (HUD) policy denied poor black families the opportunity to live in integrated neighborhoods.

[3] In the slums of Ahmedabad, a verbal ten-year guarantee of non-eviction from the municipal corporation is the most common form of tenure security (Baruah, 2010). Also, ownership rights are created for renters in the private market who occupy a dwelling and keep up with payments on a lease contract longer than 11 months (Dev and Dey, 2006).

[4] For instance, The Ministry of Urban Housing and Poverty Alleviation's Affordable Housing in Partnership scheme aims to build one million housing units for the urban poor that they can purchase

government unveiled an ambitious housing program for slum dwellers — the Rajiv Awas Yojana. A stated aim of the program is to relocate slum dwellers when on-site slum improvement is infeasible.

In Philippines, at the end of her second term in 2010, President Gloria Arroyo reported to have built and distributed houses to one million homeless Filipinos while in office. She claimed her programs were more successful than predecessors' due to the focus on nearby jobs (Inquirer, 2010). Finally, in Brazil, the *Minha Casa Minha Vida* (My House, My Life) program built one million homes between 2009 and 2011. It was considered such a success that phase 2 of the program is to build another 2 million units by 2014. While the government is making a large investment to fully fund construction, developers are pre-selling units to private investors (at a discount) who will sell finished units to low-income families at a price capped by the government.[5]

2.2 Impact of Housing Programs

An old and new literature supports the view that cities underpin long-term economic dynamism through the spatial concentration of skills and ideas, and other gains from agglomeration of production (Jacobs, 1970; Moretti, 2010; Glaeser, 2011). The size and sprawl of many contemporary cities combined with the residential segregation and spatial inequality of public services imply that access to markets and social networks may be highly localized even in population-dense environments (Hewett and R.Montgomery, 2001).

Programs that cause the urban poor to relocate may influence economic outcomes through several channels. First, they may influence the employment opportunities for beneficiaries. Second, they can alter investments in, and long-run outcomes for, children. Third, they may alter the peers and social networks of households and thereby related out-

with subsidized mortgages (MHUPA, 2011).

[5] For more details, see the project website: www.myhousemylifebrazil.com.

comes. Finally, changes in neighborhood characteristics may have significant externalities such as access to health care and exposure to crime.

Often housing programs also include an additional wealth effect — either directly by subsidizing rent or mortgage or indirectly by improving the household's asset base (by enabling access to credit markets through collateral).

Below, we first discuss the evidence on how relocation programs influence outcomes, and then turn to impacts of the wealth effect.

2.2.1 Location Impacts

Employment A first question is whether relocating poor households to improved housing in a new location creates a spatial mismatch between residential location and employment opportunities. Engleman (1977) exploited variation in council housing location to show that residential relocation farther away from jobs significantly increased the probability of quitting a job for men but not for women in Glasgow.[6] An important caveat is that the study had a low response rate (only 60% of the sample were interviewed), and the response rate was lower among the control group (relative to the mover group). More recent evidence comes from the Gautreaux and MTO programs. Individuals enrolled in the Gautreaux program who moved to locations with more low-skilled job opportunities were significantly more likely to be employed, controlling for human capital, family characteristics, education, and years since move (Popkin et al., 1993). It is worth noting that while evaluations of the Gautreaux program typically argue that location choice was exogenous, individuals had the right to refuse the first two locations the HUD offered them.[7]

[6] In addition to using a sample of 400 households who had been allocated council housing 6-10 months before they were surveyed, he identified a control group by randomly selecting a subset of families who were offered council housing in the next round of allocation. Surveying the control group at the same time as the movers group meant the control had been allocated council housing, but had not yet moved.

[7] Popkin et al. (1993) report that only 5% of households refuse the first location shown out of fear another housing offer will not appear, and approximately half of households end up in a location other than those for which they expressed a preference.

Some of the best data on this issue is experimental evidence from MTO. Rosenbaum and Harris (2001) find improvements in employment rates in the short term for MTO restricted-voucher recipients. However, interim and long-run findings do not find a statistically significant impact of the unrestricted voucher on employment or earnings (Kling et al., 2007).

For urban poor in low-income countries, moving workers to better housing in more distant locations often worsens their economic opportunities. Using data on renters in Mumbai, Takeuchi et al. (2008) estimate that households are willing to give up Rs. 280 to Rs. 330 per month to relocate 1 km closer to the principal workers job.

Child outcomes Geographic location determines access to schools and hospitals, health environment, as well as exposure to accidents and violence. Thus, programs that relocate households may potentially influence children's long-term outcomes.

Using data from the Gautreaux demonstration, Rosenbaum (1995) finds that, compared to youth who moved to urban locations, youth who moved to suburban locations are more likely to have jobs with good pay, though no more likely to be in college. However, in a later study of public housing demolitions in the same city, Jacob (2004) found that children in families who were offered the opportunity to relocate out of high-rise public housing did no better than their peers. Similarly, Oreopolous (2003) finds no differences in long-term labor market outcomes for adults assigned to different Toronto public housing projects as children: "...despite significant contrast in living conditions and exposure to crime across projects, neighborhood quality does not make much difference to chances for labor market success in the long run" (p. 1536).

The MTO demonstration found short-term reductions in injuries and asthma attacks in Boston (Katz et al., 2001). Longer-term studies using data from all five sites find improved educational outcomes and mental health for female children in households given vouchers to move to lower poverty neighborhoods (Katz et al., 2011). Girls' physical health was

unaffected. Male children in the same situation engaged in more risky behaviors and their physical health declined.

Social interactions and peer effects Relocation is likely to disrupt a household's social networks, and its impact on households will vary with both the composition of the new neighborhood and the relative ease of forming new ties. Long-run evidence from MTO shows that households that moved reported more social ties with relatively more affluent households and reported feeling safer. However, this change in peers and social ties did not lead to economic gains.

In low-income settings, residential segregation into religious, linguistic and caste-based enclaves is common (Vithayathil and Singh, 2011); relocation programs not based on these characteristics are likely to create neighborhoods with greater initial ethnic heterogeneity than those into which households would self-select. The accompanying cost of disruption of social networks may be relatively high. Takeuchi et al. (2008) explain the importance of social dimensions particular to South Asia: "...if households depend on neighbors of the same caste or ethnic group for information about employment or for social services, relocation to neighborhoods of different ethnicity may be welfare-reducing" (p. 1).

There are few quantitative estimates of the significance of neighbor effects in the urban areas of developing countries. Montgomery and Hewett (2005); Barnhardt (2009) are exceptions, but neither focuses on livelihood outcomes.[8] Kapoor et al. (2004) estimate models of location choice in urban India (Pune) and find significant costs from relocation in terms of disruption of religious and linguistic networks. Geographic isolation from one's peers or caste group could worsen employment outcomes by limiting information

[8] More broadly, peer effects are studied by several papers: Conley and Udry (2001) looked for the influence of farmers' success with fertilizer on a neighbor's future decision to use fertilizer and profits when fertilizer is adopted. Kremer and Miguel (2004) found that information about de-worming drugs was spread child-to-child and adolescents whose friends were randomly treated were less likely to take the drugs themselves. There is also evidence from Mexico that school attendance is influenced by students' friends (Bobonis and Finan, 2009), and in Kenya, students' performance on exams increased when their classmates became eligible for exam-based rewards (Kremer et al., 2004).

about job opportunities or disrupting business networks (limiting access to customers or capital).

An interesting study of the links between housing isolations, social networks and time investment choices is Ward (2006). He uses experimental data from undergraduate students living in Harvard College housing, and confirms that those randomly allocated to a location farther from the area where most students live and most activities take place participate less in central activities. Rather, they spend more time with local networks and local activities, with local networks becoming denser as a result. Students assigned to distant locations are also more satisfied with their housing and local public goods are more abundant there.

2.2.2 Wealth Impacts

Employment Effects Housing subsidies may encourage households to stay in locations that are undesirable along non-price dimensions. In India, Field et al. (2008) study location-based exposure to religious rioting and find more violence against Muslims in religiously integrated mill neighborhoods in Ahmedabad. They suggest households were more likely to stay in integrated neighborhoods — despite knowing the greater risk of communal violence there — because of high transaction costs around transferring property rights for homes in former cotton mill tenements. The loss of wealth associated with selling a mill home and moving to a religiously segregated neighborhood may have locked households into a neighborhood where they were less safe.

Less dramatically, subsidies may lock households into neighborhoods with fewer jobs (overall or for low-skilled workers, see for instance Hughes and McCormick (1981, 1985). [9] Iyer et al. (2011) show that in China, access to state housing subsidies caused households

[9] The authors analyze General Household Survey data in the UK and find Council Housing tenants were four times less likely to migrate to another region than owner-occupiers. They suggest a contributing factor to this difference was rent control, which limited the supply of rental units outside Council Housing (Hughes and McCormick, 1987).

to continue working in the public sector even when job opportunities were relatively better in the private sector.

Labor supply A related issue is whether wealth effects associated with rent subsidy programs create an incentive for recipients to work less. Nickell (1980) finds higher male unemployment rates among those renting public rather than private housing in the UK. In contrast, Ong (1998) considers a sample of women in the US and finds rental voucher recipients work considerably more than women living in public housing and those renting in the private market. Fischer (2000), however, finds a significant negative relationship between labor force behaviors (employment rate and hours worked) and receiving housing assistance when the two types of assistance are pooled. All three studies are observational and seek to account for selection effects by adding controls for various demographic and economic characteristics of the households. It is likely that these controls are unable to fully account for the potential self-selection of poorer households (with specific employment traits) into public housing. Jacob and Ludwig (2012) study a program that used a lottery to allocate over-subscribed housing vouchers to 18,810 families in Chicago. Compared to the 64,497 remaining families, labor force participation among adults receiving assistance were 6% lower and quarterly earnings 10% lower.

A second body of evidence directly examines the link between improved property rights and labor supply (holding location fixed). Field (2007) studied the impact of a titling program in Peruvian slums that was rolled out over time and finds that the net effect of titling (without relocation) is a combination of an increase in total labor force hours and a reallocation of work hours from inside the home to the outside labor market. There was also a significant reduction in child labor caused by stronger property rights. In short, when a dwelling did not require protection by a household member to ensure its continued possession, labor market outcomes were positive.

Children's Outcomes Galiani and Schargrodsky (2010) test the importance of formal

titling among slum-dwellers in Buenos Aires, using variation created by landowners' differential responses to government expropriation of their land to give it formally to poor households already living there. They find greater investments in children's education among those with formal property rights, but these investments are not financed through greater borrowing.

Credit Market and Housing Investments Both Field (2007) and Galiani and Schargrodsky (2010) find significant increases in housing investment when property is formally titled, but no evidence that these are related to improvements in access to credit. In both papers, investment effects appear to reflect changes in the incentives to invest as tenure security increases.

