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Same city, worlds apart: multidimensional poverty  
and residential segregation in Buenos Aires

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**Same City, Worlds Apart:  
Multidimensional Poverty and Residential Segregation in Buenos Aires**

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**Abstract:** One of the most salient characteristics of urban poverty and inequality in the City of Buenos Aires is the territorial segregation of poverty in informal settlements, the majority of which are concentrated in the city's southern zone. The objective of this paper is to analyze the gaps in both income and multidimensional poverty between the formal and informal neighborhoods of the City of Buenos Aires. We measure multidimensional poverty based on the method proposed by Alkire and Foster (2011) and income poverty based on the official poverty lines and measurement methodology, with the purpose of presenting a more accurate description of the incidence and intensity of poverty in these two distinct areas of the city. The analysis is based on the city government's 2016 Annual Household Survey, which is unique in that it collects data on a statistically representative sample of households living in the jurisdiction's informal settlements.

**Resumen:** Buenos Aires es la ciudad más próspera de nuestro país. Sin embargo, presenta altos niveles de desigualdad, que se expresan particularmente en la segregación territorial de la pobreza en asentamientos informales, la mayoría de los cuales se ubican en la zona sur de la ciudad. El objetivo de este documento es analizar las brechas en la pobreza, definida tanto de manera multidimensional como por ingresos, entre los habitantes de los barrios formales e informales de la Ciudad de Buenos Aires. Se mide la pobreza multidimensional mediante el método de Alkire-Foster (2011) y la pobreza por ingresos empleando la metodología oficial (Dirección General de Estadísticas y Censos, DGEyC-CABA). Este análisis complementario permite presentar una descripción más precisa de la incidencia e intensidad de la pobreza en estas dos zonas de la ciudad. El análisis se basa en los datos de la Encuesta Annual de Hogares, 2016 (DGEyC).

**JEL Codes:** Health, Education and Welfare/Welfare, Wellbeing and Poverty (I3); Urban, Rural and Regional Economics/Household Analysis (R2)

## **1. Introduction**

The City of Buenos Aires (CBA) is Argentina's most prosperous city and the nation's capital. Greater Buenos Aires, which includes the CBA and the surrounding peri-urban area, with a population of over 15 million is one of Latin America's eight mega-cities and the 13<sup>th</sup> largest city in the world (UN-Habitat, 2016b). The CBA ranks 30<sup>th</sup> with a score of 68.56 on the City Prosperity Index, just above Mexico City and Lima and below Warsaw, Athens and Barcelona (UN-Habitat, 2016a).<sup>1</sup> The city's stark inequality means, however, that while most of the population has a relatively high standard of living, the poorest experience an accumulation of deprivations in multiple dimensions of human life. The most salient characteristic of urban inequality in the CBA is the territorial segregation of poverty in informal settlements, the majority of which are concentrated in the city's southern zone.

During the past three decades the CBA experienced an acceleration in the growth of informal settlements. According to national census data, the share of the population living in informal neighborhoods increased from 1.8% in 1991 to 3.9% in 2001 and 5.7% in 2010 (DGEyC, 2011). A recent cadastral survey registered a total of 4,228 informal settlements in

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<sup>1</sup> The City Prosperity Index is a multidimensional index comprised of indicators in the following dimensions: productivity, infrastructure, quality of life, equity and social inclusion, environmental sustainability and governance and legislation.

Argentina (with around 800,000 families) and 55 settlements in the City of Buenos Aires (with around 85,000 families).<sup>2</sup>

Increasing urban segregation and spatial concentration of urban poverty in informal settlements are tendencies common to cities in Latin America and throughout the Global South (UN-Habitat, 2012; Mitlin and Satterthwaite, 2013). According to UN-Habitat (2016c), while the share of the global population living in urban slums declined from 46% to 30% between 1990 and 2014, the absolute number increased to 881 million, compared to 689 million in 1990. In Latin America—the most urbanized and unequal region in the world—104 million people (about 1 in 5) live in urban slums.

The concentration of poverty in informal settlements exacerbates aspects of poverty such as overcrowding, inadequate infrastructure and public services, insecurity and health problems associated with the congestion of people and industries (Mitlin y Satterwaite, 2013; Marx, Stoker and Suri, 2013). Authors such as Mitlin and Satterthwaite (2013) have called attention to the problem of underestimating urban poverty when national poverty lines are employed, which do not consider the territorial variation in the prices of goods and services, the structure of household expenditures (for example, between home owners and renters) and the quality and access to public services. New forms of poverty analysis are needed to gain a greater understanding of poverty within cities.

The objective of this paper is to analyze the gaps in both income and multidimensional poverty between the formal and informal neighborhoods of the City of Buenos Aires. We measure multidimensional poverty based on the method proposed by Alkire and Foster (2011) and income poverty based on the official poverty lines and measurement methodology, with the purpose of presenting a more accurate description of the incidence and intensity of poverty in these two distinct areas of the city. The analysis is based on the city government's 2016 Annual Household Survey, which is unique in that it collects data on a statistically representative sample of households living in the jurisdiction's informal settlements.

There is growing consensus that multi-dimensional poverty measures provide a conceptually more satisfactory measure of deprivation (Robeyns, 2017). Income (or consumption) poverty, however, is a concept that is easier to measure, understand and describe to broader audiences. As there is a longer history of monetary poverty measurement, these measures also can be used to analyze the long-term evolution in poverty. Here we have chosen to present a characterization of poverty based on both income-based and multidimensional measures. This complementary method allows us to describe poverty both in the space of resources and in the space of capabilities (Ruggeri Laderchi, Saith and Stewart, 2003). The consideration of these two spaces of analysis is relevant when facing territories where there is what Wolff and De-Shalit (2007) call *clustered disadvantage*. UN-Habitat (2012) describes in the following way the disadvantages faced by the inhabitants of slums “Living in a slum or neighborhood with a high concentration of poor people reduces access and opportunities for employment, education and services, while increasing exposure to urban violence and vulnerability to natural disasters.”

Complementary analysis of income and multidimensional poverty has quite a long history.<sup>3</sup> In 1988, Ringen argued that it was incompatible to employ a direct definition of wellbeing deprivation and an indirect method of measurement based on income, advocating instead for complementarity analyses of income and deprivation measurement. Callan, Nolan and Whelan (1993) presented an empirical application of Ringen's complementary

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<sup>2</sup> Registro Nacional de Barrios Populares (RENABAP). See <https://www.argentina.gob.ar/barriospopulares> and <http://www.telam.com.ar/notas/201801/245856-asentamientos-villas-barrios-populares-relevamiento-renabap.html>

<sup>3</sup> In his historical characterization of the development of poverty and wellbeing indicators, Sumner (2004) describes the economic nature of older indicators and the gradual inclusion of non-economic aspects in the conceptualization and measurement of well-being.

approach, and found “that employing both income and deprivation criteria rather than income alone can make a substantial difference to both the extent and composition of measured poverty.” Boltvinik (1992) presented in Latin America an integrated poverty measurement method, which simply combined income poverty with the widely used Basic Needs Indicator. Saunders (2003) argues that social exclusion occurs when people experience a combination of complex problems, such as unemployment, low skills, poor health, precarious housing and the rupture of family ties. Experiencing these types of social exclusion and monetary poverty are mutually reinforcing.

The introduction of the Alkire-Foster multidimensional poverty measure in 2008 has provided an intuitive and easily applicable method for multidimensional poverty measurement (Alkire and Foster, 2008). The use of multidimensional measures has grown considerably since then, both in academic literature and in practice, with the proliferation of national poverty measures based on this approach, particularly in Latin America.<sup>4</sup>

The literature on the complementarity between income and multidimensional poverty measurement has also grown.<sup>5</sup> Wang, Feng, Xia and Alkire (2016) differentiate between the studies that use income as an additional dimension within multidimensional measurement and those that measure income poverty as a complement to multidimensional measures. In the latter case, deprivations consist of non-monetary aspects of well-being. Recent applications of complementary analyses between income and multidimensional poverty include Suppa (2016); Tran, Alkire and Klasen (2015); Bader et al. (2016); Ballon et al. (2016) and Roelen (2017).

The paper is organized as follows. The second section describes the historical process of expansion of the informal settlements in the City of Buenos Aires, their spatial organization within the city and the principal sociodemographic characteristics of the inhabitants. The third section explains the poverty measurement methodology. The fourth section presents the results of the empirical analysis. The paper concludes with a summary of the paper’s main findings.

## **2. The informal settlements of the CBA**

Informal settlements, known locally as *villas*, first appeared in the City of Buenos Aires during the first half of the last century. Their formation was mostly associated with rural-urban migration of population seeking better jobs in Buenos Aires. Settlements such as the *villa* 21-24 in the neighborhood of Barracas, the 1-11-14 in Bajo Flores and the 31-31bis in Retiro were amongst the first to have formed and date back to the 1930s or earlier. After 1940 the migration process accelerated during the period of import substitution-based industrialization. According to government studies, by 1976 the informal settlements of Buenos Aires had approximately 210,000 inhabitants (Mazzeo, 2008). However, the last military dictatorship in power from 1976 to 1982 applied an eradication policy that reduced the population living in the *villas* to 40,000. These policies shaped the history of these neighborhoods and the identity of the citizens living within their boundaries (Suarez, Mitchell and Lépore, 2014).

Following the return to a democracy, the population living in the *villas* of the CBA gradually increased. Economic factors explain the expansion of the city’s informal settlements during the period of deindustrialization of the 1990s and the severe economic and social crisis of 2001 (Defensoría del Pueblo, 2016). The growth of the population living in informal neighborhoods during the past three decades was associated not only with

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<sup>4</sup> See Outes (2017) for a description of the official multidimensional poverty measures adopted by the governments of México, Chile, Colombia, Costa Rica and El Salvador.

