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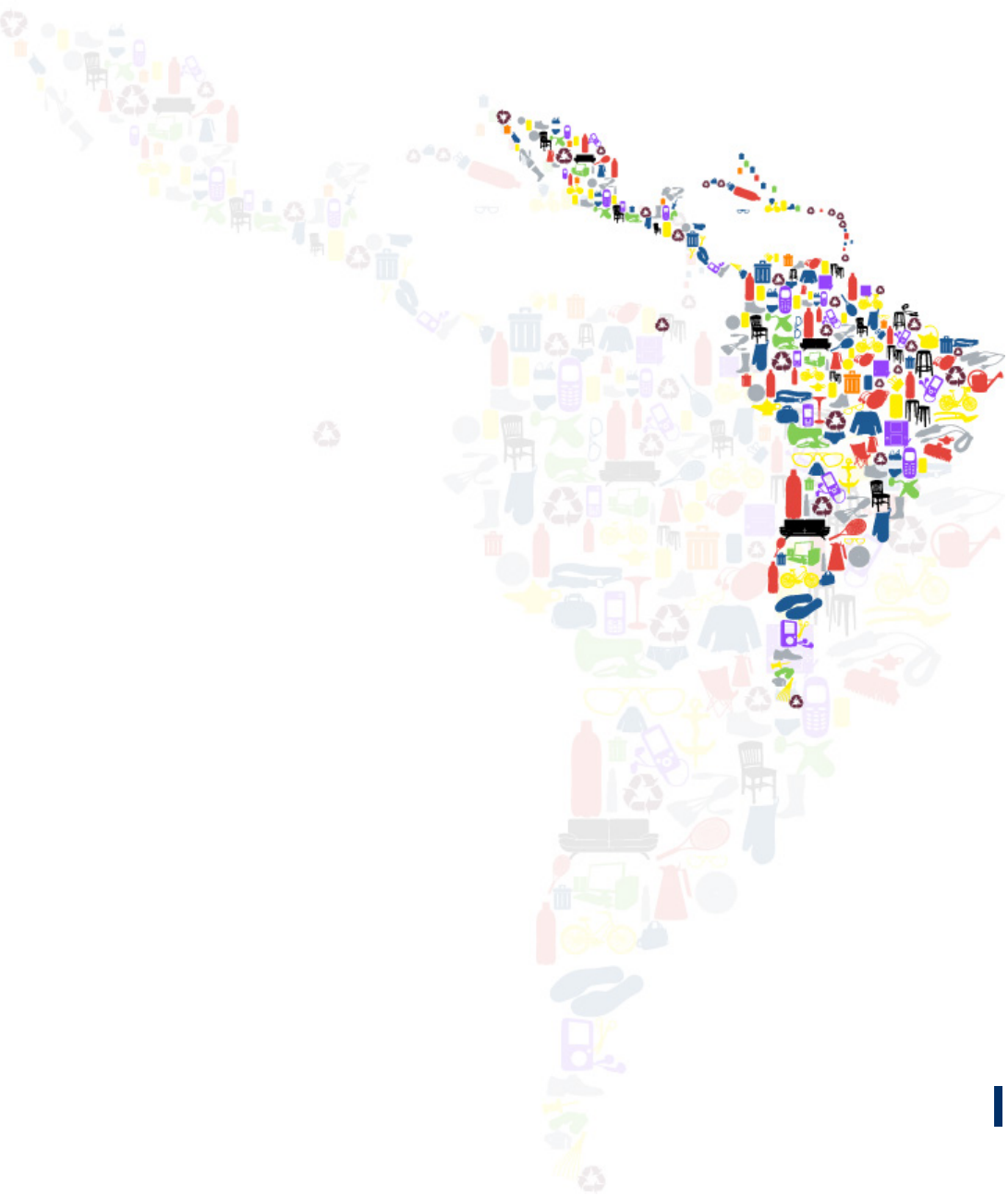
Clean and Inclusive Cities in Argentina

November 2016



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Korea Green Growth Partnership

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. ABBREVIATIONS AND ACRONYMS

AIDIS	Inter-American Association of Sanitary and Environmental Engineering
CEAMSE	Ecological Coordination Metropolitan Area State Society ('Coordinación Ecológica Área Metropolitana Sociedad del Estado')
CORMECOR	Intercommunal Corporation for the Sustainable Management of Urban Solid Waste of the Metropolitan Area of Cordoba ('La Corporación Intercomunal para la Gestión Sustentable de los Residuos Sólidos Urbanos del Área Metropolitana de Córdoba')
EAHU	Annual Survey of Urban Households ('Encuesta Anual de Hogares Urbanos')
EDSA	Survey of Argentina´s Social Debt ('Encuesta de la Deuda Social Argentina')
EPH	Permanent Survey of Households ('Encuesta Permanente de Hogares')
EVAL	Regional Evaluation of Municipal Solid Waste Management in Latin America and the Caribbean
IADB	Inter-American Development Bank
INDEC	The National Institute of Statistics and Census ('Instituto Nacional de Estadistica y Censos')
IOM	International Organization for Migration
PAHO	Pan American Health Organization
MAyDS	Ministry of the Environment and Sustainable Development ('Ministerio de Ambiente y Desarrollo Sustentable') formerly SAyDS ('Secretaria de Ambiente y Desarrollo Sustentable')
UCA	Argentine Catholic University ('Universidad Católica Argentina')
UNICEF	United Nations Children's Emergency Fund

Summary

Cities and their agglomeration economies are an important engine for growth in Argentina. Argentina is a country of cities, with over 90 percent of its population living in urban areas. Although highly diverse, Argentine cities have a common denominator: they all play a key role in fostering Argentina's sustainable economic growth and the improving living standards of its population, especially the most vulnerable. Not only do the country's urban agglomerations benefit economically from the spatial concentration of people and firms, but they also generate economy by concentrating ideas, talent, and knowledge. However, to fully leverage the potential benefits of these agglomerations, the "congestion effects" caused by urbanization, including the associated impacts on aesthetics, insecurity, air pollution, and failures in land and labor markets, among others, need to be managed and contained.[1]

The cleanliness of a city is the backdrop for urban agglomeration economies. One of the common "congestion effects" of urban agglomerations worldwide has been the sight of city streets, buildings, public spaces, residential and commercial areas strewn with litter, graffiti, uncollected waste and other signs of poor maintenance. As the backdrop to most all economic and residential activities in the city, ineffective services and the perception of a uncleanly, disordered environment can have a subtle but systemic impact on the functioning of the city and its individual neighborhoods affecting their livability, property values, and attractiveness for businesses and tourism. It also can reduce a population's sense of security and confidence in their neighbors and local government and contribute to a process of community decline in the medium and long term[2]. This can be particularly impactful in the context of the multitude of challenges faced by marginalized and informal neighborhoods.

Urban growth has also created an unacceptable informal waste economy for the most marginalized. Urban agglomerations and the resulting proximity of industries to residential and commercial sources of waste have also created a market for recycling that, because of a lack of a modernized waste sector, has developed into a large informal economy. It is estimated that currently over 4,000,000 people in Latin America work in the informal waste sector collecting recyclable materials from the streets and from open dumpsites, often times living and working under difficult conditions and with low incomes. In many cases because of the combination of easy entry into the livelihood and poor working conditions, informal recycling functions as an unacceptable social safety net for the most marginalized people including the unemployed, addicts and commonly children.

[1]Adapted from "Leveraging the Potential of Argentine Cities, A Framework for Policy Action", World Bank (2016) which was undertaken in conjunction with this diagnostic. The study identified three main challenges to take full advantage of the benefits of agglomeration economies: (1) moving toward a more balanced regional development; (2) transitioning from local to global cities; and (3) transitioning from urban sprawl to articulated densities.

[2]Litter, lack of cleanliness and other physical disorder creates a perception of lawlessness and that there is a lack of guardianship which in the case of opportunistic crime can affect the perception of opportunity of the offender and sense of security felt by the suitable victim.(Cullen 2010; Wilcox et al. 2003; Cohen and Felson). The impact of physical disorder such as litter on community decline is based on the Broken Window theory (J. Q. Wilson, G. L. Kelling, 1982) which suggests that signs of disorderly and petty criminal behavior trigger more disorderly and petty criminal behavior, thus causing the behavior to spread. This may cause a development sequence in a neighborhood leading in the medium and long term to decay and deterioration of the quality of life of its inhabitants.

Municipalities bear the responsibility for clean urban areas. Solid waste management services, cleaning and beautification are the responsibility of municipalities in much of the world and Argentina is no exception. It is one of the most important urban services provided at the municipal level, affecting citizen's daily lives and for many is representative of the ability of their municipal government to manage the urban area. However, the service is often times the least modernized of municipal services and the most costly; and municipalities are challenged to provide these services to the entire population while building the citizen participation necessary to sustain a clean community.

Clean and Inclusive Cities in Argentina

This document reviews the existing information on solid waste management and city cleanliness to understand how the country's municipalities are responding to this important challenge and how these services are supporting the growing urban agglomerations in the country. The review provides data by urban agglomeration but also includes data at the provincial and national level. It considers not only the service coverage and infrastructure but the role they play in a range of issues including the proximity of waste to people's homes, inequality of access to services, and the impact on municipal budgets. Informality, both in terms of informal employment in the waste sector and the ability of municipal services to reach informal and precarious urban settlements, is also considered. The review is intended as a compilation of data for use by local and national governments, international organizations, academics and non-governmental organizations in their ongoing efforts to improve cities. The data presented highlights the current service gaps and opportunities that can be explored to avoid the costs of congestion in order maximize Argentina's cities' role as an engine for inclusive growth.

Some of the important conclusions are:

Solid waste management and city cleaning services have among the lowest service coverage relative to other basic services. Nationally, over 4 million people (10.1 percent) do not have regular waste collection service, 7.3 million (18.4 percent) do not have street sweeping service and 19.8 million people (46.5 percent) do not have disposal service in sanitary landfills. This is a significantly larger deficit than other basic services in Argentina[3].

The service gap is acute in informal and precarious settlements. Low income populations living in informal and precarious urban settlements are suffering the most from deficiencies in waste management service. 58.6 percent of households in informal or precarious urban settlements consider open dumpsites a problem in their neighborhood and 17.9 percent do not have waste collection service.

There is a high level of informal employment. Nationally, an estimated 323,354 people work in services related to solid waste and city cleaning and 117,698, or 36 percent, are people working informally, predominantly collecting, sorting and selling recyclable materials.

Municipalities spend a significant amount on solid waste and cleaning services. Municipalities, on average, spend 13 percent of their budget on solid waste and city cleaning services. Tariffs have been established in some municipalities which, on average, cover

[3] Estimated service deficits in Argentina based on available information are: Water supply: 829,000 people without access (2%); Sanitation: 1,658,000 people with access (4%); Electricity: 580,000 people without access (1%)

30 percent of the budget for these services. These tariffs, on average, can be collected from only 50 percent of the people benefitting from the service.