2.3 Gaps in the Literature

The MTO demonstration studies in the US have provided rigorous experimental long-term estimates of the impact of living in a neighborhood with a low poverty rate. The socioeconomic characteristics of neighborhoods have little effect on the economic self-sufficiency of adults, but do have some impact on girls' education and on health outcomes. There is also a rich literature on peer effects in the US, with papers like Ward (2006) and Sacerdote and Marmaros (2006) providing evidence that location choice influences networks and the extent of isolation influences investments.

Evidence for low-income settings is, however, much more limited. In this study we hope to address some of the gaps in the literature.

3 Background and Data

In this section we first describe the setting of our study and the study population. Next, we describe how the trade union conceived of the housing program and the design of the

housing lottery. After this, we describe our tracking of the lottery sample and survey design. We conclude with a randomization check on the tracked sample.

3.1 Slums in Ahmedabad

Ahmedabad, with a population of roughly 3.5 million, is India's sixth most populous city and the largest city in Gujarat, one of India's most industrialized and fastest-growing states (Ministry of Finance, 2007). The urban poverty rate in Ahmedabad, a densely populated metropolis (roughly 718 persons per square kilometer), is roughly 1.4 times the All India average at about 34% (Cities Alliance, 2002), largely on account of the steady decline of Ahmedabad's textile industry.

Housing for the urban poor came up in the vicinity of the textile mills, and either consisted of units rented out by the mills or informal settlements. A textile mill would typically attract migrant workers with similar occupational and caste backgrounds, which meant these neighborhoods were usually segregated by caste (Gillion, 1968). The decline of textile mills, which began in the 1960s and was most severe in the 1980s, significantly increased informal sector employment among these migrant workers(Breman, 2004). Their living arrangements, however, continue to consist of slums, chawls (multi-storied one room tenements with shared toilets) and pols (gated communities) in the eastern half of Ahmedabad (where most textile mills were located). Many of these slums continue to remain organized along ethnic lines (Hall, 1980).[10]

The housing stock in these neighborhoods is generally old and dilapidated, and access to public services more limited. However, these neighborhoods are near the commercial center of the city, where low-wage economic opportunities are most abundant (Bhatt, 2003). Residential mobility within the city remains low: in a representative sample of 933 households, Mehta et al. (1989) find an average mobility rate of 1.7% and in a survey

[10] Also see The Times of India, "Split Wide Open: India slinks into ghettos," 20 April 2002.

of three slums the average duration of the surveyed households' stay in the slum was between 14 and 23 years (Aandahl, 2002). Another important factor is the relevance of caste-based contacts in determining which trade individuals take up and where they live.

3.2 The Informal Sector

The urban poor in India predominantly work in the informal sector, and low-caste Hindus are over-represented in this group.[11] Over 80% of India's population belongs to the Hindu religion, and therefore born into a caste. Traditionally, the hierarchical caste structure determined an individual's occupation, with weaving defined as a lower-caste activity. Historic, social and economic disadvantage means that the average lower caste household is relatively poor. Thus, the weaving communities that migrated to Ahmedabad to work in the textile mills were relatively poor, and after the decline of textile mills in Ahmedabad their mainstay became informal sector employment.

By 1999 the informal sector accounted for about 76.7% of employment in the city and generated 46.8% of the city income (Unni and Rani, 2000). A very significant percentage of these informal sector workers were women. Seasonal employment and low and variable pay characterize this sector, particularly among the large number of vendors and home-based piece-rate workers that constitute the bulk of the population we will study (Unni and Rani, 2000).

Informal sector employment is also very sensitive to local shocks; Ahmedabad had a large earthquake in 2001, significant social unrest and riots in 2002, and an outbreak of the Chikungunya virus in 2006. All of these were significant negative income shocks for the urban poor in Ahmedabad.

[11] We refer to the informal sector as one with casual employment, as opposed to having contracts and formal guarantees (Organization, 1993).

3.3 SEWA Union and the Housing Lottery

The union for female informal workers in Ahmedabad, Self Employed Women's Association (SEWA) Union was formed as a trade union in 1972, and today has a membership of over 700,000 workers in all of India, with over 500,000 workers in Gujarat. SEWA describes its core role as organizing female informal sector workers so that they achieve secure employment and are economically self-reliant.

SEWA Union is organized as a collection of trade groups, one of which is beedi rollers. The Union began working with beedi rollers in 1978, when they campaigned with the government to get home-based workers included under labor laws. During this campaign, the Union found out that within the informal sector, the beedi industry is among the few trades that are regulated by law — The Beedi and Cigar Workers Act. Importantly, this act had a provision for government housing subsidies for beedi workers. Knowledge of this Act coincided with a growing recognition by SEWA Union that a beedi worker's home was not only her principle place of production but potentially her most significant asset.[12] The insecure and low-quality shelter of beedi workers in Ahmedabad was identified as a challenge to income generation. A key concern was the high and frequently changing rents faced by these households.

Therefore, the Union came to believe that a group housing program, which would be eligible for subsidy under the government's Beedi Workers Welfare Fund Act, would lead to low mortgage payments and would imply a significant savings (relative to paying rent). In interviews, Union officeholders state that they considered this the key income generating channel associated with a housing program. Alongside, they believed that having a secure house would enable children to go to school consistently. Finally, the Union's interest in female empowerment led them to emphasize the need for housing

[12] Beedi rollers typically work at home on a piece-rate basis. An agent supplies raw materials and pays women for finished beedis that he then sells to beedi companies. The rate for beedis at the end of 2007 was about one dollar (Rs.40-42) for 1,000 rolled beedis, which requires two half-days of work.

titles to be in the woman's name so a husband would be unable to sell a house without his wife knowing.

As a first step, the Union conducted a survey of its members to identify beedi workers with a monthly household income below Rs.700. This gave them a sample of 497 women primarily representing two caste groups, Koshti (35%) and Padmasali (41%) with the third largest group being Muslim (10%).

They then approached the government's Beedi Workers Welfare Fund, who asked SEWA to work out a group housing scheme. SEWA, noting that 1987 was the Year of Shelter for the Homeless, brought together the Housing and Urban Development Corporation (HUDCO), the Ahmedabad Urban Development Authority (AUDA), the Beedi Workers Welfare Fund and the Gujarat Government's Ministry of Labour. SEWA's website describes their contributions as: "each of them agreed to contribute: HUDCO to provide loans, AUDA to identify a piece of land under the scheme allocating land for the economically weaker sections and to build the houses, the Beedi Workers Welfare Fund to provide subsidies and the Gujarat Government to sponsor the scheme. SEWA said it would mobilize the women beedi workers, and SEWA Bank undertook the responsibility of collecting repayment of the loans."

SEWA Union identified the 497 women sample (described above) as eligible for the lottery, and all women agreed to enter the lottery. The lottery was conducted publicly on International Housing Day in 1987. Slips of paper representing the 497 women were put into a bowl and the second in command at SEWA drew 110 names. These 110 women were given the opportunity to purchase houses in the newly constructed area we refer to as Colony A.

The Union worked with the Ahmedabad Urban Development Authority to identify land, construct homes, and secure housing loans. The largest hurdle turned out to be finding suitable land on which to build the development. Ultimately, the houses were

built on vacant government land situated on the periphery of the city, near the new (at the time) international airport, which was further away from the city center than the initial location that was targeted for development. The units are single-story row-houses of approximately 200 square feet, sharing a wall with next door houses, and a narrow alley between rows that are built back-to-back. The area has an open public space where a temple was also constructed.

Importantly, as is true with much public housing, units in Colony A were ultimately provided to winners at a substantial subsidy. The construction cost of the new homes was Rs.24,800. Winners of the lottery paid Rs.900 as a down payment and were given 20-year housing loans, guaranteed by the Union. Those who took up the loan were required to repay Rs.124 (about US $2.75) in monthly installments for a nominal total of Rs.29,760. Under relatively conservative assumptions, winners received a subsidy of around 30% of the value of the property when they received the house at the end of 1993. The houses are currently valued at Rs.60,000 – Rs.70,000, or approximately US $1,330 – $1,550, which is almost entirely accounted for by changes in nominal prices over the period.[13]

Winners of the lottery did not receive titles to their homes; instead they received an "allotment letter," which is converted to a title only after all mortgages have been repaid. These allotment letters (and the future titles) were given in the beedi worker's name. Those who accepted the loan were not allowed to rent or sell the property until the title had been transferred to them from the bank (although family members could occupy the residence), hence they were expected to maintain the residence for 20 years.

[13] Rs.60,000 in 2007 Rs. is approximately equal to Rs.24,800 in 1993 Rs. according to the national CPI.

3.4 Constructing the Dataset

3.4.1 Sample

A key issue in constructing and analyzing the dataset of lottery participants is the fact that a hard copy of the list of the 497 women who entered the lottery in 1987 has not survived. Therefore, a first step of the dataset construction was identifying the participants. We were able to identify up to 463 of the participants. Below, we describe the procedure followed and in Section 4 we describe how our analysis controls for potential biases in who was not identified. The first source of names is the official and complete list of lottery winners, which includes participant name and address in Colony A. We refer to this as the "winners list." The 387 non-winners of the original lottery were invited to pay Rs.250 and participate in a second housing draw. Due to operational challenges, SEWA Union decided not to pursue a second lottery in the end, but they kept the list of 297 non-winning women who had decided to enter and were able to supply us with it. This list consisted of name, age, and, for some women, an address at the time of the lottery. We call this the "non-winners list."

Our third source is a partial listing of the participants (literally, two pages of the full list), which survived in the home of a former employee. This subset lists 109 women, both winners and non-winners among them. Out of 109 names, 83 were already named on either the winners list or the non-winners list, therefore it provided us with the names of an additional 26 women who lost the original lottery. In addition to giving us more names, this Participant Subset list also provides some baseline characteristics (address, marital status, husband's occupation in 1987 and participant, husband and household income).

Our fourth source of names is referrals from women who were in the lottery. In our tracking survey we have located additional non-winners by asking for names of friends

and relatives who also participated. Participants named 91 women, of which 30 are new names not covered on our other lists. This list is called the Referrals. It is possible that participants believe getting on our list will allow the referrals to participate in another housing program, or the second draw that never happened, despite our surveyors insistence otherwise. Since we are unable to verify that referred women participated in the original lottery, our analysis will control for verifiability.

After constructing the participant list we also had to track these participants, many of whom had moved from their original address. If a participant did not live at the original address then we asked neighbors. In addition, we searched for participants' names on recent SEWA Union membership rolls and in SEWA Bank client records. Several women who work for different branches of SEWA — the Union, the Bank, and the Insurance group, also helped us identify participants. The main organizers of the lottery in 1987 scrutinized lists for names they knew. We also read out a list of unfound participants at a Union meeting in April 2007. In addition to SEWA, we used other beedi networks to locate participants and talked to important beedi agents in areas where many beedi workers lived in 1987. Finally, we looked for names of the unfound women on the 2004 Ahmedabad electoral rolls. Appendix Table 1 shows our final tracking status.