<sup>5</sup> Even the World Bank—the international institution responsible for measuring global monetary poverty—has begun to produce complementary nonmonetary measures. This change was one of the principal recommendations of the Commission on Global Poverty led by Sir Anthony Atkinson (World Bank, 2017)

growth in the population living in existing settlements, but also the formation of new ones. *Los Piletones*, located Villa Soldati, for instance, was created in the early 1990s when families from different cities of Argentina moved to unoccupied and contaminated land in the city's southern zone. The *Barrio Ramón Carrillo*, a Transitory Housing Settlement (or Núcleo Habitacional Transitorio, NHT in Spanish) was built in 1990 to house hundreds of families that had been living in an abandoned and unsafe 10 story-high building, known as the *Albergue Warnes*.

Today the most significant demographic dynamic in the City of Buenos Aires is produced in *villas*, as the population in the rest of the city has remained practically constant at around 3 million for the past 70 years.<sup>6</sup> The 2010 National Census reported 42 *villas* with around 36,000 dwellings and 170,000 inhabitants, occupying about 264 hectares of land (INDEC, 2010). More recent estimates, such as the RENABAP, indicate that the true population more than doubles this amount. The largest informal settlements in terms of population and area are *Villa 21-24* in Barracas, *Villa 31* and *31 bis* in Retiro, *Villa 1-11-14* in Bajo Flores, *Villas 20* in Lugano and *Villa 15-Ciudad Oculta* also in Lugano (DGEYC, 2015).

In this document we use the term *villas* to refer to three different types of informal neighborhoods: *villas*, transitory housing settlements and urban settlements<sup>7</sup> (Map 1). The location of the *villas* in the city center provides diverse benefits to the residents, such as accessibility to educational and health services and the availability of quick and cheap means of transportation to workplaces. The disadvantages, however, include insecure tenancy (most of the neighborhoods are located on state-owned lands), contaminated land, flooding and proximity to environmental and other hazards.

Although we referred to the technical definition of *villas* (see footnote 7), a strict definition is not necessary as these neighborhoods have a well-known history and can be easily recognized by the general public, although often ignored. Lidia de la Torre (2009) refers to the *villas* as the “invisible city” or “non-places,” territories that are ignored in all aspects except the negative ones.

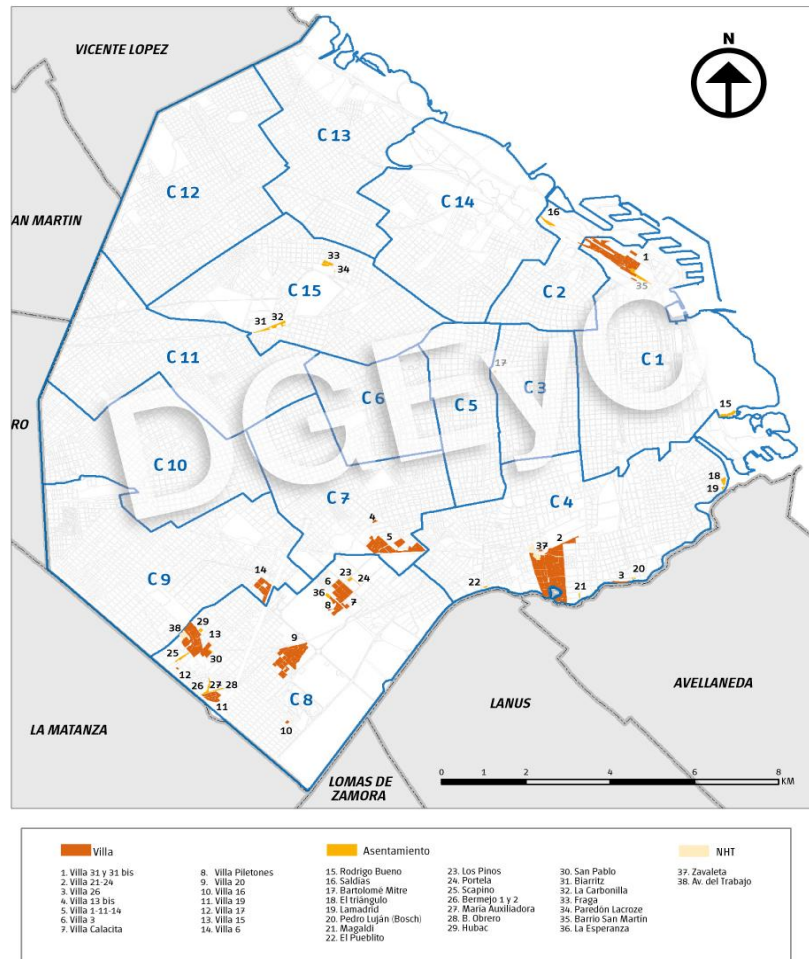
The demographic composition of *villas* contrasts sharply with that of the rest of the city. Whereas the City of Buenos Aires has an aging population (nearly 1 in 5 residents is over age 64), the population of the *villas* is remarkably young. Over 40% of the residents of the *villas* is under age 18 and 18% under age 6, while only 3% is over age 64. The demographic pyramid of the CBA resembles that of a European city, while the *villas* have a pyramid with a wide base similar to that of underdeveloped countries (Graph 1). This means that the average number of dependents relative to the working age population in the *villas* (84%) more than doubles the rate in the rest of the city (38%). One in four households in the *villas* is headed by a single parent compared with one in ten households outside of the *villas*

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<sup>6</sup> The National Census of 1947 shows a total population of 2.98 million, while the National Census of 2010 presents 2.89 million. Statistical forecasts for 2018 are 3.07 million. (Figures obtained from the Dirección General de Estadísticas y Censos, CABA, available at: <http://www.estadisticaciudad.gob.ar/eyc/?p=28020>).

<sup>7</sup> DGEyC (2015a) defines *Villas* as unplanned settlements, of irregular outline, originated with the illegal occupation of state land, whose dwellings are initially formed with discarded materials and are gradually improved by their inhabitants. Public services and equipment increase progressively with the action of the State or of civil society institutions. In CBA (...) the *villas* have basic sanitation services (safe water, sewage and garbage disposal), but the conditions and quality of the services are not as good as for the rest of the city. TECHO (2016) considers *Villas* can be defined as informal urbanizations that have an irregular layout, accessed through narrow passageways with a high population density and self-made structures often several stories high. For DGEyC (2015a), a Settlement is a group of people irregularly settled on state or private land which cannot be urbanized nor destined to residential use. They are located in places such as the margins of a railway, under a bridge, in a public square, in empty plots of land, in lands that flood, etc. Dwellings are very precarious and they have no urban services. Habitational conditions are absolutely transitory. Finally, DGEyC (2015a) defines Transitory Housing Settlements (NHT, in Spanish) as a set of multi-family dwellings constructed as a transitory housing solution for dwellers of *villas*, while permanent houses or apartments are built which they will fully own. NHTs were built as transitory but they became permanent but precarious locations for their dwellers.

**Map 1: Villas, settlements and transitory housing settlements  
in City of Buenos Aires, 2015**

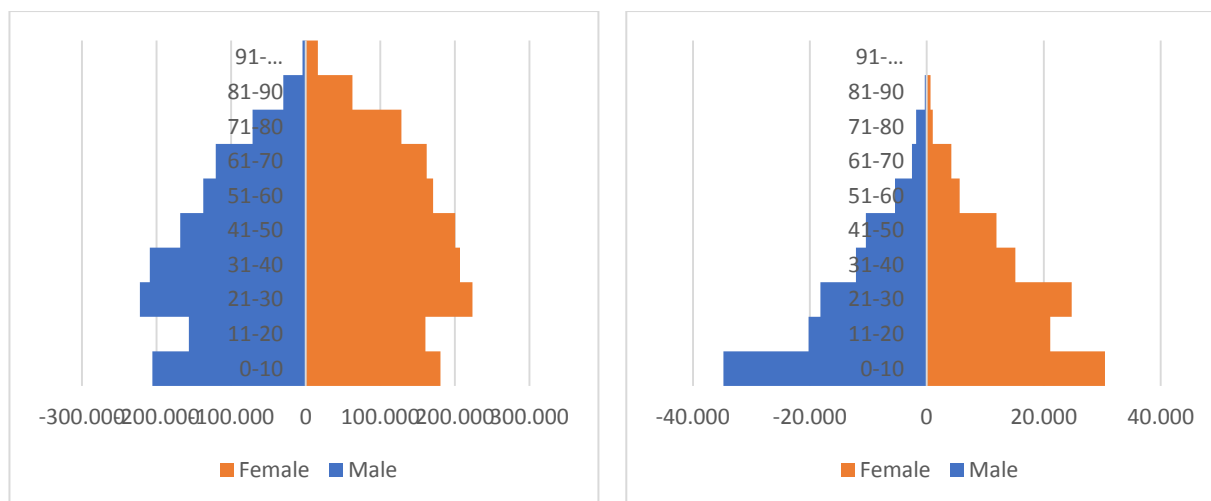


Source: DGEyC (2015b).

**Graph 1: Demographic pyramids for Villas and the rest of Buenos Aires**

**Rest**

**Villas**



Source: Calculations based on EAH, 2016.

Households in the city's *villas* are also significantly larger, with an average of 4.2 members compared with 2.3 members in the rest of the city. This characteristic is related to the strategy of incorporating other family members (such as grandmothers, aunts and siblings), as a strategy to cope with disadvantages such as the lack of access to child care for working parents. As a result, more than 20% of the households in the *villas* have more than 5 members compared with only 2% of households outside of the *villas*. The other salient demographic characteristic is the large immigrant population. Two out of the three heads of household were born in another country, mostly from neighboring Bolivia and Paraguay and to a lesser extent Peru. Outside the *villas*, only 12% of heads of household are foreign.