Service coverage is higher in urban agglomerations. Urban agglomerations have been able to provide solid waste management and city cleaning services to a large proportion of the population, with 95.7 percent of the population benefitting from regular collection service (verses 89.1 percent nationally) and 77 percent of the population benefitting from sanitary landfill disposal service (verses 53.5 percent nationally).

The urban agglomerations in the northern part of the country more commonly have gaps in service provision. On average waste collection service is lower in the urban agglomerations in the Northeast (90.9 percent versus 95.7 in all urban agglomerations nationally) with Formosa having the lowest, servicing 77.1 percent of the population. Similarly, five urban agglomerations in the northern part of the country (Jujuy-Palpala, Greater Resistencia, Santiago del Estero-La Banda, Greater Catamarca, and Corrientes) do not have a sanitary landfill.

Greater Buenos Aires contains the highest absolute number of people affected by poor solid waste management. One third of the population in the country without regular waste collection service (633,622 people) live in Greater Buenos Aires. In addition, there are 1,453,749 people in Greater Buenos Aires living within three blocks of an open dumpsite.

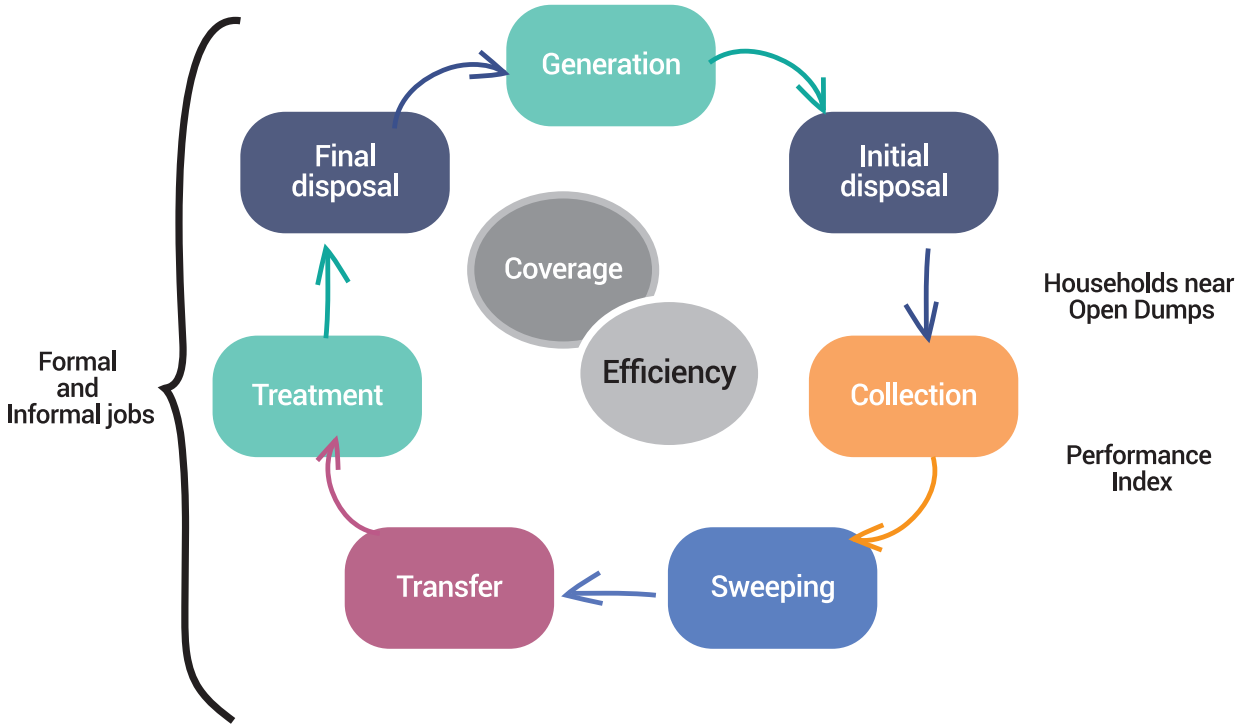
There are higher levels of informal employment in urban agglomerations. Within the 31 main urban agglomerations in the country, an estimated 60 percent (61,977 people) of those working in solid waste and city cleaning related services are working informally. Outside of urban agglomerations it is estimated that 25 percent of the employment related to these services is informal.

Regionalized services are being established to take advantage of the economies of scale provided in urban agglomerations. Regional landfills and waste transfer stations, which aggregate the waste from multiple municipalities to take advantage of the economies of scale of these services, have been developed in several urban agglomerations. There are waste transfer stations in 6 of the 31 main urban agglomerations and an estimated 31.4 percent of the waste generated in the 31 main agglomerations is being processed through a waste transfer station. Regional sanitary landfills have been setup in some urban agglomerations using various management arrangements including in Greater Salta; Greater Tucuman, Rawson-Trelew, Greater Cordoba, Greater Buenos Aires, Misiones and Greater Rosario.

Methodology

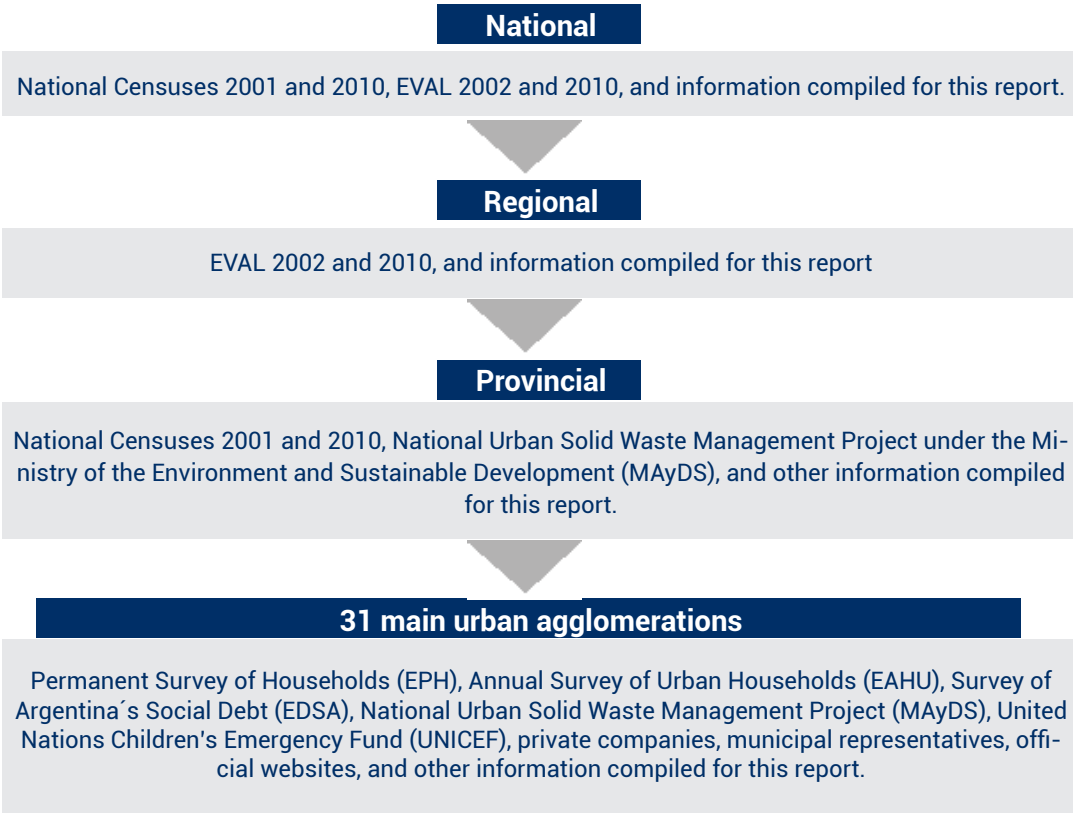
In the following chapters, a diagnostic of municipal solid waste management and cleansing services in Argentina is presented. As summarized in Figure 1, solid waste management was analyzed in an integrated manner, evaluating waste collection, sweeping, waste transfer, waste treatment, and final disposal services. For each of these elements, whenever information was available, indicators of service coverage and efficiency were analyzed. In addition, the report includes an analysis of: (a) data on the quantity of households living near open dumpsites; (b) a measurement of performance for solid waste management implemented in a sample of municipalities; (c) costs of services; and (d) data on the number of formal and informal jobs created by the solid waste sector. Points (a) and (b) help evaluate the efficiency of the service, and points (c) and (d) shed light on the finance and economics of the services and their relationship to informal employment.

Figure 1.
Analytical Framework Used



The report includes data from publicly available sources of information on solid waste management in Argentina, and also provides new or updated indicators based on available information. Additional data was also collected specifically for this report when no updated and consolidated source of information was available. The report includes national, regional, provincial, and municipal level data and makes comparisons to averages of the Latin America and the Caribbean Region. Figure 2 summarizes the main sources of information used for each of these different levels of analysis.

Figure 2.
Main Sources of Information, by Level of Analysis



National Census: The National Institute of Statistics and Censuses (INDEC) conducted the National Census of Population, Households, and Housing in both 2001 and 2010.The scope of the census is the whole country, including every urban and rural household. It measures the service by "segment" which is a unit that represents the geographic area that was assigned to a census worker and aggregates the data by region within Argentina, province, department (the political subdivision below the province) or 'partido' (the political subdivision in the Province of Buenos Aires). Data on waste collection from the National Census in 2001 and 2010 are used in this report.

Regional Evaluation of Municipal Solid Waste Management in Latin America and the Caribbean (EVAL): In 2010, the Inter-American Development Bank (IADB), in association with the Inter-American Association of Sanitary and Environmental Engineering (AIDIS), carried out a Regional Evaluation of Municipal Solid Waste Management (EVAL) based on surveys of municipal representatives from a sample of municipalities, providing average results for the Latin America and Caribbean Region and also provided results by country including information by region and size of municipality. In 2002, the IADB and the Pan-American Health Organization (PAHO) published a similar evaluation with data collected in 2001. In 2013, the IADB also published a technical note on waste management in Argentina with more specific information for the country based on the data collected in the previous reports. The chosen regions in these reports were different than those used by INDEC:

Region I: *North (Provinces of Catamarca, Chaco, Formosa, Jujuy, La Rioja, Salta, Santiago del Estero, and Tucumán);*

Region II: *Cuyo and Mesopotamia (Provinces of Corrientes, Entre Ríos, Mendoza, Misiones, San Juan, and San Luis);*

Region III: *Central and Patagonia (Provinces of Buenos Aires, Córdoba, Chubut, La Pampa, Neuquén, Río Negro, Santa Cruz, Santa Fe, Tierra del Fuego, and the City of Buenos Aires)*

Data on waste collection, street sweeping and urban cleaning, waste transfer, waste disposal, and jobs generated by the solid waste management sector from these sources are used in this report.