Of the 463 named participants, 23 women have moved out of Ahmedabad. We tracked 17 of them as far away as Mumbai, Hyderabad, and Chennai. Another 29 women have died, and we were able to locate children or husband of 25 of them. An additional four women were located but unable to answer the survey due to incapacity, and their families were surveyed in their place. We were unable to track a final address for 10 women. Overall we surveyed 443 participants (or their family member in case of death or mental illness). Our final response rates are 89% of the original 497 participants and 96% of the 463 participants who could be named. No one refused the survey.

The biggest concern with our participant procedure is differential attrition among

winners and non-winners. For instance, it may be that the richest non-winners chose not to enter the second lottery and therefore the non-winner list consists of the poorest non-winners. Alternatively, it may be that the poorest and least informed non-winners were less likely to know about and enter the second lottery. In ongoing work, we check the robustness of our results using the random participant sample.

3.4.2 Survey

Our main survey was conducted between May and October 2007 and focused on obtaining a full mobility, housing and employment history for the participant and her immediate family (husband and children). We have additional modules on children's education, health, and the use of financial products. We also collected information on collective action, social networks, immediate neighbors, and beedi rolling. Finally, we obtained information on major shocks faced by the household and their coping mechanisms. Between February and April 2008 we revisited respondents to get additional information on the places they lived in 1987 and mapped them using handheld GPS devices.

3.5 Checking Balance of the Final Sample

Given that our participant sample differs from the original participant sample we report multiple randomization checks in Table 1. Specifically, we examine whether outcome variables in 1987 varied across winners and non-winners in different samples.

In Panel A we start with the analysis sample, which covers the 443 identified and located participants. We observe a slight imbalance in Muslims, with Muslims being over-represented in the non-winner category by 6.5 percentage points. In this panel, we also report a randomization check for surveyed participants using data from the survey pertaining to individual and household-level characteristics before the housing lottery took place. There are no significant differences between the means for winners and non-winners

in any of the other 25 variables tested in Panel A.

Panel B examines the 463 identified participants. We tracked a similar fraction of winners and non-winners despite having a list of all of the winners but not the non-winners from the start. This indicates that our multi-stage process of naming non-winners did not make them easier or harder to locate than winners.

Next, in Panel C we consider a random subsample of the original participant list: the Participant Subset. The results indicate that we observe no significant differences between winners and non-winners in this group for 1987 marital status, income, distance to the centers of the city, or husbands' occupation.

Additional regressions (Appendix Table 2) indicate that while our surveyors were better able to find respondents who were named, which all winners were due to SEWA keeping a list of winners, this is not correlated with the dates that the other lists were made.

Thus, overall the main imbalance we see is by religion — to check that this does not reflect corruption (where Muslims were systematically prevented from winning) we estimate regressions which examine the perceived fairness of the lottery process. In Appendix Table 3, column (1) the outcome is respondent perception of whether the lottery was conducted fairly. Unsurprisingly, winners are more likely to perceive the lottery as having been fair, but we do not observe any difference across Hindu and Muslim participants. In column (2) we examine if there are differences by religion based on whether participants state having won the lottery — again, we see that the main predictor is having won the lottery according to the SEWA list and there is no difference by religion. That said, throughout the paper we present both the experimental estimates and estimates where we control for tracking procedure and religion/ethnicity of participant.

4 Results

We now turn to an evaluation of the impact of winning a house in Colony A on slum-dwellers' locations and long-run outcomes associated with moving to the more remote location. Since the lottery led to random allocation of housing to winners, we can interpret the Intent to Treat (ITT) estimates as capturing the causal impact of receiving the housing opportunity. To obtain the ITT estimates we estimate:

$$Y_i = \alpha + \beta_1 winner_i + X_i + \epsilon_i \tag{1}$$

Throughout, we report estimates with and without a set of controls. Our set of controls responds to the fact that our sample is imbalanced on religion, and so we include controls for ethnic identity (using indicators for whether the household is Muslim, Koshti caste, or another caste, omitting Padmasali caste). We also include indicator variables for participants whose name was referred by another member (rather than on a list from the Union), and a binary equal to one if a family member responded to the survey because the lottery participant has died or is unable to answer due to mental illness. This vector of covariates is denoted by X_i.

In Section 4.1 we start by examining how winning the lottery in 1987 influenced a participant's decision to relocate, and consequent housing history. In Section 4.2 we examine the impacts of winning on respondent income and occupation and their children's educational and marriage outcomes. Finally, Section 4.3 examines impacts on social interaction and cooperation.

4.1 Location and Housing Characteristics

In Table 2 we explore the implications of winning the housing lottery on housing outcomes. We first examine relocation (Panel A) and then the impact of winning on current housing

outcomes (Panel B). Finally, since mobility, in general, is high for our participant pool our survey collected detailed data on each residential location between 1987 (when they entered the lottery) and 2007. The data included the number of years spent in that house and housing history between entering the lottery in 1987 and completing the survey in 2007. In Panel C we report outcomes that are a weighted average of the outcome in each of the locations in which the participant resided between 1987 and 2007.

As described in Section 3.3, the opportunity to take out a mortgage for a home in Colony A represented a significant financial opportunity, given that SEWA offered units at a subsidy of at least 30%. Hence, not taking up the loan when given the opportunity entails leaving a substantial amount of money on the table. Nearly all of the winners accepted the mortgage and the allocation letter. However, relocating to Colony A among those who took the mortgage was far from complete. The first row of Panel A shows immediately that only 67% of winners report having *ever* lived in Colony A.[14] Among those who moved, the average amount of time spent in Colony A was just over 6.5 years. In Panel B we see that fourteen years after residents moved into the property, roughly 34% of winners still live there. Figure 1 plots the distribution of years spent in Colony A for the sample of winners. Here we observe that, although the majority of movers report that they eventually move out and sell or rent the property on the informal market (prior to loan repayment), approximately 60% of participants who moved in stayed on the property for at least 10 years, and 85% stayed at least five years. Hence, it is reasonable to anticipate significant relocation impacts on at least 85% of the movers, or roughly half of the winners.

As expected, regression results in Panel B indicate that current housing of winners is higher than average quality (as measured by the durable construction index), but also significantly more remote than the average non-winner's residence. On average,

[14] See Appendix Table 4 for the results of a regression estimating relocation of the winners on the Participant Subset list using baseline income, marital status, and husband occupation.

winners reside an additional mile away from the city center. In Panel C we see that winners report a higher average distance to the nearest hospital (averaged across all residential locations from 1987-2007), although there is no evident difference in access to public schools, presumably because there is a reasonably well-distributed supply of schools throughout the city. Winners' sons also live further from the city-center (Panel B), though the point estimates suggest that this difference is smaller (we explore this further when examining children's outcomes). A visual representation of these spatial differences in location is provided in Figures 2 and 3 which map winner and non-winner housing in 1987 and 2007.

In terms of neighborhood composition, we do not observe any significant difference in housing density. In 2011 we worked with a real estate agent to evaluate house prices in neighborhoods where winners and non-winners currently reside. Due to capacity constraints, the agent was not able to value all 443 houses. In order to maximize the number of houses valued, we selected the five most popular neighborhoods and had the real estate agent estimate a value for all participants' homes within these areas. This yielded 109 homes, or 28% of non-winners and 34% of winners due to the concentration in Colony A. As we see in Panel B there are no systematic differences in housing prices in neighborhoods where winners reside relative to where non-winners reside. Consistent with this, in Panel C we see no reported difference in the safety of neighborhoods in which winners and non-winners have resided over the past several years. Thus, it appears that twenty years later non-winners live in neighborhoods that had similar levels of average wealth as winners, but (based on the durable construction index) are among the poorer residents of these neighborhoods. The fact that non-winners live in worse housing but not in systematically poorer neighborhoods at baseline suggests that we should anticipate only limited neighborhood effects (unlike those observed in studies such as MTO, which involve subjects relocating from very poor to relatively wealthy neighborhoods).

It is also somewhat surprising that we observe little difference in housing investment between winners and non-winners, which may reflect a combination of greater need for housing improvements among non-winners, but greater incentive to invest among winners due to greater ownership rights. In particular, in Panel B we also see that winners enjoy greater opportunity for home ownership. While rates of home ownership are relatively high in this population - 70% of the non-winners report owning a house - the percentage of winners reporting owning their own home is 9 percentage points higher. While both winners and non-winners report similar rates of title possession, the housing program made it much more likely that an adult woman (the participant) reports having a title in her name. This effect is strongly significant even when we restrict the sample to winners and compare respondents who moved to Colony A to those who did not (not shown here). Thus, winning and moving to Colony A made it significantly more likely that a woman had the title for a house in her name twenty years later. However, we do not see this translate into greater decision-making power for women (Panel B).

These results imply that even among a subset of individuals who had fought hard to bring about the new housing opportunity, the indirect costs of moving from slum housing in the city center to Colony A were incredibly large for the 33% of winners who never relocated. Given that these were all individuals who had chosen to participate in the mortgage lottery when the only unknown feature was location, we can presume that the individuals who opt out do so because the difference between the final and anticipated location greatly changed the private value of the housing program.

A natural question that arises from this finding is: What aspect of the housing location makes it so much less valuable to potential residents? That is, why are so many individuals who are looking to purchase a home outside of their current slum location and who desire to move into housing with fellow beedi-makers unwilling to move even when offered a chance to purchase an asset, which can be formally transferred in 20 years, at a significant

subsidy? Although housing may be considered a risky asset, the implied return on such an investment is large enough to swamp any reasonable change in housing values over the period. Hence, it appears that the location of the property and implicit requirement that the household reside in that location for twenty years was associated with significant costs.

To investigate the nature of these costs, in the following tables we examine the causal effect of opportunity to relocate on various measures of household well-being.

4.2 Economic Well-Being

Table 3 reports the program's effect on household composition and demographic outcomes. In general, we see no measurable differences across winners and non-winners in key household characteristics that have the potential to be influenced by housing location, including fertility, current health status, and labor force participation.[15] On average, both winners and non-winners report living close to two sons and two daughters, and the vast majority of participants and their husbands are currently employed.

The only notable differences in living patterns are that winners are significantly less likely to live with their sons, and correspondingly live in weakly smaller households. This pattern is consistent with results from the previous table on neighborhood geographic isolation: the greater distance to employment opportunities is likely to discourage extended family members from cohabitation.

Table 4 reports traditional measures of economic well-being. Overall, in all, we observe strikingly few differences between lottery winners and non-winners in terms of economic outcomes 14 years after obtaining possession of Colony A housing. Total and individual household members' incomes are virtually identical across treatment groups, and there

[15] Appendix Table 5 tests individual measures of current health of the participant, her husband, and her children, and demonstrates no important and significant differences between winners and non-winners.

are no visible differences in patterns of consumption, savings, or borrowing.