### 3. Poverty measurement methodology

In this section we describe the methodology used to measure income poverty and multidimensional poverty in the City of Buenos Aires. All estimates are based on data from the Government of the City of Buenos Aires' 2016 Annual Household Survey (DGEyC, 2016a). The survey design is based on three separate sampling frames, each with its own two-stage stratified sampling: (i) residential properties; (ii) hotels, tenement houses, and occupied dwellings (HTH&OD)<sup>8</sup> and (iii) *villas* and informal settlements.<sup>9</sup> The survey provides statistically representative samples for the total CBA, each of the 15 districts (or *comunas*) and each of the sampling frames, thereby permitting the analysis of the gap in poverty between the formal and informal areas of the city.

#### 3.1 Income poverty

In order to measure poverty with the traditional, income-based method, households are identified as poor when their level of total household income per adult equivalent,  $Y_i$ , is below the poverty line,  $Z$ . Total household income is measured as the sum of the labor income earned by all of the household members plus the sum of all sources of nonlabor

<sup>8</sup> Although the survey provides a statistically representative sample of the population living in hotels, tenement houses and occupied dwellings, as these types of housing tend to be scattered throughout the city, do not share a common historical identity and are generally transitory, in this paper we focus on the poverty gap between *villas* and informal settlements and the rest of the city. Preliminary analysis indicates that the population living in hotels, tenement houses and occupied dwellings has an intermediate level of income poverty and levels of deprivation in education, employment and overcrowding similar to the population in the city's informal settlements.

<sup>9</sup> In 2016 residential properties, HTH&OD and *villas* and informal settlements represented, respectively, 91.6, 4.3 and 4.1 percent of households and 88.9, 3.8 and 7.2 percent of the population.



income received during the previous month.<sup>10</sup> Adult equivalent household income is equal to total household income divided by the number of adult equivalent household members, calculated based on the adult equivalence scale (DGEyC, 2016b).

We employ the official poverty line set by the Government of the CBA (DGEyC, 2016b).<sup>11</sup> The methodology used to construct this line consisted of first defining a Basic Food Basket that satisfies the caloric needs of a representative consumer (a male between ages 30 and 59 with moderate activity and whose caloric requirement is 2720 calories per day), reflects the food consumption habits of the population and food items of lowest cost. The value of the Basic Food Basket was calculated using price data from the city government's consumer price index. The extreme poverty or indigence line is set equal to the value of the Basic Food Basket. To construct the poverty line, the value of twelve additional subgroups of expenditures, which reflect the consumption habits of the population, were added to the value of the Basic Food Basket to obtain the Total Consumption Basket. The expenditure categories include rent, housing, electricity, water, gas, education, public transport, communication (telephone and Internet), cleaning products, entertainment, clothing, health, household furnishings and other goods and services. Consumption units and minimum requirements for the reference population were set for each of the nonfood components of the Total Consumption Basket. These requirements were then expanded to the household level using equivalence scales for each expenditure category and information on household size and the age of the household members (calculations are described in detail in DGEyC, 2010).

We present estimates of three indices in the family of poverty measures proposed by Foster, Greer y Thorbecke (1984), written as:

$$FGT_{\alpha} = \frac{1}{N} \sum_{i=1}^H \left( \frac{z - y_i}{z} \right)^{\alpha} \quad (1)$$

where H is the number of poor households and N is the total number of households. When  $\alpha=0$ , the formula reduces to the poverty headcount ratio; when  $\alpha=1$ , it indicates the average normalized gap between the income of the poor and the poverty line, and when  $\alpha=2$ , it indicates the weighted normalized gap, where the weight is equal to the gap itself.

### 3.2 Multidimensional poverty

We employ the method proposed by Alkire and Foster (2011) to measure multidimensional poverty. This method is a counting approach that assesses poverty based on the number of deprivations that people experience in multiple dimensions of life. To apply the method, it is necessary first to select the dimensions of analysis and one or more indicators within each dimension. For each indicator one must then choose a deprivation cut-off, that is, the level of achievement considered to be sufficient for a person to be non-deprived. The next step is to select indicator weights such that the sum of the weights equals one. These criteria are then used to calculate the weighted share of indicators in which the person (or household) is deprived, known as the deprivation score,  $c_i$ .

A unique property of the Alkire-Foster methodology is that it is a dual cut-off approach. In addition to setting deprivation cut-offs for each indicator, one must also set a poverty cut-off ( $k$ ), which indicates the proportion of weighted deprivations a person must experience in order to be identified as poor. If a person has a deprivation score greater than or equal to the poverty cut-off ( $c_i \geq k$ ) she is considered to be multidimensionally poor. The censored deprivation score  $c_i(k)$  is equal to the deprivation score  $c_i$  for poor households and equal to zero for nonpoor households.

<sup>10</sup> The sources of nonlabor income include retirement and other forms of pension, rental and interest income, gifts and transfers from persons outside of the household, government transfers and subsidies and other forms of nonlabor income (including profits and dividends, scholarships, severance payments, food subsidies).

<sup>11</sup> <http://www.estadisticaciudad.gob.ar/eyc/?p=70579>.



This information can then be used to construct three multidimensional poverty measures that consist of a multidimensional extension of the FGT family of unidimensional poverty measures (Foster, Greer and Thorbecke, 1984). The multidimensional headcount ratio,  $H$ , represents the proportion of households identified as multidimensionally poor:

$$H = \frac{q(k)}{n} \quad (2)$$

where  $q(k)$  is the number of multidimensionally poor people (or households) and  $n$  is the total number of people. The intensity of multidimensional poverty,  $A$ , is defined as the average share of weighted indicators in which poor households are deprived:

$$A = \frac{\sum_{i=1}^q c_i(k)}{q(k)} \quad (3)$$

This indicator measures the breadth of deprivations experienced by the multidimensionally poor. The adjusted headcount measure,  $M_0$ , is calculated as the product of  $H$  and  $A$ :

$$M_0 = HA = \frac{q}{n} \frac{1}{q} \sum_{i=1}^q c_i(k) = \frac{1}{n} \sum_{i=1}^q c_i(k) \quad (4)$$

$M_0$  measures the sum of the weighted deprivations experienced by poor households, divided by the maximum number of deprivations that could be experienced by all households if all households were poor and deprived in all dimensions.  $M_0$  increases either when an additional household becomes multidimensionally poor or when any poor household becomes deprived in another dimension.

The dimensions, indicators and deprivation cut-offs selected for our measure are presented in Table 1. The unit of analysis is the household. Based on a revision of experiences of multidimensional poverty measurement in Latin America (Outes, 2016) and the data available in the Annual Household Survey we selected the following dimensions of analysis: education, health, housing and work. Between one and three indicators were selected within each dimension. In some cases, the indicator refers to the collective situation of the household and in other cases the indicator aggregates the situations of deprivation of the household members. We employ equal weights for each dimension and for each indicator within each dimension.

The first dimension of analysis—education—has both intrinsic value and is essential to expanding other capabilities such as work or health (Unterhalter, 2010). Schooling is essential for teaching people to become active agents in their lives, to understand their rights and responsibilities and to express their points of view. The capability approach literature, which provides a theoretical basis for the construction of multidimensional poverty measures, recognizes that not all people will benefit from education in the same way (Hart, 2012). The cultural, social and institutional context determines how the resources provided by education are converted into valuable opportunities.

**Table 1: Dimensions and indicators of the Alkire-Foster poverty measure**

| Dimension/Indicator             | Definition of indicator   | CBA              | Villas           | Rest             |
|---------------------------------|---|------------------|------------------|------------------|
| <b>Education</b>                |   |                  |                  |                  |
| Education level adults          | None of the members has completed secondary school.   | 0.161<br>(0.368) | 0.510<br>(0.5)   | 0.147<br>(0.354) |
| School enrollment               | At least one child ages 5-17 does not attend school.  | 0.007<br>(0.086) | 0.058<br>(0.233) | 0.005<br>(0.073) |
| Overage enrollment              | At least one child attends nursery, primary or secondary school and is over the age corresponding to the level. | 0.053<br>(0.223) | 0.273<br>(0.446) | 0.043<br>(0.203) |
| <b>Health</b>                   |   |                  |                  |                  |
| Health insurance                | At least one household member does not have health insurance.   | 0.206<br>(0.404) | 0.883<br>(0.322) | 0.177<br>(0.382) |
| <b>Housing</b>                  |   |                  |                  |                  |
| Overcrowding                    | The number of household members per room is greater than 3.   | 0.013<br>(0.115) | 0.119<br>(0.325) | 0.009<br>(0.094) |
| Housing tenancy                 | The household is not the legal owner of their dwelling and/or their land parcel.                                | 0.130<br>(0.336) | 0.686<br>(0.464) | 0.107<br>(0.309) |
| <b>Work and Social security</b> |   |                  |                  |                  |
| Working                         | None of the household members 18 years and older works.   | 0.051<br>(0.22)  | 0.128<br>(0.335) | 0.048<br>(0.213) |
| Work quality                    | None of the household members 18 years and older has <i>formal</i> employment.                                  | 0.366<br>(0.482) | 0.627<br>(0.484) | 0.355<br>(0.479) |

Notes: Calculations based on DGEyC, 2016a. Standard deviation in parenthesis.