Permanent Survey of Households (Encuesta Permanente de Hogares, EPH): The Permanent Survey of Households (EPH) is undertaken every quarter by INDEC. It includes data from the 31 main urban agglomerations comprising the provincial capitals and urban agglomerations with more than 100,000 inhabitants. Data from between 2010 and 2014 on waste collection, overall population, and population living near dumpsites from the Permanent Survey of Households are used in this report.

Annual Survey of Households (Encuesta Anual de Hogares Urbanos, EAHU): In addition to the Permanent Survey of Households (EPH), INDEC carries out an Annual Survey of Urban Households (EAHU) which covers households in all urban municipalities with more than 2,000 inhabitants. Data from between 2010 and 2013 on population living near dumpsites from the Annual Survey of Urban Households are used in this report.

Survey of Argentina's Social Debt (Encuesta de la Deuda Social Argentina, EDSA): This is a survey undertaken by the Argentine Catholic University (UCA) that focuses on urban households. The latest survey covered the metropolitan area of Buenos Aires and 16 other urban agglomerations with a sample size of 5,700 households. Data from between 2010 and 2015 on waste collection and population living near dumpsites from the Survey of Argentina's Social Debt are used in this report.

National Urban Solid Waste Management Project (MAyDS): The National Urban Solid Waste Management Project of the Ministry of Environment and Sustainable Development (MAyDS) was a World Bank financed project executed between 2006 and 2015 that provided support to the solid waste planning and investment program in Argentina. As part of the Project, data was collected nationally and in targeted municipalities. The data collection efforts included, most significantly, the implementation of a detailed methodology to assess the costs of waste management services at the municipal level; a detailed socioeconomic evaluation; and a comprehensive performance evaluation of municipalities. Data on waste collection, waste transfer, waste treatment, waste disposal, municipal performance in solid waste management, jobs generated by the solid waste management sector and costs of solid waste management services from the National Urban Solid Waste Management Project are used in this report. The data collected originated from between 2012 and 2015.

Municipalities, Private Companies, Official Websites and Publically Available Sources. To supplement, confirm and update the data available through secondary sources, information was obtained directly through municipalities and private companies and through a variety of publically available resources on the internet. Data on waste collection, waste transfer, waste treatment and waste disposal from these sources are used in this report.The information was collected in 2015.

Solid Waste Studies and Plans: Many provinces and municipalities undertake solid waste planning studies or project design studies as part of the process of establishing and improving their solid waste system. In addition, a National Plan was developed in 2005 and updated in 2012. Data on waste treatment and jobs generated by the solid waste management sector from these sources are used in this report. The majority of plans were published between 2010 and 2014.

Child Labor in the Recovery and Recycling of Solid Waste: In 2006, the International Organization for Migration (IOM) and the United Nations Children's Emergency Fund (UNICEF) published a report on child labor in the recovery and recycling of solid waste. The report provides data on the City of Buenos Aires, the Department ('partido') of Moreno (Buenos Aires Province), and Posadas (Misiones Province) in the year 2004. The number of children and teenage workers includes those that could counted during the time period of the survey. Data on jobs generated by the solid waste management sector and separation plants from this source are used in this report.

1. ***Waste collection services***

1. Waste collection services

The country has high levels of waste collection service coverage in urban areas. 94.8 percent of households in urban areas and 95.7 percent of those in the 31 main urban agglomerations have waste collection service at least twice a week. In terms of absolute numbers, however the deficit in service is significant.1,868,411 people in urban areas do not have this service, and 33 percent of this unserved population is located in Greater Buenos Aires.

89.9 percent of the population in urban and rural areas have waste collection service at least twice a week. A total of 4,004,221 people do not have this service including 2,135,810 people in rural areas.

Between 2001 and 2010, the expansion of waste collection service kept pace with population growth. An additional 3.9 million people were provided waste collection service at least twice a week during this time period. As this increase was comparable to the overall population growth, there was not a substantial increase in the proportion of the population provided with this service (it was 89.7 percent in 2001 and 89.9 percent in 2010).

Waste collection service coverage in urban areas is significantly lower in informal or precarious urban settlements. Among urban households located in informal or precarious urban settlements, 17.9 percent of households did not have waste collection service at least every other day. This service deficit is four times higher than that for the general urban population.

The percentage of urban households without waste collection service increases significantly in low income populations. A higher proportion of urban households that are marginal working class (8.7 percent do not have service) and in houses where the head of household is unemployed or underemployed (7.8 percent) do not have waste collection service at least every other day.The deficit for this service for both households in the medium-high socioeconomic strat and with a professional head of household is 1.2 percent.

There are inequalities in waste collection service in urban areas. The proportion of households with waste collection service at least twice a week in urban areas is lower in the Northeast provinces (90.9 percent on average), with the lowest service coverage found in Formosa (77.1 percent). Among the 31 main urban agglomerations, Santa Rosa-Toay has the highest proportion of households with waste collection service at least twice a week (98.9 percent) and Greater Resistencia has the lowest (88.7 percent).

Provinces in the Northeast achieved the most significant improvements in overall waste collection service between 2001 and 2010. In 2001, the provinces of Chaco, Corrientes, Formosa and Misiones had the lowest overall (including urban and rural) proportion of households with waste collection service at least twice a week. By 2010, the service coverage in these provinces increased, covering an additional 5.1 to 7.3 percent of the population.

Deficiencies in equipment are worse in the Northern Region and in smaller municipalities. Nationally 45 percent of the collection vehicles are more than 10 years old, and in small municipalities (<15,000 people) this number increases to 85 percent. In addition, waste generated by 29.5 percent of population is collected with vehicles without a compactor, a number which increases to 45.8 percent in the Northern region.

Greater Buenos Aires is host to the largest population without waste collection service. One third of the population without collection service at least twice a week (633,622 people) live in Greater Buenos Aires.

76 percent of the surveyed population from six urban agglomerations are satisfied or very satisfied with their waste collection service.

1.1 **National Census 2001 and 2010**

The National Census evaluated waste collection service coverage considering that a household has service when there is a presence of regular service in a “segment” at least twice a week. A “segment" is a unit which represents the geographic area that was assigned to a census worker. The presence of waste collection service is determined by the census worker based in the predominant situation in a given segment as recorded in the survey.

The National Census reports data on solid waste collection service coverage nationwide, by province and department and in the case of Buenos Aires Province by ‘partido' (a political subdivision of Buenos Aires Province). In addition to the total number of households and inhabitants with waste collection service, the National Census provides disaggregated figures for waste collection service coverage for both urban and rural households and inhabitants. As the National Census does not report data by municipality (the administrative jurisdiction of a town or city within a department) or urban agglomeration (urban areas as defined by the Permanent Survey of Households), for the purpose of this study, figures disaggregated by urban agglomerations were developed. This was done by determining the departments that comprise each urban agglomeration and then adding the number of urban households and inhabitants provided with the service. The National Census also analyzes the characteristics of the households. In the 2001 National Census it was possible to analyze waste collection service coverage for different types of housing.

Table 1.
Waste Collection Service Coverage at least Twice a Week, 2001 and 2010, by Province and the City of Buenos Aires

Province	National Census 2001	National Census 2010			
	Total	Total		Urban Areas	
	Households with Service	Households with Service (%)	Number of people without service	Households with Service (%)	Number of people without service
Countrywide	89.7	89.9	4,004,221	94.8	1,868,411
Pampeana/Central Region					
City of Buenos Aires	99.3	97.7	64,565	97.7	64,565
24 Departments in Greater Buenos Aires	94.7	94.2	569,117	94.3	564,144
Interior of Buenos Aires Province [1]	90.9	92.9	400,377	96.2	198,918
Córdoba	91.7	93.0	227,380	97.4	76,356
La Pampa	92.1	93.7	19,957	98.5	4,064
Santa Fe	91.2	92.5	238,471	96.1	112,108
Entre Ríos	84.3	87.1	157,396	95.5	47,242
Northwest					
Jujuy	86.6	89.4	70,556	95.4	26,903
Salta	83.1	86.1	167,234	93.9	64,036
La Rioja	85.1	87.2	42,242	92.2	22,214
Catamarca	79.4	82.9	62,154	92.9	20,017
Santiago del Estero	58.8	62.5	325,823	85.9	84,164
Tucumán	78.5	80.3	284,256	91.8	94,823
Northeast					
Chaco	71.7	76.7	243,816	87.6	109,536
Corrientes	71.6	78.9	208,276	91.5	69,783
Misiones	67.1	74.3	280,104	93.6	51,806
Formosa	57.2	64.0	189,513	77.1	97,593
Cuyo					
Mendoza	86.2	88.8	193,646	96.8	44,190
San Juan	85.5	90.0	67,551	95.3	27,423
San Luis	89.4	92.1	33,966	97.0	11,413
Patagonia					
Neuquén	91.5	91.5	46,002	95.7	21,481
Río Negro	88.2	90.3	61,079	95.9	22,257
Chubut	93.8	93.4	32,883	96.0	18,363
Santa Cruz	97.8	95.7	11,514	96.5	8,929
Tierra del Fuego, Antarctica and Islands	98.4	94.9	6,343	95.1	6,083