Additionally, work histories of participants do not appear to be affected by the financial incentive to relocate in terms of rates of unemployment or work hours over the 14-year period. While the absence of employment effects on participants may result from the fact that they are primarily home-based workers, the absence of employment effects on husbands is more surprising given the documented change in distance from the city center. The only significant difference in labor force participation is the likelihood that a participant holds a second job, which is 4% among non-winners and only 1% among winners. This is once again consistent with the other pieces of evidence that winners are more isolated from work opportunities, however it is worth noting that the differences are small in magnitude and only marginally significant. Consistent with this interpretation, we also observe weak evidence that husbands are significantly more likely to commute to work: 93% of winners and only 85% of non-winners report having husbands who work outside the home, conditional on currently working.[16]

As reported in Table 5, adult children also appear to benefit little from the housing lottery. In these regressions, where applicable, we look separately at the program effect on sons and daughters by including dummies for treatment and gender of child, along with the interaction between treatment and gender. In this table, column (2) presents the estimate of the program effect on sons, and the sum of columns (2) and (3) gives the program effect on daughters (column 4). Throughout, we cluster standard errors at the household level. Columns (5) through (7) repeat the analysis with covariates.

Overall, adult children of winners and non-winners look very similar in terms of schooling, marriage and employment outcomes. While sons appear to be slightly more likely to marry within caste, the result is not robust to the inclusion of basic controls, and the mean of the variable is so high (0.99) that differences are not particularly informative.

[16] Approximately 18% of husbands have retired, and this rate is the same for husbands of winners and non-winners.

The only child outcome that appears to be significantly and robustly different across treatment groups is the frequency with which participants interact with their adult children, with winners reporting less frequent contact with daughters and living further away from their adult sons. Given that daughters of winners and non-winners are equally likely to be married, this suggests that winners' daughters are relocating to more central parts of the city for school or marriage. In sum, isolation appears to be the major impact of the program on households.

4.3 Impact on Social Interactions and Cooperation

Taken together, the findings from Tables 2 through 5 suggest that, 14 years after entering the lottery for the housing program, the demographic and economic well-being of winning and losing households are roughly the same. The one difference that emerges across the various dimensions of well-being is differences in isolation. Winners live further from the city center, are less likely to have adult children living with them and see their daughters less frequently.

Given the apparent impact on degree of isolation, we now examine whether relocation also influenced the social and risk-sharing networks of winning households.

Our survey asked respondents about each of the households who live in the four houses near them (across, behind, left and right) and how often they socialize through conversation, drinking tea together, or sharing a meal. The average respondent has 2.7 immediate neighbors, and this number does not vary with the lottery outcome of the household. We use all responses to construct a pair-level dataset in which the unit of observation is at the respondent-neighbor level and cluster standard errors at the respondent level. The results are in Panel A of Table 6. Overall, respondents' interaction with immediate neighbors is high, and significantly greater for those encouraged to relocate: 95% of pairs have ever socialized and this number is 3 percentage points higher for winners. This is particu-

larly surprising given that winners are significantly less likely to have neighbors from the same caste, and suggests substitution of neighborhood caste networks for occupational networks. The probability of living next to a beedi worker is 12 percentage points higher for winners. In light of the previous findings on geographic isolation, the shift in network composition likely reflects the difficulty of maintaining within-caste ties when geographic distance increases.

In Panel B we examine whether winning the lottery changed a beedi worker's broader social network. We measure this in three ways. First, we examine whether the respondent has someone she can talk to about personal affairs, work and with whom she can spend leisure time. The first three rows of Panel B show that 84% of the respondents state having access to such a network member and 77% state that the person lives in their neighborhood. Winners are more likely to report that the person they socialize with is a neighbor. Thus, it is clear that households rely on very local networks.

Next, in Panel C we examine the risk-sharing (or borrowing and lending) networks of households. We start by studying whether the household has individuals it can rely on for borrowing or lending. We make use of four questions in which the (living) respondent was asked from whom she borrows or lends items and details about this person.[17] We first check if there is anyone the respondent can borrow from or lend to for any of the questions where the dependent variable is an equally weighted average for the four outcomes. On average, 88% of the non-winners have access to such a network, and this number is 7 percentage points lower for winners. Winners and non-winners are as likely to draw this person form the same neighborhood (84%) and same caste (62%). However, winners have known the people who they share risks with for roughly three years less.

[17] The four questions are: Who is the person you trust enough to lend Rs.50 for 24 hours? Who is the person you would ask to borrow Rs.50 from for 24 hours? Who is the person you would go to if you needed to borrow kerosene or rice for one day? In case of a health emergency, whom would you go to for borrowing Rs. 500? Appendix Table 6 presents regressions estimating these borrowing and lending outcomes individually.

Finally, in Panel D we examine the impact of changing networks. To do so, we make use of the fact that the city of Ahmedabad experienced several citywide shocks in the six years preceding our survey. These included an earthquake in 2001, communal riots in 2002 and both floods and a viral epidemic (called Chikangunya) in 2006. We start by examining whether the respondent household was exposed to any of these shocks. Over 90% of households report experiencing at least one shock, with the average household experiencing 2.76 shocks. These shocks were costly for households, as measured by days of work lost. In general, we observe relatively limited risk sharing in response to these shocks (likely reflecting the aggregate nature of these shocks). Lottery winners essentially report receiving no help after a shock, and non-winners received help for 2% of the shocks. While the difference is significant, they are both extremely low values. This is, however, consistent with the above evidence from hypothetical questions about availability of informal insurance. Thus, it would appear that in both real and hypothetical scenarios, winners report less ability to rely on friends and family for help in the event of shocks.

Survey data on current participation in the bidi workers union that all respondents belonged to at the time of the lottery provides another check on network connectedness (Panel E). Twenty years later we see that 87% of respondents still belong to the Union, and that this number is similar across lottery winners and non-winners consistent with their continued work activities. However, while roughly 58% of non-winners report having attended any Union meeting over the last year, this number is 26 percentage points lower among winners. This pattern provides further evidence that due to geographic isolation, lottery winners invested less in maintaining social ties with the broader community of bidi workers, and substituted towards more local ties that were less costly to maintain. Unfortunately, due to the high degree of spatial correlation in the major economic shocks such as floods, earthquakes and riots, these more localized networks were also less valuable in terms of providing informal insurance.

In Table 7 we consider collective action in the neighborhood. Each respondent was asked about her participation in activities to benefit the community over the last three years.[18] Roughly 19% of non-winners report having engaged in such activities over the last three years. Strikingly, this percentage is doubled among winners. Next we ask the respondent to consider the most recent project she worked on and answer a series of questions on it. Here we restrict the sample to respondents who reported participating. It appears that collective action was not affected on the intensive margin – conditional on working on a project winners and non-winners spent roughly the same amount of time and money.

While there are many potential interpretations for this pattern, one possibility is that more isolated, localized networks are better able to coordinate around public goods provision for the same reason that they are bad at providing informal insurance: localized networks entail a higher degree of correlation in the benefits of and hence preferences over public goods such as infrastructure.

5 Qualitative Evidence

In the fall of 2011 we interviewed a sample of winners and non-winners. We classified participants in four strata: whether the participant lost the lottery, won the lottery but did not move to Colony A, won and initially moved to Colony A but then left, and won and still lives in Colony A. Within each group we randomly selected respondents. We spoke with 21 lottery participants, yielding interviews with five non-winners, four winners who never moved, six winners who moved into Colony A and later moved out and six winners who moved into Colony A and are still there. The interviews were recorded and then transcribed.

[18] The specific question asked was, "What activities or problems have you worked on with your neighbors to benefit the community in the past three years?" Appendix Table 7 lists the number and types of activities undertaken.

Our interviews were semi-structured and probed respondents on two main themes: their housing status and its implications for both their economic and subjective well-being, and their networks. In this section, we summarize the salient findings from these interviews. Our aim is to use these interviews to generate plausible hypotheses for two key findings from our quantitative analysis: the limited change in the economic well-being of winners (relative to non-winners) and the low levels of take-up of Colony A housing (both initially and in the long run).

5.1 Value of Home Ownership

In general, winners concurred that the opportunity to move to Colony A gave them tenurial security and permanence that was devoid from rental housing. As one winner described,

"[Owning my house] is very important. Now that we won this house it is very good. Otherwise, if we didn't get this house then we would have had to live on rent and then the landlord could say at any time leave the house. Every year we might have had to change house."

For some winners this tenurial security translated into greater subjective well-being. *"We feel proud that we own our house. We are more confident, this is our own house, and no one can cause any problem."* Most winners identified home ownership as a financially liberating opportunity to save on rental expenses. Winners recognized and appreciated the opportunity for asset creation afforded by their new living situation.

"I liked that I owned my house and that I didn't have to pay rent. I liked that after paying monthly installments for some years this house would become my own. I was [previously] paying Rs.500 as rent in Hatkeshwar but now I only pay Rs.124 as a monthly installment." Another winner stated *"I feel like I have a property worth 3 to 4 lakhs so in the future if I need the money I can sell it...My two sons are now older and they will*

get married. At that time I will have to sell this house and buy a bigger house for all of us."

The importance of home ownership was also felt by the non-winners, many of whom owned a house by the time of the interviews. *"It feels good to own a house — to have your own house. If we were renting then we would have had to pay rent and at any time the landlord could tell us to leave."*

5.2 Costs of Isolation

While appreciating the benefits of home ownership, many winners emphasized the relative isolation of Colony A. Many early residents described Colony A as "wild" and "jungle-like." While most men of Colony A looked for jobs nearby, there simply were not enough — or any — to be had. For many of the families who ultimately left, the men had continued to commute long distances to jobs in their old neighborhoods. This was both tiring and costly for families. One woman described the commute as, *"[My husband] was working at a public distribution system shop that was in Rakhial. He continued working there, in the same shop, even after we moved to Colony A. He used to ride his bicycle to work — it would take him 1 hour to get there. The commute was very difficult for him .... Sometimes he would fall sick from exhaustion. The children were always getting sick. It was too tiring."* Similarly, women typically stated that their earnings were unchanged after moving to Colony A. As beedi rates are uniform across the city, the main constraint of beedi workers was their physical ability to roll more beedis. The move to Colony A did not affect their physical ability to produce more cigarettes. As a result beedi workers did not find their incomes changed by the move to higher quality housing. The lack of low-skilled local jobs for husbands and children meant that some respondents reported declines in family income. Lottery winners also noted the impact of isolation for their children. In the initial years of its development, Colony A was poorly connected by public transport.