Three indicators were selected within the education dimension. The first measures the deficit in schooling of adult members. Households are considered to have a deficit in this indicator when none of the members has completed secondary school. A secondary school diploma is considered to be a prerequisite for obtaining a decent job in Argentina and parents with secondary schooling are better prepared to help their own children with schoolwork. The second and third indicators measure deficits in school enrollment. A household is considered to be deprived in the indicator of school attendance when at least one child ages 5-17 does not attend school.<sup>12</sup> The indicator of overage enrollment identifies situations in which grade repetition or periods of school dropout causes students to be enrolled in a schooling level below that corresponding to their age.

Health is one of the most basic human capabilities (Sen, 1999a). Martha Nussbaum (2003) refers directly or indirectly to this dimension in at least three items included in her list of central capabilities: bodily health, bodily integrity and “thought, imagination and senses.” Strong physical and mental health are instrumental to other capabilities, such as education, work, mobility or civic participation. Health influences what Sen (1999b) refers to as “conversion factors”, that is, how individuals convert economic resources into the capability to be and do what they value and have reason to value. At the same time, health depends on the quality of access to public health services and also on having the ability to work, earn income and purchase health services in the market. Poor health, therefore, can be considered to be both a cause and a consequence of poverty.

The indicator chosen within the health dimension seeks to measure the quality of access to health care.<sup>13</sup> A household is considered to be deprived if at least one household

<sup>12</sup> The ages corresponding to each schooling level are: 5 years for preschool, 6-12 years for primary school and 13-17 years for secondary school. The classification is based on the age of each child as of June 30<sup>th</sup>, which is the date that determines the school year in which a child enters school.

<sup>13</sup> In her conceptualization and operationalization of health capability, Prah Ruger (2010) considers access to health services as part of the external factors that affect an individual's health capability.

member does not have health insurance.<sup>14</sup> Persons without health insurance in Argentina depend solely on the health services provided by public hospitals or health clinics which imply inconveniences, such as long waiting periods for appointments, especially for complex services, and in some cases shortages of supplies.

The third dimension of analysis is housing. The inferior size and quality of housing and insecure tenancy influence multiple dimensions of wellbeing. People who live in overcrowded dwellings experience lack of privacy and more intense social demands, which can negatively affect both psychological health and interpersonal relations (Gove, Hughs and Galle, 1979). Empirical studies have demonstrated the association between the limited size and quality of the dwelling and physical and mental health (Newman, 2008; Evans, 2003), sleep (Simonelli et al., 2013), security (Bonney, 2007) and education (Evans et al., 1998; Solari and Mare, 2011). The absence of legal property titles can restrict investment in housing improvements or enlargement and limits the use of the property to enter into contracts with other parties, such as renting, mortgaging or using the dwelling as collateral (Brakarz and Jaitman, 2013).

The two housing related indicators chosen for the multidimensional poverty measure are overcrowding and insecure tenancy. For the indicator of overcrowding we adopt UN-Habitat's (2009) definition that considers a house to be overcrowded when the number of persons per room is greater than 3. A household is considered to be deprived in the tenancy indicator when the household is not the legal owner of the dwelling and/or the parcel of land.<sup>15</sup> Households that rent the dwelling in which they reside are classified as not deprived.

Work is a fundamental aspect of human life. It is the principal source of income and therefore essential for achieving diverse capabilities. Work also has an intrinsic value, as it enables one to achieve a sense of satisfaction and purpose in life, a sense of belonging, a structure and a foundation over which an identity can be built (Bonvin, 2012; Egdell and Mcquaid, 2016; OPHI-CAF, 2016). Martha Nussbaum's (2003:41) refers directly to work in her list of central capabilities when defining "control over one's environment" which includes "having the right to seek employment on an equal basis with others." Weidel (2018:79) has argued for adding the capability for meaningful labor to Nussbaum's (2003) list of human capabilities, suggesting the following definition: "being able to freely and successfully pursue an avenue by which a person can engage in meaningful labor, interacting with some aspect of nature (as well as other human beings) in a way that develops their faculties, utilizes practical reasoning, and provides them with a sense of dignity."

Within the work dimension we consider two indicators designed to capture different degrees of deprivation. The first identifies households in which none of the adult members works.<sup>16</sup> The second identifies households in which none of the members has *formal* employment, based on a legal definition of formality. Workers with informal employment include wage earners who do not pay social security taxes and self-employed persons who have not completed the tertiary or university levels of education. Households that are deprived in the first indicator are necessarily also deprived in the second.

We set the poverty threshold (k) at 37.5% weighted indicators. Since each dimension has a weight of 25%, a household must be deprived in more than one full dimension (strictly, in at least one and one-half dimensions) in order to be identified as multidimensionally poor. For example, a household deprived in all three education indicators and one indicator within the housing or work dimension would be classified as multidimensionally poor.

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<sup>14</sup> The only other health indicator included in the Annual Household Survey is a subjective measure of the level of health of each household member based on the perception of the survey respondent.

<sup>15</sup> This survey question measures the survey respondent's perception of tenancy.

<sup>16</sup> Households are not considered to be deprived in this indicator if all of the members are over age 18 are enrolled in tertiary or university level education or all of the members are over age 65 and at least one of the members is retired or receives another form of pension. It was particularly important to make these exceptions when analyzing multidimensional poverty in the CABA due to the large proportion of residents over age 65 and the large number of university students, as many of Argentina's universities are located in this jurisdiction.

Finally, before constructing our Alkire-Foster poverty measure, we evaluated the association between our eight chosen indicators, so as to identify possible redundancy. We produced 28 cross tabulations to assess the association between all pairs of indicators. For each table we obtained the  $\chi^2$  statistic for testing the independence between dichotomous variables. Following Alkire et al. (2015), we then analyzed the redundancy coefficient for those pairs of indicators that are not independent according to the  $\chi^2$  test ( $p < 0.05$ ). The null hypothesis of independence was rejected for 26 of the 28 tests but only the pair overcrowding and health insurance had a redundancy coefficient greater than 0.75. Since the magnitude of the association between the selected variables was low, we decided not to drop any of the indicators from the measure.

## 4. Results

This section presents a comparative analysis of income and multidimensional poverty within and outside of the informal settlements of the City of Buenos Aires. The first subsection assesses poverty based on the traditional income-based methodology. The second subsection presents the individual deprivation indicators in the education, health, housing and work dimensions and each of the Alkire-Foster measures. The third subsection analyzes the relationship between income and multidimensional poverty. The final subsection decomposes the income and multidimensional poverty measures based on different demographic indicators so as to identify and compare poverty risk factors within informal settlement with the rest of the city.

### 4.1 Income poverty

Table 2 shows the estimates of the three FGT measures of income poverty for the total CBA, households living in informal settlements and the rest of the city. Whereas 79% of households in the *villas* have income below the poverty line, in the rest of the city the percentage descends to 14%. In the *villas* the value of the per capita income gap (FGT<sub>1</sub>), which captures the depth of poverty, is equal to .365, seven times higher than in the rest of the city. The territorial gap in poverty is even more pronounced when one compares the FGT<sub>2</sub> index which considers not only the depth of poverty but also the distribution of income below the poverty line.

**Table 2: Extreme poverty, FGT<sub>0</sub>, FGT<sub>1</sub>, FGT<sub>2</sub> and mean household income for households in *villas* and in the rest of the City**

|              | Extreme<br>poverty<br>FGT <sub>0</sub><br>(SE) | Poverty<br>Headcount<br>FGT <sub>0</sub><br>(SE) | Mean<br>Poverty Gap<br>FGT <sub>1</sub><br>(SE) | Poverty<br>Severity<br>FGT <sub>2</sub><br>(SE) | Mean<br>Income<br>(SD) |
|--------------|--|--|---|---|------------------------|
| Total        | 0.037<br>(0.003)                               | 0.165<br>(0.006)                                 | 0.065<br>(0.003)                                | 0.038<br>(0.002)                                | 26,272<br>(22476)      |
| <i>Villa</i> | 0.252<br>(0.027)                               | 0.792<br>(0.022)                                 | 0.365<br>(0.018)                                | 0.222<br>(0.016)                                | 13,524<br>(9633)       |
| Rest         | 0.028<br>(0.003)                               | 0.138<br>(0.005)                                 | 0.052<br>(0.003)                                | 0.030<br>(0.002)                                | 26,802<br>(22697)      |

Notes: Calculations based on EAH 2016, DGEyC, using DASP Module. SE indicates Standard error. SD indicates deviation.