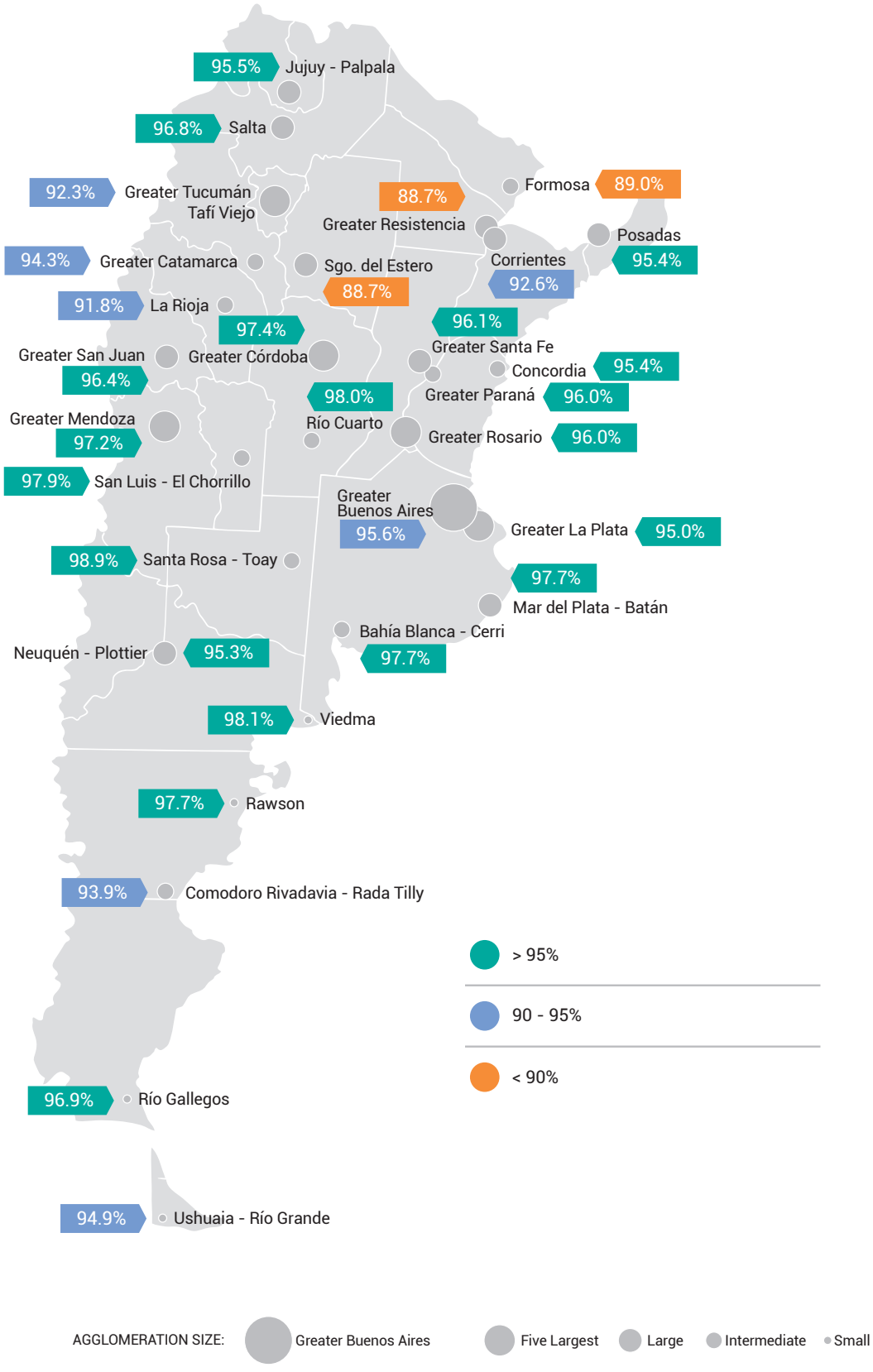
Source: Own elaboration based on National Census, 2001 and 2010.
[1] Not including the 24 departments in Greater Buenos Aires

Table 2.
Collection Service Coverage at least Twice a Week, 2010, by Urban Agglomeration

Urban Agglomeration	Population	Households with Collection Service (%)	Departments Considered in Calculation	Population with Collection Service	Population without Collection Service
Greater Buenos Aires					
Greater Buenos Aires	13,778,196	95.6	City of Buenos Aires and 24 'partidos' of Greater Buenos Aires	13,169,700	633,682
Cuyo					
Greater Mendoza	1,070,944	97.2	Mendoza Capital, Guaymallén, Las Heras, Luján de Cuyo, Godoy Cruz and Maipú	1,041,372	29,572
Greater San Juan	511,625	96.5	San Juan Capital, Rawson, Rivadavia, Chimbas, and Santa Lucía.	493,558	18,067
San Luis - El Chorrillo	215,487	97.9	San Luis Capital	211,043	4,444
Northeast					
Corrientes	379,696	92.6	Corrientes Capital	351,632	28,064
Formosa	254,702	89.0	Formosa	226,707	27,995
Greater Resistencia	407,001	88.7	San Fernando	360,994	46,007
Posadas	350,913	95.4	Posadas Capital	334,832	16,081
Northwest					
Greater Catamarca	209,072	94.3	Catamarca Capital, Valle Viajo and Fray Mamerto Esquiú	197,222	11,850
Greater Tucumán - Tafí Viejo	863,943	92.4	Tucumán Capital, Cruz Alta, Yerba Buena, Lules, Tafí Viejo	798,139	65,804
Jujuy – Palpalá	335,406	95.5	Dr. Manuel Begrano and Palpalá	320,435	14,971
La Rioja	200,933	91.8	La Rioja Capital	184,477	16,456
Salta	617,418	96.8	Salta Capital, Cerrillos and La Caldera	597,680	19,738
Santiago del Estero - La Banda	401,924	88.8	Santiago del Estero Capital and Banda	356,798	45,126
Pampeana/Central Region					
Bahía Blanca – Cerrito	305,962	97.8	Partido de Bahia Blanca	299,107	6,855
Concordia	159,631	95.4	Concordia	152,281	7,350
Greater Córdoba	1,512,823	97.4	Córdoba Capital and Colón	1,473,802	39,021
Greater La Plata	828,860	95.0	La Plata, Berisso and Ensenada	787,490	41,370
Greater Rosario	1,415,628	96.1	Rosario and San Lorenzo	1,359,660	55,968
Greater Paraná	273,300	96.0	Paraná	262,443	10,857
Greater Santa Fe	526,366	96.2	Santa Fe capital	506,337	20,029
Mar del Plata – Batán	631,322	97.8	Gral. Puayrredón	617,355	13,967
Río Cuarto	171,332	98.1	Río Cuarto	168,023	3,309
Santa Rosa – Toay	124,545	98.9	Santa Rosa Capital and Toay	123,176	1,369
San Nicolás - Villa Constitución	187,981	96.7	San Nicolás y Constitución	181,799	6,182
Patagonia					
Comodoro Rivadavia - Rada Tilly	210,875	94.0	Escalante	198,148	12,727
Neuquén – Plottier	304,572	95.4	Confluencia	290,510	14,062
Río Gallegos	108,693	97.0	Güer Aike	105,395	3,298
Ushuaia - Río Grande	143,471	94.9	Ushuaia and Río Grande	136,169	7,302
Rawson – Trelew	137,057	97.8	Rawson	133,993	3,064
Viedma - Carmen de Patagones	85,442	98.2	Patagones	83,876	1,566
TOTAL	**26,725,120**	**95.7**		**25,524,153**	**1,226,153**

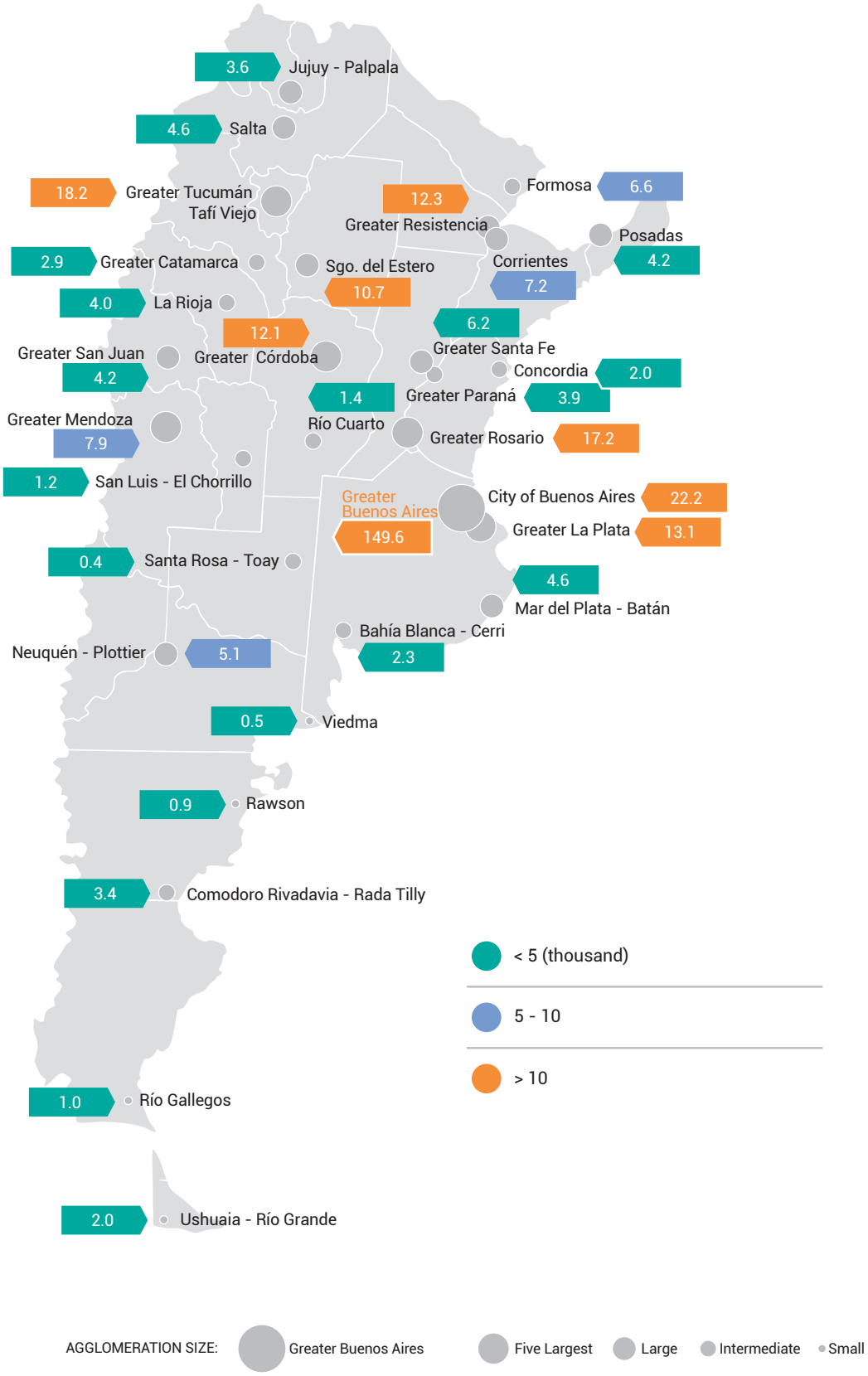
Source: Own elaboration based population and department-level data on waste collection service coverage from the National Census 2010, aggregated by urban agglomeration.

Figure 3.
Percentage of Households with Solid Waste Collection Service at least Twice a Week, 2010, by Urban Agglomeration



Source: National Census, 2010
Urban Agglomeration Categories: Greater Buenos Aires, five largest agglomerations (700,000–1.5 million), large agglomerations (300,000–700,000), intermediate agglomerations (100,000–300,000), and small agglomerations (50,000–100,000).