Residents endured journeys that were costly and time-consuming. As one winner who left Colony A described *"[In our old neighborhood] Rakhial — schools, markets were all much closer. In Colony A everything was far away — dropping the children to school took half an hour. The school was in Nobal Nagar, some two kilometers away."* Other winners stated that rental savings that living in Colony A afforded winners was spent on transportation costs. In the quantitative analysis, we saw that winners live further from health facilities. One participant described how these additional health costs caused them to move out from Colony A. *"My son got sick and had a very high fever which reached his brain. There were no medical facilities or proper doctors in Colony A who could help him. So, we decided to move to Bapunagar. Since then we have not been living in Colony A."*

Due to the long distances that their husbands traveled for work many respondents who subsequently moved out reported feeling "scared" and "lonely" — especially as their husbands worked long hours in the City. The sense of loneliness was heightened by the fact that after moving to Colony A some residents found themselves living far from their families, and subsequently felt socially cut off from their community (caste) and family. *"When we were living in Colony A we were thinking that we were so cut off from everyone no one was inviting us to any functions."* Colony A's remote location and the low prevalence of mobile phones in the 1990s meant that many winners were virtually cut off from their families and fellow caste members. Without this network, many residents found themselves lonely and confined to neighbors of different castes and sub-castes. According to one winner *"The whole area was deserted and lonely — someone could die there and no one would even know that you had died."* In contrast, non-winners stated that their main network remains caste-based. *"There is a sense of community here — but it is along caste lines. People from our caste help us, but not others."*

Some winners were also deterred by "new" residents who moved into Colony A and

the adjacent areas that were being developed. These new residents lacked both caste and occupational bonds with the original lottery winners. Many described the degradation of Colony A with the advent of 'bad' people. *"As people started to move into the area around Colony A the area began to get dirty, filled with bad people...The area around Colony A was not good — people were drinking and gambling. Alcohol and prostitution was going on in the chali across from Colony A."*

The Colony A program was designed with the assumption that poor slum dwellers placed very high value on tenurial security and that credit constraints limited home ownership in this population. The interviews support this — participants emphasize both the economic benefits of (subsidized) homeownership and the greater subjective well-being associated with homeownership. But the primary lesson that emerges from these interviews is the high costs of isolation for the urban poor, and that these costs may be particularly high for the more credit-constrained in this group. In the long run, many households responded to these high costs by moving out of Colony A. As a result, the survey data shows relatively muted long run differences in travel expenses. We also observe few impacts on children's long-run outcomes, suggesting that households managed to circumvent the costs of isolation for children — very likely, by moving. But what this meant is that the wealth (income) effect of the housing subsidy turned out to be relatively transitory. The interview results, thus, lead us to hypothesize that a critical deficit in many slum relocation programs is their piecemeal nature — they provide tenurial security but fail to enable relocation of jobs and opportunities for children.

6 Conclusion

This paper demonstrates the importance of location on the structure of networks for the urban poor and, in turn, the consequences of geographic isolation on informal cooper-

ative arrangements. As networks become localized, investment in neighborhood public goods improves. The downside is that by relying more on others who live nearby, the ability to co-insure against large, spatially correlated shocks declines. This highlights the importance of changes in networks potentially brought on by internal migration, urbanization, and housing relocation programs designed to improve living conditions for the urban poor. We have identified five key findings from this study that may be of particular interest to policymakers. First, we observed high rates of departure from the colony within 10 years. This shows the importance of going beyond short-term process evaluation; in terms of mortgage take-up, the program would have looked very successful at the outset, since there was close to 100% compliance. A significant part of this departure occurred after just five years, pointing to the importance of long-run tracking for long-run studies. Second, the combination of experimental and qualitative evidence gives potential reasons for these departures. A common complaint from respondents was the challenge of maintaining livelihoods while facing commuting costs (financial and time). This suggests that addressing transportation will be important to future housing programs, and that they should consider the employment locations or ability to change jobs of all working members of the household. Third, like many other studies, we found networks to be important because they provide social insurance and help smooth consumption. Social network maintenance is costly, and concentrating investments in geographically close contacts can reduce costs. The downside is increased correlation of spatial risks within networks. Fourth, over the long term, non-winner households were also able to achieve a high rate of homeownership, though it was still below that of winners. Economic outcomes, childrens outcomes, and health are the same between groups in the long-term. Taken together, our third and fourth findings suggest that sustainable home improvement programs need to address workers housing insecurity in ways that do not require them to face relocation. One such solution is to build rental towers on small plots in central loca-

tions and provide formal leases; another is to provide rental guarantees or down payments, often equal to 10 months rent, for leases on privately available property. If relocation is deemed necessary, then households need to be compensated for the above identified costs. Finally, further research is required to disentangle the impact on home-based workers of improved housing infrastructure from the effects of location and income. One approach may be to experimentally compare the relative impacts of relocation and in-situ upgrades against a control group over a set period of time.

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Table 1. Randomization Checks

Panel A Participants Found & Surveyed in 2007	Non-Winner mean	Winner mean	Difference	Winner n	Winner n
Demographics					
Age in 2007	45.13	45.05	-0.08	338	105
	[14.86]	[16.76]	(1.71)		
Participant died or is mentally incapacitated	0.05	0.07	0.01	338	105
	[0.22]	[0.251]	(0.03)		
Muslim	0.12	0.05	-0.07**	338	105
	[0.32]	[0.21]	(0.03)		
Padmasali	0.39	0.47	0.07	338	105
	[0.49]	[0.50]	(0.06)		
Koshti	0.37	0.32	-0.04	338	105
	[0.48]	[0.47]	(0.05)		
Other Hindu Castes	0.12	0.16	0.04	338	105
	[0.33]	[0.37]	(0.04)		
Never married	0.01	0.02	0.01	338	105
	[0.11]	[0.14]	(0.01)		
Divorced/Separated by 1987	0.02	0.03	0.01	333	102
	[0.13]	[0.17]	(0.02)		
Widow 1987	0.06	0.09	0.03	338	105
	[0.24]	[0.28]	(0.03)		
Number childen born before 1987	2.62	2.62	0.00	338	105
	[2.13]	[2.23]	(0.24)		
Location in 1987					
Distance to center of city from house (miles)	2.28	2.32	0.05	337	105
	[0.94]	-[1.07]	(0.11)		
Distance to SEWA Union headquarters (miles)	2.77	2.84	0.07	337	105
	[0.96]	-[1.15]	(0.11)		
Minutes walk to nearest govt. school from house	16.99	15.01	-1.98	327	100
	[13.92]	[9.76]	(1.49)		
Minutes walk to nearest govt. hospital from house	32.17	29.93	-2.24	327	100
	[21.19]	[19.65]	(2.38)		
Woman could not walk safely alone after 10 PM	0.13	0.11	-0.02	322	101
	[0.33]	[0.31]	(0.04)		
Household Amenities in 1987					
House had a water tap	0.87	0.82	-0.05	326	100
	[0.34]	[0.39]	(0.04)		
House had a toilet	0.55	0.51	-0.05	327	99
	[0.50]	[0.50]	(0.06)		
House had a separate kitchen	0.44	0.43	-0.01	327	99
	[0.50]	[0.50]	(0.06)		
Education in 1987					
Schooling costs per month	183.90	224.32	40.42	338	105
	[338.54]	[488.60]	(42.38)		

Note: Standard errors of differences in parentheses; standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 1. Randomization Checks *continued*

Panel A Participants Found *Continued*	**Non-Winner mean**	**Winner mean**	**Difference**	**Non-Winner n**	**Winner n**
Occupation 1987					
Husband had a mill or factory job	0.35	0.45	0.10	266	74
	[0.48]	[0.50]	(0.06)		
Time husband spent going to work	3.20	2.89	-0.31	292	83
	[10.36]	[9.91]	(1.28)		
Money husband spent going to work	0.41	0.24	-0.17	292	83
	[3.93]	[1.54]	(0.44)		
Choice of 1987 location					
Chose location to be near family/ friends	0.76	0.75	-0.01	327	105
	[0.43]	[0.43]	(0.05)		
Chose location for resources	0.13	0.11	-0.01	327	105
	[0.34]	[0.32]	(0.04)		
Chose location for price	0.03	0.04	0.00	327	105
	[0.18]	[0.19]	(0.02)		
Chose location for other reasons	0.08	0.05	-0.03	327	105
	[0.27]	[0.21]	(0.03)		
Panel B Participants Named	**Non-Winner mean**	**Winner mean**	**Difference**	**Non-Winner n**	**Winner n**
Muslim	0.11	0.05	-0.07**	353	110
	[0.31]	[0.21]	(0.03)		
Padmasali	0.39	0.46	0.07	353	110
	[0.49]	[0.50]	(0.05)		
Koshti	0.37	0.31	-0.06	353	110
	[0.48]	[0.46]	(0.05)		
Other Hindu Castes	0.13	0.18	0.05	353	110
	[0.33]	[0.39]	(0.04)		
Found/ Surveyed	0.96	0.95	0.00	353	110
	[0.20]	[0.21]	(0.02)		
Panel C Participant Subset (data collected 1987)	**Non-Winner mean**	**Winner mean**	**Difference**	**Non-Winner n**	**Winner n**
Married	0.80	0.86	0.06	65	44
	[0.40]	[0.35]	(0.07)		
Widow	0.11	0.07	-0.04	65	44
	[0.31]	[0.25]	(0.06)		
Participant's Income	268.15	252.50	-15.65	65	44
	[108.28]	[96.16]	(19.75)		
Distance from center of Old City (miles)	2.49	2.55	0.06	57	40
	[0.73]	[0.83]	(0.16)		
Distance from SEWA Union Office (miles)	3.13	3.19	0.06	57	40
	[0.73]	[0.85]	(0.17)		
Husband's Income	374.66	395.85	21.20	58	41
	[176.94]	[186.14]	(37.19)		
Husband Worked in Mill or Factory	0.43	0.54	0.11	58	41
	[0.50]	[0.50]	(0.10)		
Husband Worked as Tailor	0.22	0.12	-0.10	58	41
	[0.42]	[0.33]	(0.08)		

Note: Standard errors of differences in parentheses; standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 2. Location and housing quality

	Outcome Variable	Mean for Non-Winner	Coefficient on Winner		N
			no controls	controls	
Panel A: Colony A Housing History	Respondent's family ever lived in Colony A	0.06	0.61***	0.61***	443
		[0.24]	(0.05)	(0.05)	
	Years lived in Colony A	0.36	6.25***	6.29***	441
		[1.89]	(0.62)	(0.61)	
Panel B: Current Housing (or house lived in when died)	Respondent's Family Lives in Colony A	0.06	0.28***	0.28***	443
		[0.24]	(0.05)	(0.05)	
	Lives in same house as before lottery	0.29	-0.07	-0.05	443
		[0.45]	(0.05)	(0.05)	
	Owns house	0.70	0.09*	0.10**	443
		[0.46]	(0.05)	(0.05)	
	Have a title for the house	0.63	0.08	0.08	443
		[0.48]	(0.05)	(0.05)	
	Title is in the respondent's name	0.23	0.32***	0.32***	437
		[0.42]	(0.06)	(0.06)	
	Respondent's decision making control	0.49	0.00	-0.02	414
		[0.41]	(0.05)	(0.05)	
	Durable Construction Index	0.55	0.12***	0.12***	442
		[0.20]	(0.02)	(0.02)	
	Miles from house to center of Old City	2.88	1.09***	1.08***	423
		[1.31]	(0.19)	(0.19)	
	Miles from son's house to center of Old City	2.76	0.96***	0.93***	701
		[1.20]	(0.20)	(0.21)	
	Miles from daughter's house to center of Old City	2.82	0.53***	0.56***	577
		[1.19]	(0.19)	(0.19)	
	Number of houses in neighborhood	114.98	-24.84	-25.96	406
		[170.55]	(15.31)	(15.94)	
	Mid price of houses in area according to real estate agent (Rs.)	591,686.00	119,727.00	192,644.28	109
		[633,214.80]	(156,137.76)	(154,104.63)	
Panel C: Housing History (1987-2007)	Years owned a house	13.08	1.70**	2.31***	443
		[8.22]	(0.74)	(0.73)	
	Amenity Index (weighted by time in house)	0.46	0.04	0.05	443
		[0.34]	(0.04)	(0.04)	
	Fraction neighborhoods in which woman can walk alone safely up to 11 pm (weighted by time in house)	0.54	-0.05	-0.05	443
		[0.45]	(0.05)	(0.05)	
	Total value of housing improvements made	27937.27	-3,940.13	-2,293.57	443
		[58,509.68]	(4125.77)	(4001.10)	
	Average time to walk to nearest government hospital (weighted by time in house)	32.36	5.78***	6.67***	443
		[19.32]	(2.19)	(2.29)	
	Average time to walk to nearest government school (weighted by years with school children in house)	14.68	0.55	1.13	443
		[11.78]	(1.28)	(1.34)	