The table also presents estimates of the percentage of households living in extreme poverty, meaning they do not have sufficient income to satisfy food needs. One in four households in the *villas* is identified as extremely poor, compared with only 3% of households outside of the *villas*. Although the survey employed here does not collect the data needed to estimate food insecurity, the extreme poverty rate which can be considered to be an indirect or proxy indicator for the food deprivation, shows an alarmingly high level. Finally, the estimates of mean total family income show that incomes in the rest of the city roughly duplicate incomes inside the *villas*.<sup>17</sup>

## 4.2 Multidimensional poverty

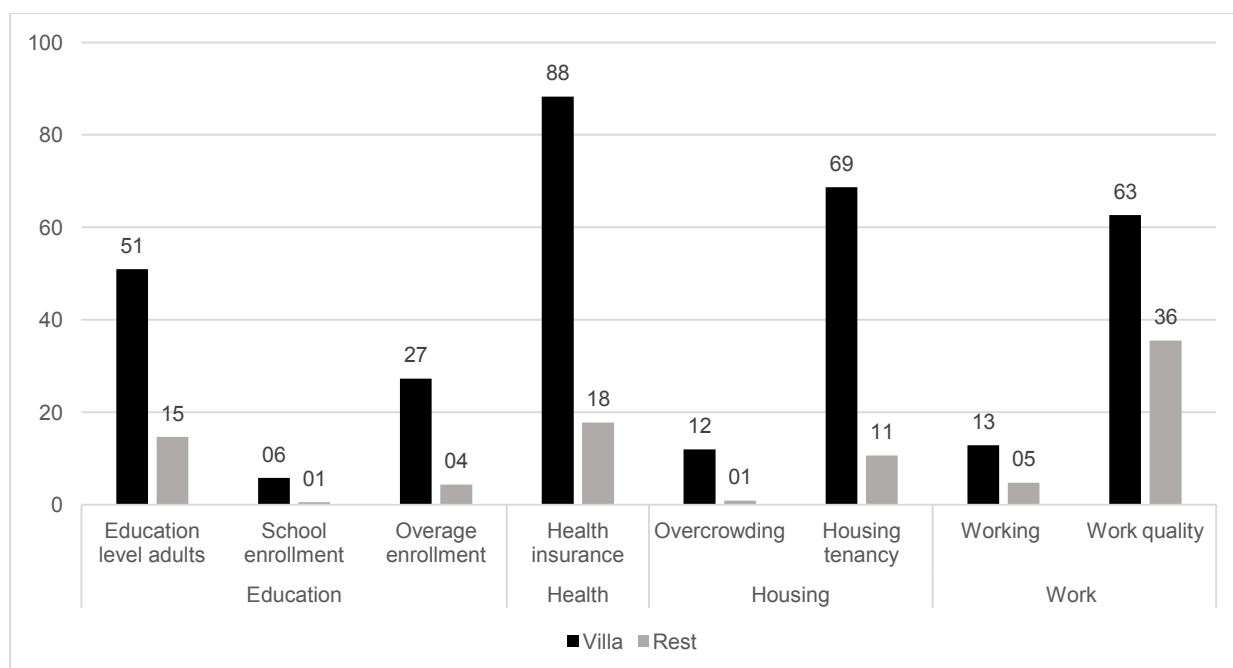
We begin the analysis of multidimensional poverty by comparing the deprivation rates of each of the indicators used to construct the multidimensional poverty measure for households living in *villas* with the rest of the city. The results are presented in Figure 1.

In education, there is a sharp territorial gap in both the educational attainment of adults and in school attendance. More than half of the households living in the *villas* have at least one adult member who has not completed secondary school, compared with only 15% of households in the rest of the city. The relative gap is even larger in the case of the enrollment indicators. The introduction of diverse policies to promote school attendance have enabled the CBA to achieve practically universal access to primary and secondary school: only 0.5% of households outside of the *villas* have at least one child ages 5 to 17 not enrolled in school. Within the *villas*, however, 6% of households are deprived in this indicator. In addition, while the problem of overage enrollment affects only 4% of households outside of the *villas*, in the *villas* 27% of households has a child or adolescent enrolled in a schooling level that does not correspond to her age. Previous research has shown that overage enrollment in the *villas* is particularly high at the secondary school level (Mitchell and Peregalli, 2014).

Health is the dimension in which we observe the largest absolute gap in deprivation rates between households living within and outside of informal settlements. Whereas 88% of the households in the *villas* have at least one member who does not have health insurance, in the rest of the city the rate falls to only 18%. Moreover, it should be noted that the territorial inequality of access to public health services is exacerbated by the fact that there are fewer public hospitals in the southern zone of Buenos Aires where most of the *villas* are located. Within the settlements, public health services are provided by the CeSACs (Health and Community Attention Centers), low complexity units which cannot satisfy the growing demand for services (Macció, 2015). In addition, the narrow unpaved streets and insecurity reduces the access to ambulance services within the informal neighborhoods.

**Figure 1: Deprivation rates in education, health, housing and work**

<sup>17</sup> We can also consider the possibility of non-declaration or sub-estimation of higher incomes, in a city where insecurity levels and fiscal pressure can operate as incentives to under declare incomes in a public survey. See DGEyC (2016) for more information on this subject.



Notes: Calculations based on DGEyC, 2016.

In the housing dimension we also find broad territorial differences in deprivation rates. While less than 1% of households in the rest of the city experience overcrowding, this problem affects 12% of households in the *villas*. The territorial disparity in this indicator is explained by both the reduced size of the dwellings and large family size in the *villas*. Not surprisingly, a far higher percentage of households living in the *villas* (69%) do not legally own their dwelling or land parcel than in the rest of the city (11%). It is important to clarify that the measure of tenancy is based on the subjective perception of the survey respondent. Although until recently none of the residents of the *villas* of the CBA had a formal property title, households that rent a dwelling or had paid for their dwelling through regular installments<sup>18</sup> may perceive that they have secure tenancy even when do not have a formal title.

Within the work dimension, although we observe a marked difference in the rates of deprivation within and outside of the *villas*, the gap is relatively less pronounced than in the other dimensions. The percentage of households with no working members is 13% in the *villas* compared with 5% in the rest of the city. This gap can be explained both by territorial differences in demographic characteristics and in labor market opportunities. The households in the *villas*, for example, are more likely to be headed by single women with children (10% versus 7% outside of the *villas*). Single mothers living in the *villas*, however, are also more likely to be unemployed (25%) than those living outside of the *villas* (7%). On the other hand, household heads have a similar labor force participation rate inside and outside the *villas*, a finding that is consistent with previous research<sup>19</sup>. The territorial gap in access to formal jobs is also pronounced. Whereas in 63% of households in *villas* none of the household members has formal employment, in the rest of the city the percentage is 36%.

So as to explore the relationship between the indicators that comprise our Alkire-Foster measure and income poverty, Figures 2 and 3 disaggregates the deprivation rates by

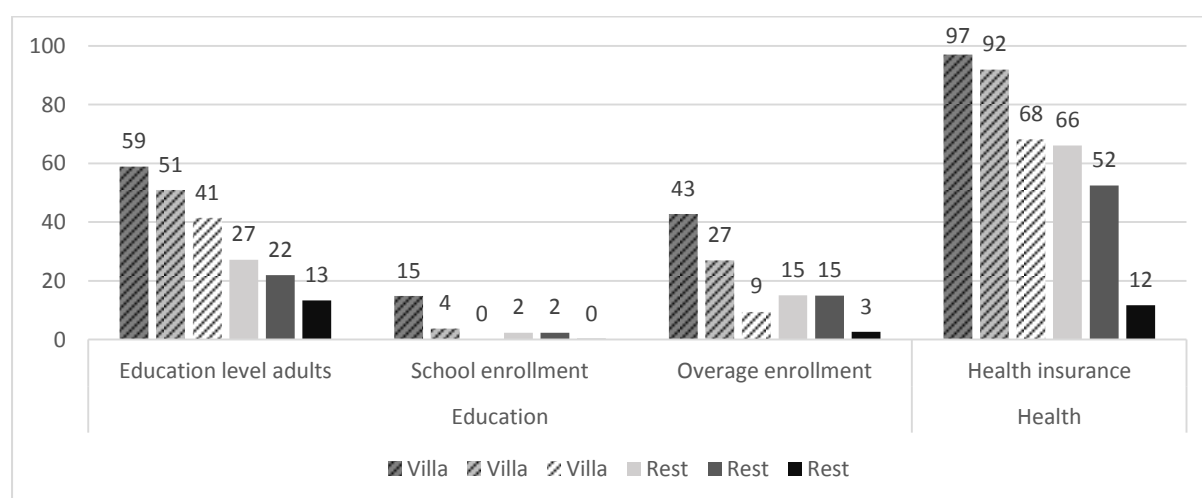
<sup>18</sup> For example, the residents who relocated to the NHT Ramon Carrillo paid regular installments for their homes but never received a legal title.

<sup>19</sup> Lepore (2014) showed household heads have a similar work force participation rate inside and outside the *villas*.

territorial location and the classification of households as extremely poor, poor but not extremely poor and nonpoor. Overall the results suggest that there is a strong positive association between each of the deprivation indicators and income poverty. Education and work are the dimensions in which this association appears to be the strongest. At the same time, for all of the dimensions except work, residency in a *villa* appears to be strongly associated with deprivation even with among households classified as extremely poor or poor. For example, whereas 59% of extremely poor households in the *villas* have at least one household member that did not complete secondary school, this percentage drops to 27% among extremely poor households in the rest of the city. Not surprisingly, housing tenancy is the deprivation indicator that appears to be most closely related to localization within an informal neighborhood and for which the association with income poverty is the weakest.

The results for the work dimension differ from those of the remaining dimensions. Among households classified as either extremely poor or poor, the percentage of households deprived in the work indicator is relatively *lower* in the *villas* than in the rest of the city. In the case of the work quality indicator, while the deprivation rates for each poverty group are somewhat higher within the *villas* than outside, the difference is less pronounced than in education, health or housing.

**Figure 2: Deprivation rates in education and health by localization in *villas* and income poverty classification**



Notes: Calculations based on DGEyC, 2016.

**Figure 3: Deprivation rates in housing and work by localization in *villas* and income poverty classification**





Notes: Calculations based on DGEyC, 2016.

Table 2 presents the estimates of the three Alkire-Foster multidimensional poverty measures for the City of Buenos Aires, households in *villas* and the rest of the population. The results indicate that 84% of the households living in *villas* are multidimensionally poor, that is, deprived in at least 37.5% of the indicators. In the rest of the city the multidimensional poverty headcount is only 11% and the city as a whole has a headcount of 14%.