Figure 4.
Number of Households (in Thousands) with Solid Waste Collection Service at least Twice a Week, 2010, by Urban Agglomeration



Source: National Census, 2010
Urban Agglomeration Categories: Greater Buenos Aires, five largest agglomerations (700,000–1.5 million), large agglomerations (300,000–700,000), intermediate agglomerations (100,000–300,000), and small agglomerations (50,000–100,000).

Table 3.
Waste Collection Service at least Twice a week, 2001, by Type of Housing

Indicator	House Type A[1]	House Type B[1]	Ranch[2]	Precarious house[3]	Apartment	Rented Room in Recidence	Rented room in Hotel or Hostel	Location not Built as a Room	Mobile House	In the street
Number of households without service	356,144	409,485	141,670	57,427	11,263	3,945	405	2,761	1,777	582
% of households with waste collection service	94.0	72.2	34.6	78.3	99.1	94.4	98.1	86.0	53.5	72.4

Source: Own elaboration based on National Census, 2001.
[1] A Type B house is a house with at least one of the following conditions: has a dirt or loose brick floor (no ceramic flooring, tile, mosaic, marble, wood, carpet, concrete, or brick fixed), has no provision of piped water inside the house, or does not water discharge. A type A house do not have any of these characteristics and is not a ranch or Precarious house.
[2] A ranch generally has an adobe wall, dirt floor, and a sheet or straw roof. It is considered typical of rural areas.
[3] A precarious house is usually made out of low quality materials or waste, it is found in urban areas.

Data analysis

- The country has a high level of waste collection service coverage in urban areas, with 94.8 percent of households in urban areas having collection service at least twice a week. In the 31 main urban agglomerations it is slightly higher, reaching 95.7 percent.

- Considering not only urban, but also rural households, 89.9 percent of households in the country have waste collection service at least twice week.

- There are significant populations without service. Nationwide, 4,004,221 persons do not have waste collection service at least twice a week. When only taking into account urban households, 1,868,411 persons do not have this service and 33 percent of this unserved population lives in Greater Buenos Aires.

- Table 1 shows significant differences in waste collection service coverage among provinces. The proportion of households with waste collection service at least twice a week in urban areas is lower in the Northeast provinces, with Formosa being the lowest (77.1 percent). Similarly, service coverage is lower in these provinces when considering both urban and rural households. Chaco, Corrientes, Formosa, and Santiago del Este-ro, have a significantly lower proportion of households with waste collection service at least twice a week, ranging from 62.5 percent (Santiago del Estero) to 78.9 percent (Corrientes).

- There is no significant increase in the percentage of households with waste collection service at least twice a week (0.2 percent increase) over the period of the two National Census (2001 and 2010). However, it should be noted that the country's population grew 10.6 percent over this period. Therefore, the expansion of this waste collection service managed to keep pace with population growth. In 2001, waste collection at least

twice a week was provided to 31,695,832 people, while in 2010, 35,668,299 people were provided this service.

- Between 2001 and 2010, Misiones, Formosa, Corrientes, and Chaco, all Northeast provinces, achieved the most significant improvements (greater than 5 percent improvement) in the proportion of households with waste collection service at least twice a week. Those provinces also had the lowest proportion of households with waste collection service in 2001.

- Three Patagonian provinces (Chubut, Santa Cruz and Tierra del Fuego), the City of Buenos Aires and the 24 'partidos' of Buenos Aires Province did not manage to keep pace with the inter-census population growth. Considering both urban and rural areas, between 2001 and 2010 there was a reduction in the proportion of households with waste collection service at least twice a week.

- There are differences in the proportion of the population with access to waste collection service at least twice a week among the 31 main urban agglomerations, with Santa Rosa-Toay having the highest service coverage (98.9 percent) and Greater Resistencia having a service coverage that is more than 10 percent lower (88.7 percent). Deficiencies are concentrated in the Northeast and Northwest urban agglomerations including Formosa, Greater Resistencia, and Santiago del Estero-La Banda. These urban agglomerations also contain the provinces with highest deficit in service coverage when waste collection service coverage is analyzed by province.

- There are differences in access to waste collection service at least twice a week depending on the type of house. While 94.0 percent of "type A" houses have waste collection service at least twice a week, this number decreases to 79.0 percent for "precarious houses", 72.2 percent for "type B"' houses, and 34.6 percent for "ranches". This indicates that in precarious urban settlements, and in rural areas, where ranches are common, there is a higher percentage of households without this service.

- In the 31 main urban agglomerations over 25.5 million inhabitants have waste collection service at least twice a week.

1.2 Regional Evaluation of Municipal Solid Waste Management in Latin America and the Caribbean (EVAL)

The Regional Evaluation of Municipal Solid Waste Management (EVAL), 2010 provides information on solid waste collection services from a sample of municipalities. Results are based on surveys of municipal representatives who provide information on the percentage of inhabitants with waste collection, the average frequency, equipment types and amount and information on special services (debris collection and waste collection from markets). The data is reported nationally and by sub-region and disaggregated by size of municipality. As the survey was undertaken for the entire Latin America and the Caribbean Region it allows comparisons with averages for the Region.

Table 4.
Waste Collection Service Coverage, 2010, by Municipality Size and Region

Indicator	Region			Municipality Size				Overall	Latin America and the Caribbean Average
	I	II	III	Micro	Small	Medium	Large		
Overall waste collection service (% of population)	99.7	100	99.8	97.2	100	100	99.8	99.8	93.4
Daily waste collection service[2]	56.6	59	78.5	—	—	—	—	71.9	45.4
Waste collection service 2 to 5 times a week (% of population)	43.4	39.6	21.5	—	—	—	—	27.9	52.7
Waste collection service once a week (% of population)	0	1.4	0	—	—	—	—	0.2	1.8
Waste collection vehicles per 10,000 inhabitants	1.0	1.0	1.5	4.0	1.7	1.3	0.9	1.3	1.3
Waste collection service using vehicles less than 10 years old (% of collection vehicles)	34	55	60	15	40	52	73	55	66
Waste collection service using vehicles equipped with compactors (% of collection vehicles)	54.2	65.8	75.4	—	—	—	—	70.5	57.8
Municipalities with debris collection service (% of municipalities)	79.6	67.6	78.5	—	—	—	—	76.7	—
Municipalities with collection service in markets (% of municipalities)	79.6	45.1	56.8	—	—	—	—	61	—

Source: Own elaboration based on EVAL, 2010 and IDB Technical Note, 2013.
Region I: Provinces of Catamarca, Chaco, Formosa, Jujuy, La Rioja, Salta, Santiago del Estero, and Tucumán.
Region II: Provinces of Corrientes, Entre Ríos, Mendoza, Misiones, San Juan, and San Luis.
Region III: Provinces of Buenos Aires, Córdoba, Chubut, La Pampa, Neuquén, Río Negro, Santa Cruz, Santa Fe, Tierra del Fuego, and the City of Buenos Aires.
Municipality size: Large: 300,001 to 5,000,000 inhabitants; medium: 50,001 to 300,000 inhabitants; small: 15,001 to 50,000 inhabitants; and micro: municipalities with less than 15,000 inhabitants.

Data analysis

- Both the EVAL (2010) report and the 2010 National Census assessed the waste collection service coverage in the same year, but the numbers found by EVAL are significantly higher. They use different methodologies. The numbers presented in the 2010 National Census are based in the assessment of the census workers, who used survey results to determine the predominant situation in given census area or segment, while EVAL is based on information provided by municipal representatives for a sample of municipalities.

- Argentina has more frequent waste collection than the Latin America and Caribbean Regional average. The percentage of the population with daily waste collection service nationally (71.9 percent) is much higher than the Latin America and the Caribbean Regional average (45.4 percent).

- EVAL estimated that the country has 1.3 vehicles per 10,000 inhabitants, which is the same as the Latin America and the Caribbean Regional average.

- There are differences in waste collection service provision between regions in Argentina. Region I, has the worst indicators related to equipment and are below the averages for the Latin America and the Caribbean Region. Region III, which includes the Greater Buenos Aires Metropolitan Area, has a higher number of vehicles per 10,000 inhabitants (1.5), a newer fleet of vehicles (60 percent are less than 10 years old), and a higher number of vehicles with compactors (75.4 percent) than the other regions.

- Table 4 also shows differences among different sized municipalities. According to EVAL, the smaller the size of the municipality, the higher the number of vehicles per 10,000 inhabitants. Smaller municipalities are also less likely to have vehicles with a compactor and more likely to have old trucks.

- With 45 percent of vehicles being more than 10 years old, Argentina has an older vehicle fleet than the Latin America and the Caribbean regional average. This indicator is even worse in Region I (66 percent), and in municipalities with less than 15,000 inhabitants (85 percent).

- 29.5 percent of the population has waste collection service that does not utilize compactor trucks. Region I has the lowest numbers in this category, with almost 45.8 percent of the population being served by waste collection without compactors.

- In the country, some municipalities provide special collection services such as construction and demolition waste collection or collection services for markets. In this case, Region II has the lowest service coverage for these special services.

1.3 **Survey of Argentina's Social Debt (EDSA)**

The Survey of Argentina's Social Debt (EDSA) is performed by the 'Observatory of Argentina's Social Debt', an institutional research department in the Catholic University of Argentina (UCA). The observatory has been carrying out surveys in urban agglomerations since 2004. The survey includes Buenos Aires metropolitan area and 16 other urban agglomerations with a sample size of 5,700 households.

The section of the survey that analyzes public services takes into account waste collection. Specifically, the survey asks,"In the block where your house is situated, is there waste collection at least every other day?". Unlike the National Census, where the census worker evaluates if there is service coverage for a census area ('segment') based on survey results, or EVAL, where the municipal representative assesses total service coverage, EDSA provides direct information using individual household survey responses. The survey assesses access to the service for different socioeconomic levels and for different urban agglomerations and specifically provides service coverage levels for households located in informal or precarious urban settlements (the survey specifically mentions "villas", or slums, and precarious settlements).

Table 5.
Urban Households without Waste Collection Service Coverage at least Every Other Day, 2010-2015

	2010	2011	2012	2013	2014	2015
Total urban households						
Without waste collection service (%)	3.6	4.6	4.3	3.2	4.0	4.3
With waste collection service (%)	96.4	95.4	95.7	96.8	96.0	95.7
Urban households in informal and precarious urban settlements[1]						
Without waste collection service (%)	19.9	32.9	26.2	16.5	22.4	17.9
With waste collection service (%)	80.1	67.1	73.8	83.5	77.6	82.1

Source: EDSA-Bicentenario, 2010-2016 (data up to 2015); Observatorio de la Deuda Social Argentina, UCA.
[1]Includes both "villas" (slums) and precarious settlements.