1. The set of controls is individual indicator variables for whether participant is Muslim, Koshti caste or other Hindu castes

2. The *Amenities Index* is the average of indicator variables for whether house has (i) a water tap (ii) a separate kitchen (iii) a private toilet. The *Durable Construction Index* averages whether the house has (i) durable walls (brick/cement) (ii) durable roof (tile, cement, concrete) and (iii) durable floor (cement, stone, tile, plaster). *Decision Making Control* is the fraction of six areas (food, clothing, home, health, education, land) the participant exercises control.

3. We report OLS regressions with robust standard errors in parentheses. *Distance to old city from sons' houses* has standard errors clustered at the participant level. Standard deviations in brackets.*** p<0.01, ** p<0.05, * p<0.1

4. The sample for "title in lottery participant's name" and "decision making control" exclude surveys to which a family member responded because the lottery participant has died (n=25) or is seriously incapacitated (n=4).

5. The sample for *Distance to old city from sons'/daughters' houses* is those living in Ahmedabad in 2007.

Table 3. Household composition

Outcome Variable	Non-Winner	Coefficient on Winner: No controls	Coefficient on Winner: Controls	N
Participant is alive	0.95	-0.01	-0.02	443
	[0.22]	(0.03)	(0.03)	
Husband in household	0.79	-0.08	-0.07	437
	[0.41]	(0.05)	(0.05)	
Household size	5.70	-0.48*	-0.32	443
	[2.63]	(0.29)	(0.29)	
Number sons born	1.97	-0.20	-0.12	437
	[1.16]	(0.14)	(0.14)	
Number daughters born	1.73	0.07	0.15	437
	[1.34]	(0.16)	(0.16)	
Number children who have died	0.14	0.07	0.07	437
	[0.51]	(0.07)	(0.07)	
Anyone has a health problem	0.64	-0.03	-0.05	443
	[0.48]	(0.06)	(0.06)	
Participant is currently working	0.87	0.02	0.01	414
	[0.34]	(0.04)	(0.04)	
Husband is currently working (if in household)	0.78	-0.03	-0.02	336
	[0.41]	(0.06)	(0.06)	
Number working sons in household (2007)	1.25	-0.23**	-0.22**	437
	[1.05]	(0.11)	(0.11)	
Number working daughters in household (2007)	0.29	-0.01	-0.02	437
	[0.59]	(0.06)	(0.06)	

Notes:
1. The set of controls is individual indicator variables for whether participant is Muslim, Koshti caste or other Hindu castes (Padmasali caste is omitted), whether participant name came from referral, and whether a family member responded.
2. Health problems: persistent cough, difficulty breathing, cancer, backache, arthritis, vision problem, lung failure
3. The sample for questions about husbands and children excludes 6 lottery participants who were never married.
4. The sample for "participant currently working" excludes deceased and incapacitated participants (whose proportions are balanced between treatment and control).
5. We report OLS regressions with Robust standard errors in parentheses. Standard deviations in brackets.*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4: Economic Wellbeing

	Outcome Variable	Mean for Non-Winner	Coefficient on Winner: No controls	Coefficient on Winner: Controls	N
Income (monthly)	Total household	4244.60	-245.85	-277.74	414
		[2703.17]	(310.24)	(312.14)	
	Participant income	454.56	-52.48	-65.54	414
		[402.60]	(56.12)	(54.56)	
	Husband income	1083.49	-85.57	-72.86	414
		[1336.02]	(151.87)	(155.29)	
	Income from sons	2339.42	-147.14	-178.60	414
		[2474.59]	(260.61)	(264.68)	
	Income from daughters	119.09	58.00	56.85	414
		[383.14]	(51.14)	(48.69)	
	Income from other household members	241.27	-21.76	-14.27	414
		[855.85]	(76.18)	(74.84)	
Consumption (monthly)	Frequently consumed items	1013.81	-19.74	-2.13	414
		[594.08]	(74.94)	(75.91)	
	Infrequently consumed items	864.68	27.43	54.29	414
		[1153.39]	(125.48)	(125.84)	
	Alcohol	43.03	32.97	29.93	412
		[160.14]	(23.97)	(23.74)	
	Ceremonies and religious expenses	35.48	8.49	9.43	414
		[72.72]	(11.37)	(11.29)	
Loans	Total amount borrowed (current loans)	10473.90	3089.64	2955.80	414
		[30681.92]	(3428.67)	(3585.64)	
	Amount saved	4147.87	-1138.76	-1009.12	409
		[25481.22]	(1625.41)	(1609.38)	
Work	Participant currently rolls bidi	0.75	-0.03	-0.03	414
		[0.43]	(0.05)	(0.05)	
	Number years she rolled bidi out of past 20	10.30	-0.72	-0.61	443
		[8.34]	(0.85)	(0.87)	
	Participant has another part-time job	0.04	-0.03**	-0.03*	414
		[0.20]	(0.02)	(0.02)	
	Average work hours per week (weighted by years in job since 1987)	43.27	1.18	1.41	440
		[11.64]	(1.40)	(1.43)	
	Husband - Currently employed in factory/mill (if in household)	0.19	-0.03	-0.04	332
		[0.39]	(0.05)	(0.05)	
	Husband - Number of years since 1987 worked in a factory or mill	4.49	0.21	-0.07	372
		[7.63]	(0.93)	(0.93)	
	Husband - Average work hours per week (weighted by years in job since 1987)	45.51	1.34	2.34	366
		[23.44]	(2.01)	(2.00)	
Commute	Participant's current work is outside the home	0.08	0.02	0.01	361
		[0.27]	(0.04)	(0.04)	
	Husband - Current work is outside the home	0.85	0.08*	0.08*	261
		[0.36]	(0.04)	(0.04)	
	Husband - Number years work was outside out of past 20	14.77	0.13	0.43	380
		[7.48]	(0.78)	(0.80)	
	Husband - Average daily commute time (minutes) over past 20 years if ever commuted	15.79	0.53	-0.14	299
		[13.38]	(2.16)	(2.21)	
	Husband - Average daily commute cost over past 20 years if ever commuted (Rs.)	3.73	-0.08	-0.41	299
		[8.39]	(1.07)	(1.10)	

1. The set of controls is individual indicator variables for whether participant is Muslim, Koshti caste or other Hindu castes (Padmasali caste is omitted), whether participant name came from referral, and whether a family member responded. The alcohol expenditure regression adds a cogariate for "male age 16 or older in the house."

2. Frequently consumed items are: Food, transport excluding commute, movies, pan, cigarettes, bidi, tea outside.

Infrequently consumed items are: Cable TV, DVDs, medicine, repairs, telephones, school fees, clothing.

Commute time and cost regressions include the outcome as 0 and add a covariate for job outside the house without a commute (commonly autorikshaw driver or tailor).

sample for questions about husbands and children excludes 6 lottery participants who were never married. The sample for participant's work

4. We report OLS regressions with Robust standard errors in parentheses. Child currently working clusters standard errors at the participant level. Standard deviations in brackets.*** p<0.01, ** p<0.05, * p<0.1

Table 5. Children of participants

		Mean Non-Winner Sons	Coefficient (without controls)			Coefficient (with controls)			
	Outcome Variable	(1)	Winner (2)	Winner * Daughter (3)	Daughter (4)	Winner (5)	Winner * Daughter (6)	Daughter (7)	**N**
Schooling	Years schooling completed	7.90	-0.34	-1.42	-0.97***	-0.06	-0.87	-0.91***	1,492
		[5.44]	(0.48)	(1.11)	(0.28)	(0.48)	(0.85)	(0.26)	
	Number schools attended	1.62	-0.10	0.03	-0.25***	-0.03	0.02	-0.23***	1,528
		[0.82]	(0.10)	(0.11)	(0.05)	(0.10)	(0.10)	(0.05)	
Marriage	Child married (if over age 16)	0.51	0.07	-0.03	0.22***	0.03	-0.03	0.20***	1,379
		[0.50]	(0.05)	(0.06)	(0.03)	(0.03)	(0.05)	(0.02)	
	Spouse from same house or neighborhood	0.30	-0.04	0.02	-0.02	-0.04	0.02	-0.02	1,378
		[0.46]	(0.04)	(0.05)	(0.02)	(0.04)	(0.05)	(0.02)	
	Marriage was arranged within same caste	0.99	0.01**	-0.03	-0.01	0.00	-0.03	-0.01	1,377
		[0.10]	0.00	(0.02)	(0.01)	0.00	(0.02)	(0.01)	
	Age of marriage (if married)	23.48	0.26	0.61	-4.30***	0.24	0.69	-4.21***	816
		[4.37]	(0.57)	(0.70)	(0.36)	(0.56)	(0.67)	(0.34)	
	Spouse of child years schooling	6.66	-0.64	0.48	0.64*	-0.37	0.15	0.3	770
		[3.85]	(0.63)	(0.67)	(0.35)	(0.52)	(0.34)	(0.57)	
Health	Child currently has bidi-related health problem	0.03	0.02	-0.01	-0.01	0.02	-0.01	-0.01	1530
		[0.18]	(0.02)	(0.02)	(0.01)	(0.02)	(0.03)	(0.01)	
Social	Participant sees this married child at least monthly	0.90	0.06	-0.20***	-0.04	0.07*	-0.21***	-0.05	790
		[0.31]	(0.04)	(0.07)	(0.03)	(0.04)	(0.07)	(0.03)	
	Child lives with participant or in the same neighborhood (if age 16 and over)	0.80	-0.04	-0.04	-0.44***	-0.02	-0.05	-0.43***	1282
		[0.40]	(0.05)	(0.07)	(0.03)	(0.03)	(0.06)	(0.03)	
	Miles between child's house and mother's (if age 16 and over)	0.36	0.26*	0.86***	0.79***	0.25**	0.83***	0.78***	1159
		[1.16]	(0.15)	(0.31)	(0.11)	(0.11)	(0.28)	(0.10)	
Work	Child over age 21 is currently working	0.79	0.03	0.04	-0.21***	0.03	0.05	-0.22***	
		[0.40]	(0.03)	(0.06)	(0.03)	(0.03)	(0.06)	(0.03)	
	Daughter ever rolled bidis	0.69	0.06			0.04			693
		[0.46]	(0.05)			(0.05)			
	Daughter currently rolls bidi	0.36	0.07			0.05			709
		[0.48]	(0.06)			(0.06)			

1. The set of controls is indicator variables for participant is Muslim, Koshti caste or other Hindu castes (Padmasali caste omitted), whether participant name came from referral, and whether a family member responded, and age of child.