**Table 2: Alkire-Foster Measures of Multidimensional Poverty**

|                              | CBA              | Villa            | Rest             |
|------------------------------|------------------|------------------|------------------|
| Headcount (H)                | 0.140<br>(0.005) | 0.841<br>(0.02)  | 0.110<br>(0.005) |
| Intensity (A)                | 0.470<br>(0.004) | 0.538<br>(0.009) | 0.448<br>(0.004) |
| Adjusted Headcount ( $M_0$ ) | 0.066<br>(0.002) | 0.452<br>(0.013) | 0.049<br>(0.002) |
| n                            | 5998             | 456              | 5542             |

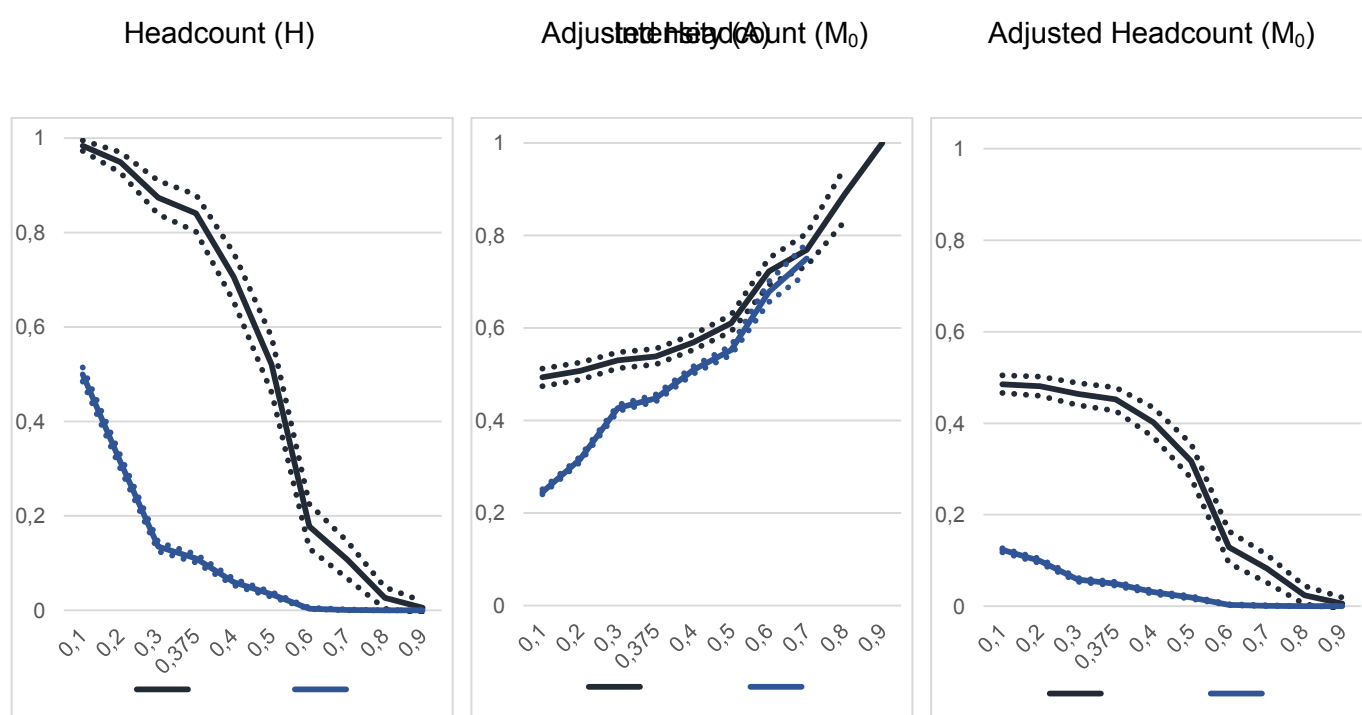
Notes: Calculations based on DGEyC (2016). Standard errors in parenthesis.

The comparison of the measures of poverty intensity A indicates that the *villas* not only have a higher poverty incidence but also a wider breadth of poverty. Whereas multidimensionally poor households in the rest of the city are deprived on average in 3.5 indicators, within the *villas*, the average number of deprivations is 4.3. The combined effect of greater poverty incidence and intensity in the informal settlements yields an adjusted headcount  $M_0$  equal to 0.452 in the *villas*, approximately ten times higher than for the rest of the city. This means that the households living in the city's informal settlements experience nearly half of all of deprivations that households could experience if all households were deprived in all dimensions.

To evaluate the robustness of the results to variations in the poverty threshold, Figure 4 presents the values of H, A and  $M_0$  for values of k ranging from 10% to 90%. The

dotted lines show the 95% confidence interval for each poverty estimate. The results indicate that for values of  $k$  ranging from 10% to 80% the multidimensional headcount  $H$  is higher in the *villas* than in the rest of the city and the difference is statistically significant at the 5% level. When  $k$  is set equal to 10% nearly all of the households in the *villas* are identified as multidimensionally poor compared with 51% of households in the rest of the city. When  $k$  is set equal to 25%, which means that households must be deprived in at least one full dimension, the poverty headcount is 91% in the *villas* and 24% in the rest of the city. When  $k$  is set at 50% (two full dimensions) the headcount is 46% in the *villas* and only 4% in the rest of the city. In the case of poverty intensity ( $A$ ), the *villa*-rest of the city difference is statistically significant for values of  $k$  less than or equal to 50%. Finally,  $M_0$  is higher for households in *villas* than in the rest of the city over the full range of values of  $k$  and the difference is particularly large for values of  $k \leq 50\%$ . From this analysis we can conclude that the large territorial gap in multidimensional poverty is relatively insensitive to the selection of the poverty threshold.<sup>20</sup>

**Figure 4: Alkire-Foster measures with variation in  $k$**



Notes: Calculations based on DGEyC, 2016). Dotted lines show 95% confidence intervals.

We conclude the analysis of multidimensional poverty by comparing “censored” deprivation rates for each of the indicators included in our Alkire-Foster measure. A censored headcount measures the percentage of households that are both multidimensional poor and deprived in a given indicator. The results show that there are certain aspects of multidimensional poverty that are found almost exclusively within the city’s informal settlements. The percentage of households that are multidimensionally poor and deprived in school enrollment is around 6% inside villas and close to zero in the rest of the city. While overage enrollment occurs both inside and outside villas, its incidence is very low for the rest of the city. Overcrowding appears to be another defining feature of poverty within *villas*: 11%

<sup>20</sup> In a second test we evaluated the robustness of the results to changes in the indicator weights. Instead of employing equal weights for each dimension, we applied equal weights for each of the indicators. The results are presented in Appendix Table 1. Note that the first three columns show the original results presented in Table 2. Using equal indicator weights tends to reduce the magnitude of all three Alkire Foster measures for households both inside and outside of the *villas*.

of households inside the *villas* are poor and deprived in this aspect, while outside the *villas* this percentage drops to 0.6%.

**Table 3. Censored headcounts.**

|                        | Multidimensionally Poor |      |
|------------------------|-------------------------|------|
|                        | Villa                   | Rest |
| <b>Education</b>       |                         |      |
| Education level adults | 43.7                    | 3.5  |
| School enrollment      | 5.7                     | 0.3  |
| Overage enrollment     | 24.9                    | 1.4  |
| <b>Health</b>          |                         |      |
| Health insurance       | 83.6                    | 10.6 |
| <b>Housing</b>         |                         |      |
| Overcrowding           | 11.3                    | 0.6  |
| Housing tenancy        | 61.0                    | 2.6  |
| <b>Work</b>            |                         |      |
| Working                | 12.8                    | 2.0  |
| Work quality           | 60.2                    | 9.5  |

Notes: Calculations based on DGEyC (2016).

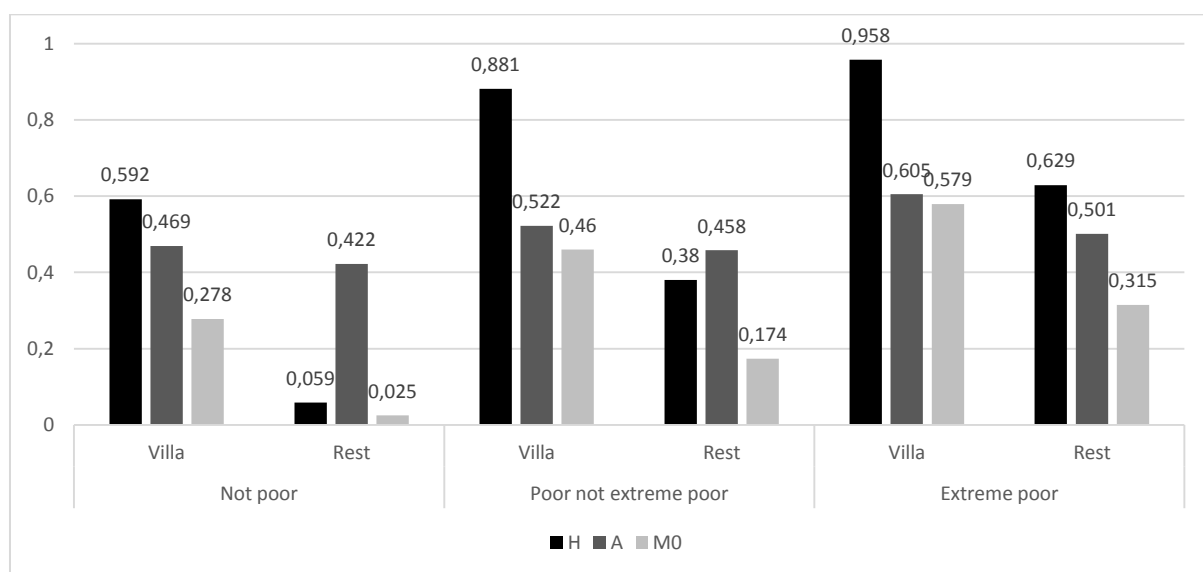
### 4.3 Comparison of income and multidimensional poverty

What is the relationship between multidimensional and income poverty? Do multidimensionally poor households also tend to be income poor, or does each criterion identify different types of households? Is the relationship between income and multidimensional poverty different in the *villas* than in the rest of the city? In this subsection we explore the relationship between the two types of poverty measures.