Table 6.
Urban Households without Waste Collection Service Coverage at least Every Other Day, 2015, by Type of Urban Agglomeration, Social Stratum, and Residential Condition

	Urban Agglomeration					Social Stratum				Residential Condition		
	All urban areas	City of Buenos Aires	Greater Buenos Aires	Other metropolitan areas	Other urban areas	Very low	Low	Medium low	Medium high	Informal or precarious urban settlements[1]	With urban layout; low social strata	With urban layout; medium-high social strata
Without waste collection service (%)	4.3	0.6	5.0	5.9	4.6	9.1	4.6	2.5	1.2	17.9	7.1	1.0
With waste collection service (%)	95.7	98.6	94.9	94.1	95.4	90.9	95.4	97.5	98.8	82.1	92.9	99.0

Source: EDSA-Bicentenario, 2010-2016 (data up to 2015); Observatorio de la Deuda Social Argentina, UCA.
[1] Includes both "villas" (slums) and precarious settlements.

Table 7. Urban Households without Waste Collection Service Coverage at least Every Other Day, 2015, by Economic-Occupational Stratum and Characteristics of Head of Household

	Economic – Occupational				Head of Household							
					Gender		Education		Employment status			
	Marginal working class	Working class	Middle class	Middle class professional	Male	Female	With secondary education	Without secondary education	Regular	Precarious	Under - or Unemployed	Inactive
Without waste collection service (%)	8.7	4.9	2.7	1.2	4.5	3.9	2.3	6.5	2.7	6.3	7.8	7.3
With waste collection service (%)	91.3	95.1	97.3	98.8	95.5	96.1	97.7	93.5	97.3	93.7	92.2	92.7

Source: EDSA-Bicentenario, 2010-2016 (data up to 2015); Observatorio de la Deuda Social Argentina, UCA

Table 8. Urban Households With and Without Waste Collection Service, 2010-2015, Comparison of Results

Survey	Survey coverage	Criteria	With waste collection service (%)	Without waste collection service (%)
EDSA, 2010-2015	Selected urban agglomerations	Collection every other day	95.4-96.8	3.2-4.6
National Census, 2010	All urban areas	Collection at least twice a week	94.8	5.2
National Census, 2010	31 main urban agglomerations		95.7	4.3
EVAL, 2010	Urban areas		99.8	0.2

Source: Own elaboration based on EDSA-Bicentenario, 2010-2016 (data up to 2015); National Census, 2010 and EVAL, 2010.

Data analysis

- The proportion of households with waste collection service coverage at least every other day in selected urban agglomerations reported in EDSA between 2010 and 2015 (95.4-96.8 percent) is similar to the proportion of households with waste collection service at least once a week from the National Census in 2010 for the 31 main urban agglomerations (95.7) and for urban areas nationwide (94.8).

- For households located in informal or precarious urban settlements, the percentage of households without service at least every other day (17.9 percent) is four times higher than the average for the urban population (4.3 percent) and more than twice as high as that for households in the low socioeconomic stratum but with an urban layout (7.1 percent).

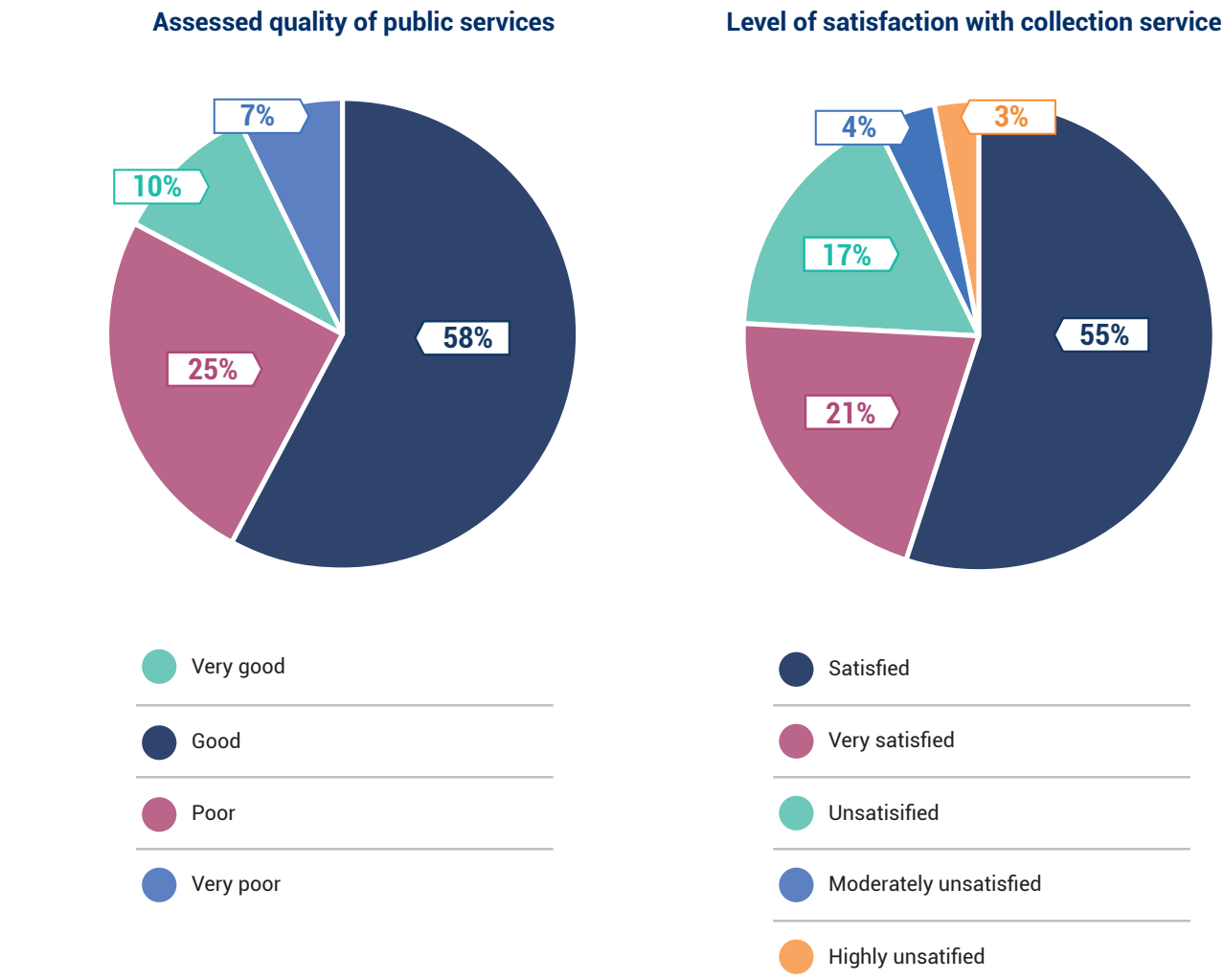
- The percentage of households without waste collection service at least every other day is higher for households that have an unemployed or underemployed head of household (7.8 percent) and in households belonging to the 'marginal working class' (8.7 percent). The percentage of households without waste collection service at least every other day is the lowest for households in the medium-high socioeconomic stratum and in houses with a professional head of household (both are 1.2 percent).

- Between 2010 and 2015, there was no improvement in the proportion of households with waste collection service coverage at least once a week for urban households or for households in informal or precarious urban settlements.

1.4 National Urban Solid Waste Management Project (MAyDS) Socioeconomic Evaluation

Under the National Urban Solid Waste Management Project of the Ministry of Environment and Sustainable Development (MAyDS), a socioeconomic survey with 3,600 respondents from six Argentine urban agglomerations was undertaken in 2014. The survey included questions about the level of satisfaction with waste collection service in particular as well as with public services in general. The selected urban agglomerations were Greater Mendoza, the 'partidos' of La Matanza and Berazategui (Greater Buenos Aires), and Rosario, where waste is collected six times a week, on average; Resistencia where waste is collected four times a week; and San Salvador de Jujuy where waste is collected three times a week.

Figure 5.
Quality of Public Services and Level of Satisfaction with Waste Collection in Selected Urban Agglomerations, 2014



Source: National Urban Solid Waste Management Project (MAyDS), Socioeconomic Evaluation Final Report, 2014

Data analysis

- 68 percent of the respondents described the quality of public services as 'good' or 'very good', while for waste collection in particular, the results show that 76 percent of those surveyed are 'satisfied' or 'very satisfied' with the service.

- 93 percent of those surveyed said that they properly dispose waste in front of their door or in the nearby container, as applicable. In addition, 68 percent said they would store waste in their house if the waste is not collected for one week. This number is higher (83 percent) in San Salvador de Jujuy and lower (49 percent) in Villa Gobernador Galvez.

2. ***Street sweeping and urban cleaning services***

2. Street sweeping and urban cleaning services

The country has high levels of street sweeping service coverage. 81.6 percent of the population benefits from street sweeping services which is close to the average for the Latin America and the Caribbean Region (82.3 percent). This corresponds to 7.3 million people without street sweeping service in 2010.

Street sweeping service coverage is particularly low in Region II (Provinces of Corrientes, Entre Ríos, Mendoza, Misiones, San Juan, and San Luis). This region has the lowest service coverage (64.3 percent versus 81.6 nationwide) while the other regions have street sweeping service coverages that are closer to the national average (83.9 percent for Region I and 84.9 percent for Region III).

Mechanized street sweeping services are also high. The proportion of the population with mechanized street sweeping service is 18.9 percent in the country, which is significantly higher than the average for the Latin America and the Caribbean Region (7.1 percent). This service exists in municipalities of all sizes with an average service coverage of 12.9 percent in thevery small municipalities; 9.3 percent in the small municipalities; 22.6 percentin the medium-sized municipalities; and 18.1 percent in the large municipalities.

The number of mechanized sweeping vehicles is high. Municipalities have an average of 0.4 mechanized vehicles per 10,000 inhabitants nationwide which is higher than the average for the Latina America and the Caribbean Region (0.2 per 10,000 inhabitants) and the percentage of vehicles that are in good working condition (87 percent) is also higher than the average for the Latin America and the Caribbean Region (81 percent). The number of mechanized sweeping vehicles also varies significantly between regions and among different sizes of municipalities.The highest values are found for municipalities with less than 15,000 inhabitants (1.0 vehicles per 10,000 habitants) and for the Northern region (0.9 vehicles per 10,000 inhabitants).

2.1 Regional Evaluation of Municipal Solid Waste Management in Latin America and the Caribbean (EVAL)

The Regional Evaluation of Municipal Solid Waste Management (EVAL) obtained data from 2001 and 2010 on street sweeping, and special urban cleaning services (parks and garden maintenance and cleaning up after fairs and exhibitions) from a sample of municipalities. Results are based on surveys of municipal representatives who provide information on the percentage of inhabitants with the service and other information. The data is reported nationally and by sub-region and disaggregated by size of municipality. As the survey is done for the entire Latin America and the Caribbean Region, it allows comparisons of data from Argentina with averages for the Region.