2. Sample: 1602 children born to participants. 70 have died. 152 are under age 16 and excluded from questions about marriage. Distance between child and mother excludes children outside Ahmedabad.

3. Bidi-related health problems: persistent cough, difficulty breathing, cancer, backache, arthritis, vision problem, lung failure

4. We report OLS regressions with participant-level clustered standard errors in parentheses. Standard deviations in brackets.*** p<0.01, ** p<0.05, * p<0.1

5. For "sees this married child" the p-value from an f-test with null hypothesis: winner + winner*daughter=0 is 0.01.

Table 6: Social interactions

	Outcome Variable	Mean for Non-Winner	Coefficient on Winner without controls	Coefficient on Winner with controls	N
Panel A: Immediate Neighbors	Number of immediate neighbors reported 2007	2.73	0.09	0.13	443
		[0.95]	(0.11)	(0.11)	
	Neighbor is same caste (same religion if Muslim)	0.34	-0.08**	-0.08**	1220
		[0.47]	(0.04)	(0.04)	
	Someone in their house rolls bidis	0.29	0.12**	0.12***	1210
		[0.45]	(0.05)	(0.05)	
	Ever socialize	0.95	0.03**	0.03**	1209
		[0.21]	(0.01)	(0.01)	
	Socialize daily	0.89	0.01	0.02	1209
		[0.31]	(0.03)	(0.03)	
	Can rely on them in an emergency	0.77	-0.04	-0.05	1199
		[0.42]	(0.04)	(0.04)	
Panel B: Social Interactions	Has someone to talk to or to visit at home (mean of 3 indicator variables)	0.84	0	-0.01	414
		[0.28]	(0.03)	(0.03)	
	If has someone, s/he lives in the same neighborhood	0.77	0.06*	0.07*	386
		[0.33]	(0.04)	(0.04)	
	If has someone, s/he is from same caste	0.63	-0.01	0.02	386
		[0.41]	(0.05)	(0.05)	
	If someone, years known her or him	21.11	-1.97	-1.50	386
		[11.86]	(1.34)	(1.37)	
Panel C: Risk-Sharing	Has someone for lending or borrowing needs (mean of 4 indicators)	0.88	-0.07*	-0.08*	414
		[0.29]	(0.04)	(0.04)	
	If has someone, s/he lives in the same neighborhood	0.84	0.03	0.04	375
		[0.32]	(0.04)	(0.04)	
	If has someone, s/he is from same caste	0.62	-0.02	0	375
		[0.45]	(0.06)	(0.05)	
	If has someone, years known her or him	20.04	-3.25***	-2.89**	374
		[11.72]	(1.24)	(1.27)	
Panel D: Social Insurance	Experienced any big shock (mean of 3 indicator variables)	0.92	-0.01	0	434
		[0.20]	(0.03)	(0.02)	
	Number of shocks experienced	2.76	-0.01	0.01	434
		[0.61]	(0.08)	(0.07)	
	Average days of work lost following shock	29.58	-3.96	-1.95	403
		[22.10]	(2.50)	(2.34)	
	Average number of shocks for which received informal help	0.02	-0.02***	-0.02***	403
		[0.08]	0.00	(0.01)	
	Total value of informal help following shocks (Rs.)	70.77	-70.77**	-79.05**	403
		[500.88]	(28.52)	(32.03)	
Panel E: Union Activity	Participant belongs to Bidi Union	0.87	-0.02	0	414
		[0.34]	(0.04)	(0.042)	
	If belongs, attended any meeting in past year	0.58	-0.26***	-0.24***	357
		[0.50]	(0.06)	(0.06)	

1. The set of controls is individual indicator variables for whether participant is Muslim, Koshti caste or other Hindu castes (Padmasali caste is omitted), and whether participant name came from referral. The person or immediate neighbor "from same caste" outcomes exclude the caste and religion covariates.

2. Sample excludes participants who are dead or incapacitated. For *immediate neighbors*, sample consists of the 4 neighbors living left, right, front, and behind participants. 1220 neighbors reported.

3. "Has Someone" variables are means across a set of dichotomous variables. *Talk to/visit* combines (i) someone to talk to about work (ii) someone to talk to about personal issues, and (iii) someone to visit at home. *Lend/borrow* combines (i) someone to borrow Rs. 50 from (ii) someone you would lend Rs. 50 (iii) someone from whom you can borrow rice or cooking oil, and (iv) someone from whom you could borrow Rs. 500 for a health emergency.

Recent *shocks* asked about are communal riots, earthquake, and outbreak of the chikangunya virus.

Informal sources of help exclude government assistance.

4. We report OLS regressions with robust standard errors in parentheses. For Immediate Neighbor questions, standard errors are clustered at the participant level. Standard deviations in brackets.*** p<0.01, ** p<0.05, * p<0.1

Table 7. Collective Action

Outcome Variable	Mean for Non-Winner	Coefficient on Winner without controls	Coefficient on Winner with controls	N
Neighbors have worked together to solve a common problem in the last three years	0.19 [0.392]	0.19*** (0.05)	0.17*** (0.054)	414
If worked together, days spent in past year on most recent project	8.90 [10.466]	3.30 (3.52)	3.15 (3.3)	95
If worked together, money spent in past year on most recent project	1589.22 [2,154.146]	-142.25 (307.65)	-48.00 (410.4)	91
If worked together, most or all people in the neighborhood contributed money for most recent project	0.91 [0.283]	0.06 (0.05)	0.06 (0.05)	94
Voted in last municipal election	0.94 [0.232]	-0.03 (0.031)	-0.02 (0.03)	412

Notes:

1. The set of controls is individual indicator variables for whether participant is Muslim, Koshti caste or other Hindu castes (Padmasali caste is omitted), and whether participant name came from referral.

2. Sample excludes participants who are dead or incapacitated.

person.

4. We report OLS regressions with robust standard errors in parentheses. Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Figure 1. Distribution of years winners lived in Colony A

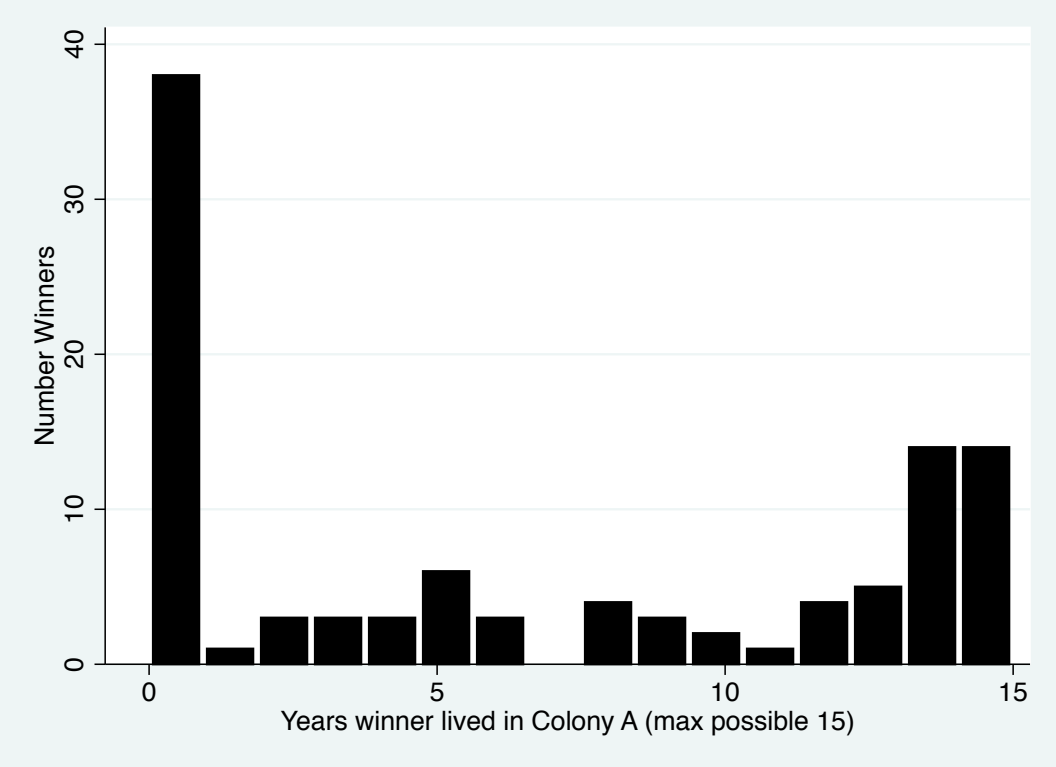
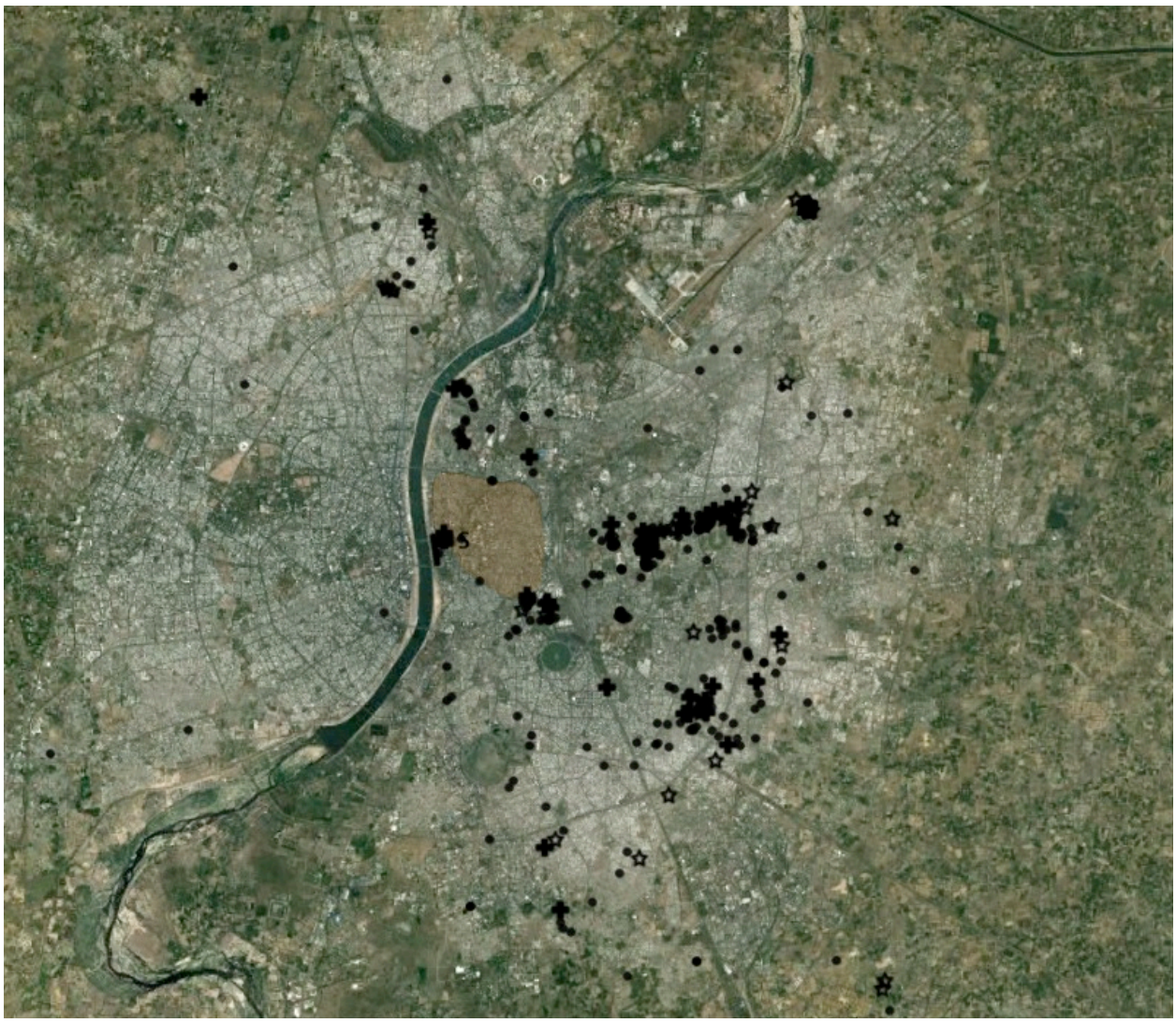