Figure 5 presents the decomposition of each of the Alkire-Foster measures according to the localization in *villas* and the classification of households as extremely poor, poor and nonpoor. The results suggest that extreme monetary poverty is highly correlated with multidimensional poverty inside the *villas*: almost 96% of extremely poor households are considered to be multidimensionally poor, with a poverty intensity of over 60% of the indicators. For the rest of the city, 63% of extremely poor households are also multidimensionally poor, but poverty intensity is somewhat lower (households are deprived in 50% of the indicators).

Approximately nine out of ten income poor households in the *villas* are multidimensionally poor and the poverty intensity of these households is similar to that of the extremely poor in the rest of the city (52%). Although within the *villas* the rate of multidimensional poverty is lower among the non-income poor (59%) than among the poor (above 88%), the difference in these rates is relatively less marked than when comparing the two groups in the rest of the city. Outside of the *villas*, 46% of income poor households are multidimensionally poor compared with only 6% of non-income poor households and the difference is even more evident when comparing the values of the adjusted headcount measure,  $M_0$ . This finding suggests that there is a somewhat closer association between income poverty and multidimensional poverty in the rest of the city than within the informal neighborhoods.

**Figure 5: Alkire-Foster measures by  
localization in *villas* and poverty group classification**

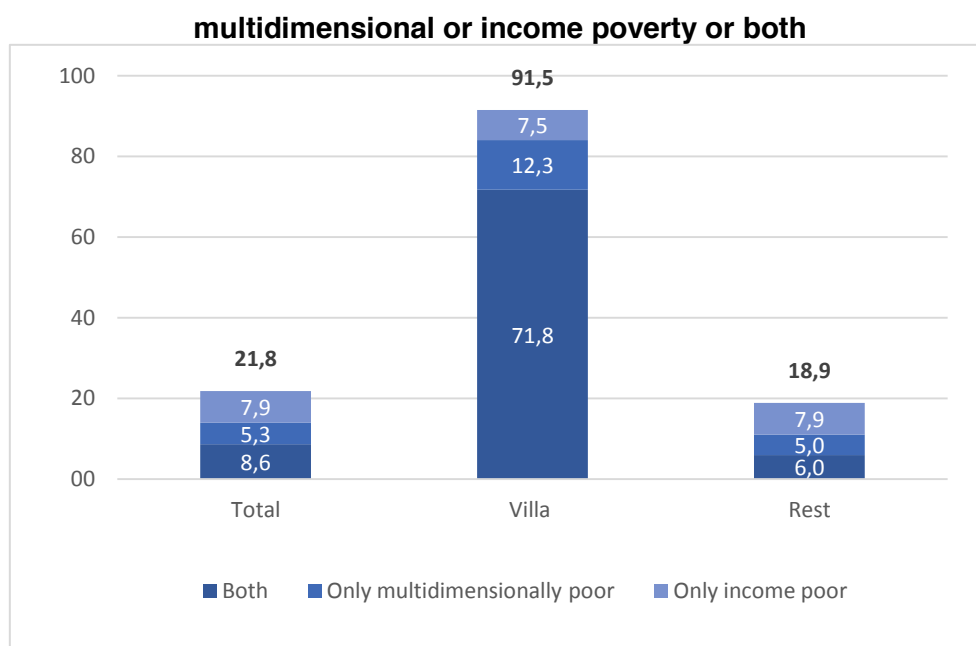


Notes: Calculations based on DGEyC, 2016.

Another relevant result of this analysis is that non-income poor households living in the *villas* are more likely to be identified as multidimensionally poor (59%) than income-poor households outside of the *villas*. That is, the critical accumulation of deprivations is more prevalent among those who do not experience monetary restrictions but live in a *villa* than for the income poor who are integrated into the city.

Another way to analyze the relationship between income and multidimensional poverty is to consider what fraction of households in *villas* and in the rest of the city experience either income or multidimensional poverty or both (Figure 6). In the *villas* 72% of households are poor according to both criteria, meaning that they do not have sufficient income *and* also accumulate multiple deprivations. On the other hand, 12% of households in the *villas* have income above the poverty line, but are classified as multidimensionally poor and 7.5% of households do not accumulate sufficient deprivations to be considered multidimensionally poor but have income below the poverty line. If we consider both poverty identification criteria, 92% of households in the *villas* can be considered to live in poverty.

**Figure 6: Percentage of households with either**



Notes: Calculations based on EAH 2016, DGEyC.

In the rest of the City of Buenos Aires 6% of households are poor according to both criteria, 5% are only multidimensionally poor and 8% are only income poor. This means that nearly 1 in 5 households can be considered to experience some form of poverty.

The complementary use of both income and multidimensional poverty criteria provides for a more complete analysis of poverty in informal settlements. The estimation of poverty based only on a monetary measure would lead to 12% of households to be incorrectly considered to be nonpoor. Outside of the *villas* the percentage of “missing” multidimensional poor is substantially lower (5%) as households living in the rest of the city accumulate fewer deprivations.

#### 4.4 Combined headcount ratios by demographic characteristics

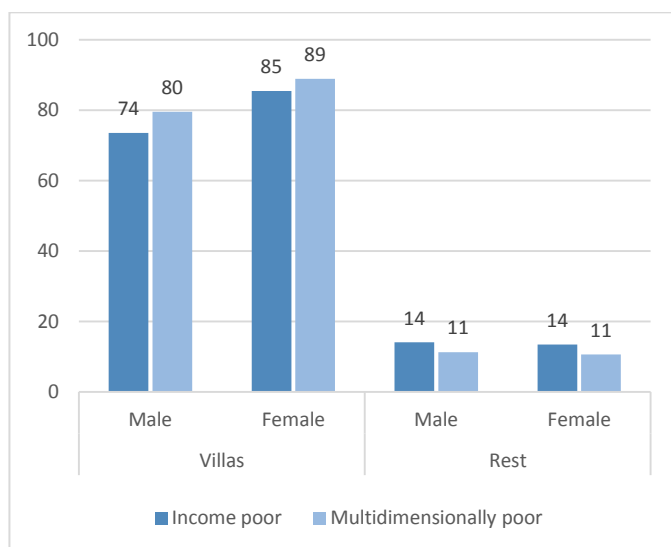
Following Suppa (2016), in this section we analyze the incidence of poverty for different sociodemographic groups, using the income-based as well as the multidimensional measures. While Suppa finds both measures provide similar results for socio-demographical risk factors, for some characteristics we obtain additional insights on the differences in poverty inside and outside *villas* by using a complementarity analysis of both income and multidimensional measures.

Outside of the *villas*, the gender of the household head is not associated with a higher incidence of either income or multidimensional poverty. Inside the *villas*, gender differences are relevant: the incidence of both types of poverty is 10 percentage points higher for female headed households than for male headed households. The age of the household's head is relevant both inside and outside the *villas*: the older the household head, the lower the poverty rate. Moreover, inside the *villas*, households headed by elderly persons (65 or older) show significantly higher rates multidimensional poverty than monetary poverty, suggesting that while access to a pension income may help reduce monetary deprivation, other forms of deprivation persist. While outside of the *villas*, the migratory status of the household head is strongly associated with both income and multidimensional poverty, inside the *villas*, where foreigners are more prevalent, the association is weaker.

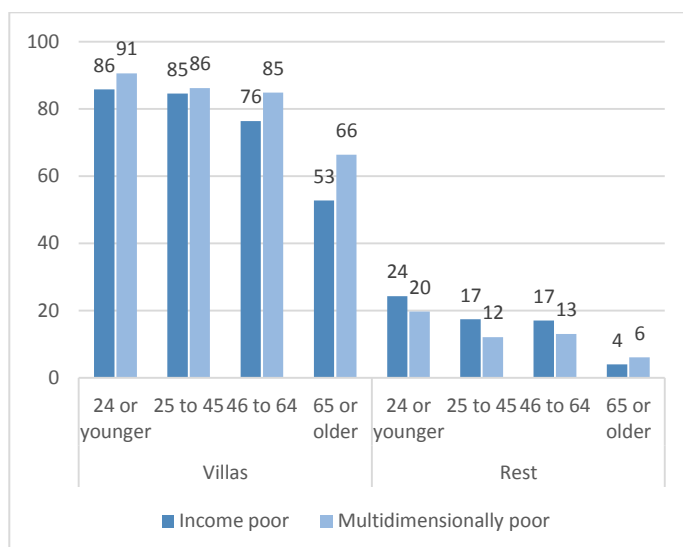
Families with 5 or more members are more likely than smaller families to experience both income and multidimensional poverty regardless of the territorial location. However, outside of the *villas*, the association between income poverty and household size is particularly strong: large households are four times more likely to be income poor than households with less than 5 members. This result is related to the way in which deprivation is operationalized at the household level when measuring poverty based on resources (income) versus capabilities (multidimensionally), an issue addressed by Sen (2000). The indicators we have used to measure multidimensional poverty are blind to the scale of deprivation of the household. For instance, a household is considered to be deprived when at least one school age child does not attend school, but if more than one child is out of school, the degree of deprivation remains the same. The monetary measure of poverty is more sensitive to household scale, more effectively identifying households that experience a strain on earnings due to their large size.