Table 9. Street Sweeping and Cleaning Services, 2001 and 2010

Service	Indicator	Region in Argentina (2010)			Size of Municipality (2010)				National Average (2010)	Latin America and the Caribbean	
		Region I	Region II	Region III	Micro	Small	Medium	Large		Average 2010	Average 2001
Street Sweeping	Service with manual sweeping (% of population)	76.9	49.8	62.2	67.6	67	62.9	60.2	62.7	75.2	74.3
	Service with mechanized sweeping (% of population)	6.9	14.5	22.7	12.9	9.3	22.6	18.1	18.9	7.1	17.4
	Total service coverage (% of population)	83.9	64.3	84.9	80.6	76.3	85.4	78.3	81.6	82.3	91.7
	Number of sweeping vehicles per 10,000 inhabitants with service	0.9	0.1	0.4	1.0	0.6	0.6	0.1	0.4	0.2	0.1
	Vehicles in good working order (% of street sweeping vehicles)	100	100	84	100	100	87	85	87	81	—
Special Services	Municipalities with maintenance of parks and gardens service (% of municipalities)	78.6	100	91.5	—	—	—	—	89.5	—	—
	Municipalities with cleaning of fairs and exhibitions service (% of municipalities)	79.6	45.1	58.4	—	—	—	—	61.8	—	—

Source: Own elaboration based on EVAL, 2002; EVAL, 2010; and IDB Technical Note, 2013.
Region I: Provinces of Catamarca, Chaco, Formosa, Jujuy, La Rioja, Salta, Santiago del Estero, and Tucumán.
Region II: Provinces of Corrientes, Entre Ríos, Mendoza, Misiones, San Juan, and San Luis.
Region III: Provinces of Buenos Aires, Córdoba, Chubut, La Pampa, Neuquén, Río Negro, Santa Cruz, Santa Fe, Tierra del Fuego, and the City of Buenos Aires.
Municipality size: Large: 300,001 to 5,000,000 inhabitants; medium: 50,001 to 300,000 inhabitants; small: 15,001 to 50,000 inhabitants; and micro: municipalities with less than 15,000 inhabitants.

3. ***Waste transfer services***

3. Waste transfer services

There are waste transfer stations in the City of Buenos of Aires and 8 out of the 23 provinces. An estimated 20.5 percent of the solid waste generated in the country goes through waste transfer stations.

There are waste transfer stations in 6 of the 31 main urban agglomerations. 31.4 percent of the solid waste generated in the 31 main urban agglomerations goes through transfer stations.

Waste transfer stations located in Greater Buenos Aires are responsible for 76.3 percent of the total solid waste transferred in the country. This amounts to 7,300 tons of waste per day.

The use of waste transfer stations is more significant in large municipalities. The percentage of the population that have waste transfer service is 42 percent among large municipalities (300,001- 5 million inhabitants) and zero percent in municipalities with less than 15,000 inhabitants.

There are three common circumstances where waste transfer stations are found in Argentina. Waste transfer stations are found in several very large urban agglomerations; in municipalities with significant tourism; and in cases where regional disposal systems were encouraged by a particular policy or financing source.

3.1 Regional Evaluation of Municipal Solid Waste Management in Latin America and the Caribbean (EVAL)

The Regional Evaluation of Municipal Solid Waste Management (EVAL), 2010 provides information on solid waste transfer services from a sample of municipalities. Results are based on surveys of municipal representatives who provide information on the percentage of inhabitants with waste transfer service for collected waste. The data is reported nationally and disaggregated by size of municipality. As the survey is done regionally it allows comparisons with the entire Latin America and the Caribbean Region.

Table 10. Percentage of Inhabitants with Waste Transfer Service for Collected Waste, 2010, by Municipality Size

Micro	Small	Medium	Large	Overall	Latin America and the Caribbean Average
0%	7.6%	2.8%	42.0%	16.9%	28.2%

Source: Own elaboration based on EVAL, 2010.
Municipality size: Large: 300,001 to 5,000,000 inhabitants; medium: 50,001 to 300,000 inhabitants; small: 15,001 to 50,000 inhabitants; and micro: municipalities with less than 15,000 inhabitants.

Data analysis

- EVAL indicates the use of waste transfer stations is not common in the country (16.9 percent of the population have this service), with levels lower than the average for the Latin America and the Caribbean Region (28.2 percent).

- EVAL indicates there are differences in waste transfer service coverage depending on the size of the municipality. Municipalities with less than 300,000 inhabitants have significantly lower levels of waste transfer service coverage, indicating that waste transfer stations are mainly used in larger municipalities.

- No municipality with less than 15,000 inhabitants has waste transfer service.

3.2 National Urban Solid Waste Management Project (MAyDS) and publically available information.

For the purposes of this report, a compilation of existing waste transfer stations and an estimation of the tons of solid waste that go through waste transfer stations was carried out. The data was based on available information from the National Urban Solid Waste Management Project (MAyDS), consultations with municipal representatives, and information available in official Internet webpages. The data is different than that of EVAL is based on the tons of waste being transferred rather than the population covered by transfer service.

Table 11. Existing Transfer Stations in Argentina, 2015, by Province and the City of Buenos Aires.

Province	Location of Waste Transfer Station	Municipalities using waste transfer station	Transferred Tons per Day
City of Buenos Aires	Colegiales Pompeya Flores Zavaleta (only receives debris and pruning waste)	City of Buenos Aires and some departments ('partidos') in Greater Buenos Aires, operated by CEAMSE[2]	1,750 2,100 2,000 500
Buenos Aires	Almirante Brown	Some departments in Greater Buenos Aires, operated by CEAMSE	950
Misiones	The province has 25 waste transfer stations.	Whole province	475
Chubut	Puerto Madryn Trelew Los Cipreses Lago Rosario	Puerto Madryn Trelew and Rawson Trevellin	50 65 5
Santa Fe	Bella Vista	Rosario	680
Tucumán	San Felipe	Greater San Miguel de Tucumán	900
La Rioja	Guadacol-Pagancillo	Guadacol and Pagancillo	2.5
Córdoba	Villa Carlos Paz Unquillo La Falda	Villa Carlos Paz Unquillo La Falda	50 10 10
Neuquén	San Martín de los Andes	San Martín de los Andes	20
Total solid waste transferred (tons)			**9,568**
Solid waste transferred as a proportion of total solid waste generation in the country[1] **The proportion of the total solid waste transferred that goes through in CEAMSE transfer stations**			**20.5%** **76.3%**

Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2015.
[1] The total generation of solid waste countrywide is 46,706 tons/day. Based on average of 1.09 kg of waste per person per day (the average generation of waste for the population from which waste was collected and disposed in sanitary landfills as derived from this report) and a total population of 42,669,500 inhabitants (National Census 2010, 2014 projection).
[2] CEAMSE ('Coordinación ecológica area metropolitana Sociedad del Estado') is a public service company that provides waste services for much of Greater Buenos Aires.

Table 12. Waste transfer Stations in Argentina, 2015, by Urban Agglomeration

Urban agglomeration	Waste Transfer Station	Municipalities	Transferred Waste (Tons per Day)
Greater Buenos Aires			
Buenos Aires Province and the City of Buenos Aires	Colegiales Pompeya Flores Zavaleta (only receives debris and pruning waste) Almirante Brown	The City of Buenos Aires and some departments ('partidos') from Greater Buenos Aires that are covered by CEAMSE.	1,750 2,100 2,000 500 950
Northeast			
Posadas	Posadas	Posadas and others (the whole province is regionalized and counts with 25 waste transfer stations).	160
Northwest			
Greater San Miguel de Tucumán	San Felipe	Greater San Miguel de Tucumán	900
Pampeana			
Greater Rosario **Greater Cordoba**	Bella Vista Unquillo	Rosario and other municipalities from Greater Rosario Unquillo	680 10
Patagonia			
Rawson-Trelew	Trelew Rawson	Trelew and Rawson Rawson (transports waste to Trelew´s waste transfer station)	65
Solid waste transferred **Solid waste transferred in Greater Buenos Aires**			**9,115** **7,300**
Solid waste transferred as a proportion of total solid waste generated in 31 main urban agglomerations[1]			**31.4%**
Proportion of solid waste transferred in the 31 main urban agglomerations that goes through in CEAMSE waste transfer stations			**80.1%**

Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) and publically available information, 2015.
[1] The waste generation the 31 main urban agglomerations is 28,997 tons/day. Based on average of 1.085 kg of waste per person per day (the average generation of waste for the population from which waste was collected and disposed in sanitary landfills in the 31 main urban agglomerations derived from this report) and a total population of 26,725,120 inhabitants (National Census 2010, 2014 projection).

Data analysis

- Waste transfer service exists in the City of Buenos Aires and in 8 out of 23 provinces (37.5 percent of these jurisdictions). The province with the highest number of waste transfer stations is Misiones (25 transfer stations).

- Waste transfer stations exist in 6 out of the 31 main urban agglomerations: Greater Buenos Aires; Greater San Miguel; Greater Rosario; Greater Cordoba; Posadas; and Rawson-Trelew.

- The waste transfer stations located in Greater Buenos Aires account for the majority total solid waste transferred in the country and in the 31 main agglomerations.

- Table 11 indicates there are three main areas where waste transfer stations are located: (i) the large urban agglomerations (Greater Buenos Aires, Greater San Miguel de Tucumán, and Rosario);(ii) small and medium-sized tourist municipalities (Pagancillo, Trevelin, San Martín de los Andes, and Puerto Madryn); and (iii) those where provincial authorities encouraged the establishment of regional disposal systems that involve waste transfer stations (Misiones and Cordoba) or where international financing institutions had programs to encourage this (the waste transfer stations in Tucumán, La Rioja, Chubut, and Neuquén were developed as part of regional disposal systems that were encouraged by IADB and World Bank – financed programs).

4. ***Waste treatment services***

4. Waste treatment services

There are 147 solid waste treatment plants in the country. The City of Buenos Aires and 19 out of the 23 provinces have at least one waste treatment plant. The provinces of Entre Ríos, Buenos Aires, and Santa Fe have the most, with more than 20 plants each.

The waste treatment plants in the country have a combined designed treatment capacity of 8,675 tons per day, enough to treat 18.6 percent of total solid waste generated in the country. Most treatment plants, however, operate below their designed treatment capacity and, in some cases, the plants are not operating.

Most of the plants have a small to medium waste treatment capacity. 137 of the 147 waste treatment plants in the country have a capacity of less than 100 of tons of waste per day.