Figure 2. Lottery Participant Residential Locations in 1987

Dots: Non-winners. Plus Signs: Winners who never moved to Colony A. Stars: Winners who ever lived in Colony A. The flag marked S in the middle is union headquarters. The A in the north is Colony A. Map Source: Google Earth. Imagery Date: 10/31/2000.

Figure 3. Lottery Participant Residential Locations in 2007



Dots: Non-winners. Plus Signs: Winners who never moved to Colony A. Stars: Winners who ever lived in Colony A. The flag marked S in the middle is union headquarters.
Map Source: Google Earth. Imagery Date: 4/27/2012.

Appendix Table 1. Tracking summary results for named participants

Status	Can't be found to survey	Surveyed Participant	Surveyed Family Member*	Total
Can't find/ no current information	10	0	0	10
Found in Ahmedabad	0	397	**4	401
Moved away	6	17	0	23
Died	4	0	22	26
Died, family moved away	0	0	3	3
Total	20	414	29	463
Not named	34	0	0	34
Grand Total	54	414	29	497
Winners	5	96	9	110
Non-Winners	49	318	20	387

*Surviving daughter, son, or husband surveyed

**4 respondents incapable of answering personally due to mental health or age

Appendix Table 2. Checks for bias in tracking

	Outcome: Surveyed			
	(1)	(2)	(3)	(4)
Non-Winner	-0.081**		0.003	0.003
	(0.026)		(0.023)	(0.023)
No List		-0.942***		
		(0.017)		
Second Lottery		0.045*		
		(0.019)		
Referrals		-0.009		
		(0.049)		
Random Participant Subset		-0.060*		
		(0.025)		
Date of list				0.000
				(0.000)
Constant	0.955***	0.942***	0.955***	0.920***
	(0.020)	(0.017)	(0.020)	(0.087)
Observations	497	497	463	463
R-squared	0.010	0.614	-0.002	-0.004

Notes:

1. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

2. Dates of Lists are assigned as the date of the earliest list participant's name found/given

Random Participant Subset, 1987	Winners, 1993
Second Lottery, 1990	Referrals, 2007

Appendix Table 3. Housing Lottery Fairness

VARIABLES	**The lottery was done fairly**	**We won a house**
	(1)	(2)
Participant Won Lottery	0.158***	0.92***
	(0.03)	(0.03)
Muslim Participant	0.05	0.03
	(0.06)	(0.04)
Winner * Muslim	-0.03	-0.17
	(0.06)	(0.19)
Constant	0.82***	0.02***
	(0.02)	(0.01)
Observations	413	430
R-squared	0.037	0.81

Notes:

1. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

2. Column 1 was not asked when the lottery participant is dead or incapacitated.

Appendix Table 4. Move to Colony A among participant subset

	Participant or family ever lived in Colony A
Participant's 1987 income (hundreds of Rs.)	-0.64***
	(0.15)
Husband's 1987 income (hundreds of Rs.)	-0.26***
	(0.09)
Participant married in 1987	0.28
	(0.28)
Participant a widow in 1987	0.41**
	(0.18)
Husband was a tailor in 1987	-0.36
	(0.30)
Husband worked in a mill or factory in 1987	-0.24
	(0.22)
Constant	3.20***
	(0.65)
Observations	40
R-squared	0.28

Notes:

1. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix Table 5. Detailed Health

	Outcome Variable	Non-Winner	Coefficient on Winner		N
			No controls	Controls	
Participant	Dead or too incapacitated to complete survey herself	0.06	0.03	0.03	443
		[0.24]	(0.03)	(0.03)	
	Worse self-reported health status currently relative to others	0.14	-0.01	0.00	414
		[0.35]	(0.04)	(0.04)	
	Has any health problem that persisted for more than a year	0.09	-0.02	-0.01	413
		[0.29]	(0.03)	(0.03)	
	Took medicine for something in the last year/365 days	0.91	-0.03	-0.02	413
		[0.28]	(0.04)	(0.04)	
	Breathing problem	0.11	0.02	0.01	405
		[0.31]	(0.04)	(0.04)	
	Cough problem	0.03	-0.02	-0.02	405
		[0.18]	(0.01)	(0.02)	
	Back problem	0.16	0.01	0.02	405
		[0.37]	(0.04)	(0.05)	
	Difficult to carry a heavyload like 10 Kg. Rice for a few yards	0.15	0.03	0.04	414
		[0.36]	(0.04)	(0.04)	
	Difficult to stand up from sitting position on the floor (without help)	0.06	-0.01	-0.01	409
		[0.23]	(0.02)	(0.03)	
	Difficult to sit on the floor with bent knees for at least half an hour	0.07	-0.02	-0.01	414
		[0.26]	(0.03)	(0.03)	
Husband	Husband has died	0.05	0.02	-0.01	435
		[0.22]	(0.03)	(0.01)	
	Breathing problem	0.06	-0.02	-0.03	293
		[0.24]	(0.03)	(0.03)	
	Cough problem	0.01	0.04	0.03	293
		[0.09]	(0.03)	(0.03)	
	Back problem	0.04	0.02	0.01	293
		[0.20]	(0.03)	(0.03)	
	Alcoholic	0.03	0.00	0.00	293
		[0.16]	(0.02)	(0.02)	
Children	Son or daughter has died	0.04	0.02	0.02	1602
		[0.19]	(0.02)	(0.02)	
	Living son or daughter has breathing problem	0.00	0.01*	0.01*	1532
		[0.03]	(0.01)	(0.01)	
	Living son or daughter has coughing problem	0.01	0.00	-0.01	1532
		[0.09]	0.00	(0.01)	

1. The set of controls is individual indicator variables for whether participant is Muslim, Koshti caste or other Hindu castes (Padmasali caste is omitted), whether participant name came from referral.

2. Sample of participants is all found for first outcome variable and all alive and not infirm for the remaining participant health variables. Husband sample is all husbands for the first outcome variable and all husbands who are alive and living with participant for the remaining husband variables. Sample of children is all children born for first variable and all living

3. We report OLS regressions with Robust standard errors in parentheses. For children's outcomes, SE are clustered at the participant level. Standard deviations in brackets.*** p<0.01, ** p<0.05, * p<0.1

Appendix Table 6. Risk Sharing

	Has Someone to lend Rs. 50	Has Someone from whom can borrow Rs. 50	Has Someone from whom can borrow kerosene or rice	Has Someone to borrow Rs.500 from for health emergency
VARIABLES	(1)	(2)	(3)	(4)
Winner	-0.084*	-0.083*	-0.058	-0.080*
	(0.046)	(0.045)	(0.044)	(0.045)
Mean Non-Winners	0.877	0.884	0.868	0.877
	[0.329]	[0.321]	[0.339]	[0.329]
Observations	414	414	414	414
R-squared	0.02	0.015	0.015	0.024

	Person to whom lends Rs. 50 is from the same neighborhood	Person from whom borrows Rs. 50 is from same neighborhood	Person from whom borrows rice or kerosene is from same neighborhood	Person from whom borrows Rs. 500 is from same neighborhood
VARIABLES	(5)	(6)	(7)	(8)
Winner	0.029	-0.001	0.026	0.037
	(0.037)	(0.041)	(0.036)	(0.041)
Mean Non-Winners	0.789	0.792	0.786	0.767
	[0.408]	[0.407]	[0.411]	[0.424]
Observations	355	358	354	356
R-squared	0.044	0.038	0.044	0.034

	Years known person to whom lends Rs. 50	Years known person from whom borrows Rs. 50	Years known person from whom borrows rice or kerosene	Years known person from whom borrows Rs. 500
VARIABLES	(9)	(10)	(11)	(12)
Winner	-2.340*	-2.476*	-3.074**	-3.452**
	(1.341)	(1.323)	(1.352)	(1.427)
Mean Non-Winners	19.665	19.735	19.474	21.049
	[12.061]	[11.820]	[11.861]	[12.070]
Observations	354	357	354	356
R-squared	0.044	0.048	0.056	0.056

Notes:

1. Covariates: participant Muslim, Koshti caste, other Hindu castes (Padmasali omitted), referred.

Appendix Table 7. Community Projects

What activities have you and your neighbors worked on to benefit the community in the past three years? (all that apply)

	Number	
	Non-Winners	Winners
Nothing	258	60
Gutters	32	30
Running water (not potable)	11	1
Potable running water	9	3
Improving the school	0	1
Something for the Temple or Mosque	6	1
Road improvements	1	0
Negotiating rates with agents	1	0
Wedding for a neighbor	9	2
Funeral for a neighbor	13	2
School fees	1	0
Caring for ill person	2	2
Stone wall to prevent rodents	1	0
Navratri	1	0
Lighting	1	0
Dig borewell	0	1
	346	103

Notes:

1. Not asked in family surveys