**Figure 5: Headcount ratios according to demographic characteristics of the households**

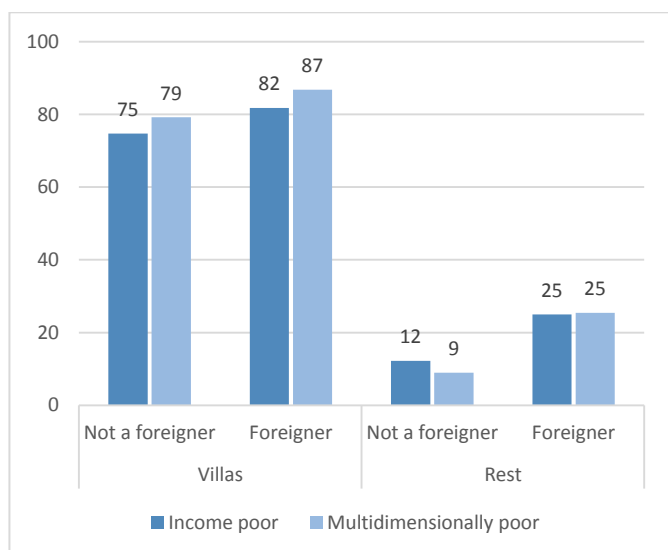
**Sex of household's head**



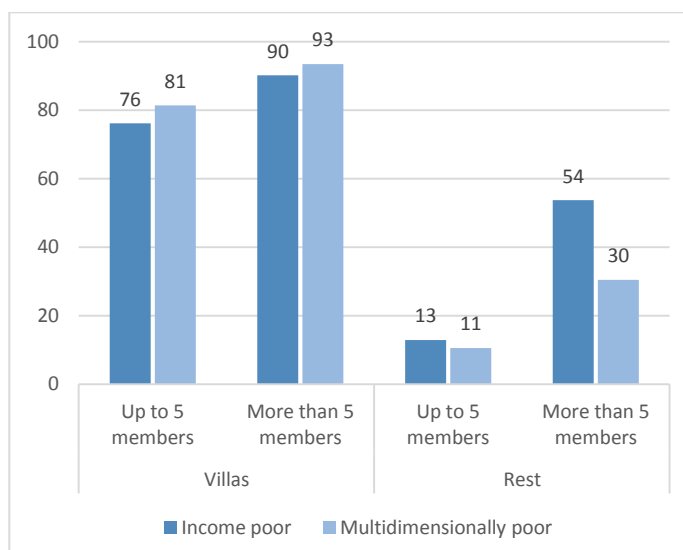
**Age of household's head**



**Migratory condition of household's head**

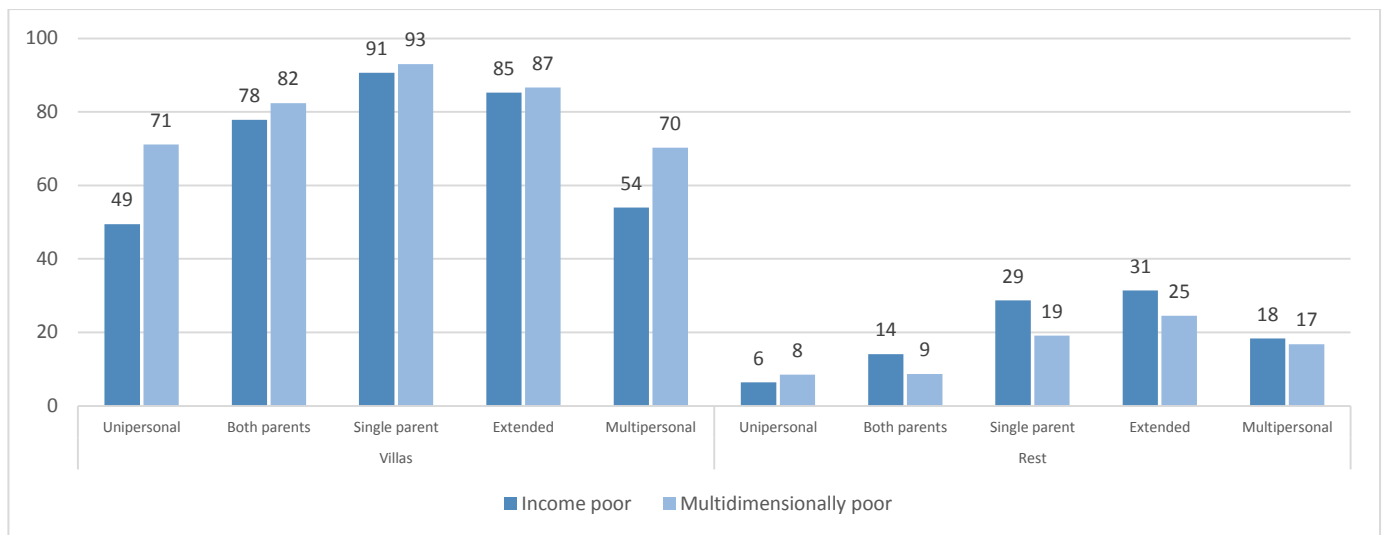


**Size of household**



**Household type**





Finally, whereas within the *villas* single parent households suffer are those which suffer the highest levels of poverty, in the rest of the city, the household type with the highest level of poverty is extended families. It is also interesting to note that whereas both income and multidimensional poverty are high among single parent households living in the *villas*, outside the *villas*, income poverty is 10 percentage points higher among these households than multidimensional poverty. Single parent households, have fewer active members than other types of households, making incomes especially low relative to expenditure needs, although the household may not be deprived in other dimensions.

## 5. Conclusions

This paper uses two leading methods of poverty measurement to assess poverty in the City of Buenos Aires, with a focus on the gap in poverty between households located in informal settlements and the rest of the city. This analysis is possible due to the availability of statistically representative household survey data for *villas* from the city government's Annual Household Survey (DGEyC, 2016a).

The analysis demonstrates that two realities coexist in the City of Buenos Aires. The use of the traditional income-based poverty measure shows notably high levels of extreme poverty (25%) and poverty (79%) in the *villas*, whereas, in the rest of the city, extreme poverty (3%) and poverty (14%) is comparatively low. The use of a multidimensional measure based on the Alkire-Foster method shows that 84% of households in *villas* are multidimensionally poor compared with 11% in the rest of the city. Moreover, multidimensionally poor households located in *villas* accumulate a higher proportion of deprivations. These results are robust to changes in the multidimensional poverty threshold. The analysis of censored headcounts shows that some types of deprivation are almost exclusively observed in *villas*, such as the deficit in school enrollment and overcrowded housing.

When we decompose deprivation rates in the indicators selected for the Alkire-Foster measure by monetary poverty, we find that deprivations in education and work are the dimensions most closely associated to income poverty. Also, for all of the dimensions except work, the incidence of deprivation in the respective indicators is markedly higher within the *villas* than in the rest of the city *within* the subgroups of households classified as extremely poor and poor.

The complementary analysis between income and multidimensional poverty suggests that there is a somewhat closer association between income and multidimensional poverty in the rest of the city than in informal settlements. Outside of the *villas*, the incidence of multidimensional poverty is five times higher among income poor households (nearly half) than among non-income poor households (one in twenty). In the *villas*, where multidimensional poverty affects the majority of households, there is a far less marked difference in the rate of multidimensional poverty among the income poor (nine out of ten) than among the non-income poor (6 out of ten). This suggests that restricting poverty analysis to income-based measures leads to a relatively greater underestimation of deprivation in the informal than in the formal sectors of the city.

Following Suppa (2016) we analyzed the risk factors associated with each type of poverty. Unlike this author's results, we find that multidimensional poverty measurement identifies as poor households with different types of characteristics than income poverty measurement, particularly when the location of households within a *villa* is considered. On the one hand households headed by the elderly are more likely to be multidimensionally poor than income poor. On the other hand, there is a stronger association between the income-based measure and large household size. Multidimensional poverty is also relatively higher among nonfamily households, while monetary poverty is most prevalent among single parent households. These findings suggest that complementing income poverty measures

with multidimensional measures could lead to more effective targeting of poverty alleviation policies.

The City of Buenos Aires, like the national government, has for many years focused primarily on monetary transfers as the main social policy for tackling poverty. More recently, the Government of the CBA has adopted new policies to integrate informal neighborhoods into the city. The results of this paper suggest the adoption of a complementary analysis between income and multidimensional poverty could provide a better framework for diagnosis and policy orientation. It is important to emphasize, however, that the adequate measurement of multidimensional poverty requires the availability of data for measuring the diverse dimensions of wellbeing.

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## Appendix A

**Table A1: Robustness test on indicator weights**

|   | Equal dimension weights<br>(k=37,5%) |                  |                  | Equal indicator weights<br>(k=37,5%) |                  |                  |
|---|--------------------------------------|------------------|------------------|--------------------------------------|------------------|------------------|
|   | Total                                | Villa            | Rest             | Total                                | Villa            | No Rest          |
| Headcount (H)                           | 0.140<br>(0.005)                     | 0.841<br>(0.02)  | 0.110<br>(0.005) | 0.104<br>(0.004)                     | 0.722<br>(0.026) | 0.078<br>(0.004) |
| Intensity (A)                           | 0.470<br>(0.004)                     | 0.538<br>(0.009) | 0.448<br>(0.004) | 0.433<br>(0.004)                     | 0.487<br>(0.01)  | 0.412<br>(0.004) |
| Adjusted Headcount<br>(M <sub>0</sub> ) | 0.066<br>(0.002)                     | 0.452<br>(0.013) | 0.049<br>(0.002) | 0.045<br>(0.002)                     | 0.351<br>(0.015) | 0.032<br>(0.002) |
| n                                       | 5998                                 | 456              | 5542             | 5998                                 | 456              | 5542             |