Larger treatment plants are found in the main urban agglomerations. 1/3 of Argentina's waste treatment plants (49 plants), accounting for 78 percent of the waste treatment capacity (6,735 tons/day) in the country, is installed in the 31 main urban agglomerations.

The City of Buenos Aires has the largest plants. Considering all the City's waste treatment plants together, they account for 44.5 percent of total waste treatment capacity in the country and 57.3 percent of the capacity in the 31 main urban agglomerations.

4.1 Data from the National Urban Solid Waste Management Project (MAyDS) and publically available information.

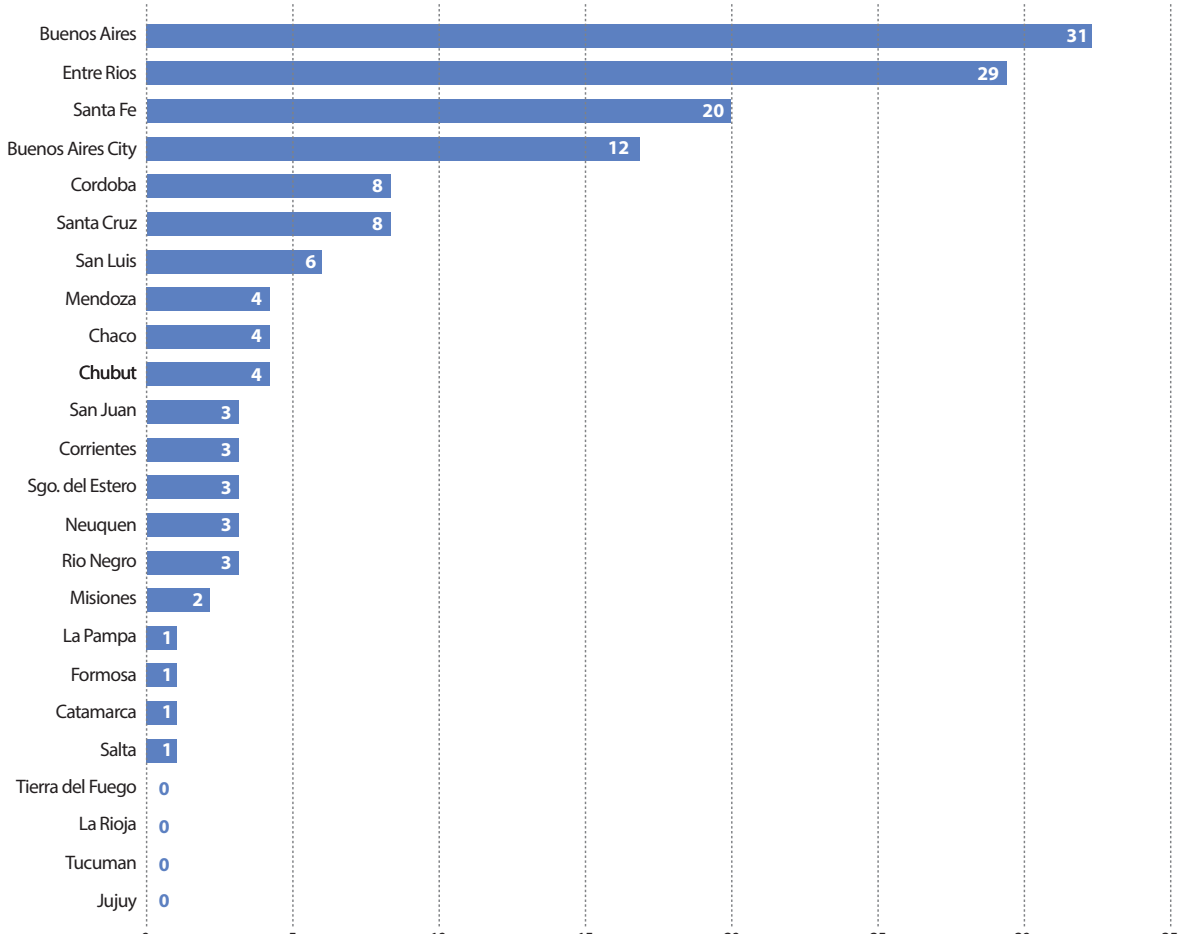
The information presented in this chapter is based on public information provided by municipal representatives and treatment plant suppliers compiled in 2015 as well as diagnostics carried out by the National Urban Solid Waste Management Project (MAyDS) in Formosa, Catamarca, Río Negro, and Entre Ríos provinces in 2014. Information on existing solid waste treatment plants, the municipality or municipalities using the plant, the population, and the estimated treatment capacity of the plant was compiled along with data on solid waste recycling companies. The data includes constructed mechanized separation plants and uses the design treatment capacity but does not provide information on the capacity in operation and therefore the actual amount being treated. It also does not include other forms of recycling such as 'green points', and formal and informal manual segregation activities undertaken outside of a treatment plant.

Table 13. Solid Waste Treatment Capacity of Plants in Operation in Argentina, 2014-2015

	Number of waste treatment plants	Waste Treatment Capacity		
		Installed Capacity (Tons of waste/day)	% of waste generated in Argentina[1]	% of waste treatment capacity in Argentina
City of Buenos Aires waste treatment plants[2]	12	3,860	8.3%	44.5%
Other waste treatment plants in Argentina	135	4,815	10.3%	55.5%
All waste treatment plants in Argentina[2]	**147**	**8,675**	**18.6%**	**100%**

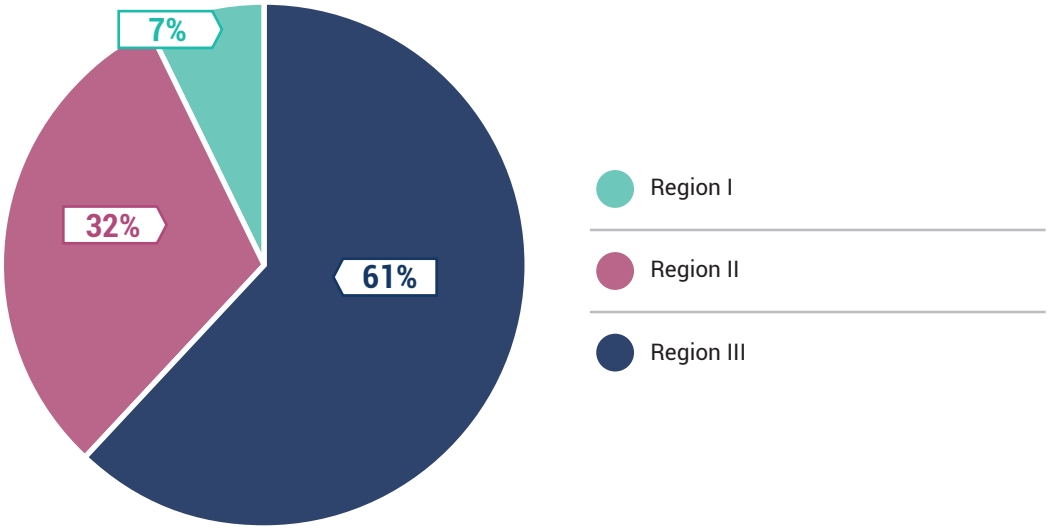
Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2014-2015.
[1] The total solid waste generation in the country is 46,706 tons/day. Based on average of 1.09 kg of waste per person per day (the average generation of waste for the population from which waste was collected and disposed in sanitary landfills derived from this report) and a total population of 42,669,500 inhabitants (National Census 2010, 2014 projection).
[2] Plants under procurement or construction are not included.

Figure 6.
Number of Solid Waste Treatment Plants, 2014-2015, by Province and the City of Buenos Aires



Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2014-2015.

Figure 7.
Percentage of Waste Treatment Plants, 2014-2015, by Region



Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2014-2015.
Region I: The provinces of Catamarca, Chaco, Formosa, Jujuy, La Rioja, Salta, Santiago del Estero and Tucumán.
Region II: The provinces of Corrientes, Entre Ríos, Mendoza, Misiones, San Juan and San Luis.
Region III: The provinces of Buenos Aires, Córdoba, Chubut, La Pampa, Neuquén, Río Negro, Santa Cruz, Santa Fe, Tierra del Fuego and the City of Buenos Aires.

Table 14. Treatment Facilities and Capacity, 2015, by Province and the City of Buenos Aires

Province	Municipality	Inhabitants	Treatment	Capacity (tons per day)
City of Buenos Aires		2,965,000	Construction and demolition waste plant (2,400 tons per day capacity, 90 percent recovery rate, and 70 jobs generated).	2,400
			Mechanical-biological treatment plant Norte III (1,000 tons per day capacity, 50 percent recovery rate, and 120 jobs generated).	1,000
			Mechanical-biological treatment for the north of the city (1,000 tons per day capacity, and 60 percent recovery rate).	1,000 (under procurement)
			Mechanical-biological treatment for the south of the city (1,000 tons per day capacity, 60 percent recovery rate).	1,000 (under procurement)
			8 recycling centers (4,200 informal waste workers were formalized and now work in the streets and the centers).	350 (in 8 plants)
			Compost plant for food waste from restaurants and supermarkets combined with green waste (10 tons per day)	10
			Plastic recycling plant (20 tons/day).	20 (under construction)
			Plant for treatment of wood and other green waste (100 tons per day, 17 jobs).	100

Province	Municipality	Inhabitants	Treatment	Capacity (tons per day)
Buenos Aires	Malvinas Argentinas	321,833	Separation plant.	25
	Morón	321,109	Separation plant.	25
	Berazategui	167,498	Separation plant.	50
	Moreno	434,572	Separation plant.	50
	Almirante Brown	552,902	Separation plant.	25
	Avellaneda	342,677	Separation plant.	25
	Ezeiza	163,722	Separation plant and composting plant.	80
	Campana (Tenaris)	86,860	Separation plant and composting plant.	25
	San Andrés de Giles	16,243	Separation plant.	15
	Azul	55,728	Separation plant.	50
	Rojas	19,766	Separation plant.	15
	Bahia-Blanca	301,531	Composting plant.	140
	Bahia-Blanca/Cerri	301,531	Separation plant.	60
	Mar del Plata	593,337	Separation plant.	120
	San Nicolás	133,602	Separation plant.	50
	Rauch	13,316	Separation plant and composting plant.	15
	Bragado	33,222	Separation plant.	11
	Laprida	8,840	Separation plant.	10
	25 de Mayo	23,408	Separation plant.	20
	Roque Perez	10,358	Separation plant.	10
	Lincoln	40,355	Separation plant.	40
	Coronel Pringles	20,263	Separation plant.	20
	Greater Buenos Aires	10,796,415	CEAMSE-Social plants for informal recyclers (9 plants).	650 (in 9 plants)
Santa Fe	Rosario	948,312	Bella Vista - Separation plant and composting plant.	220
		948,312	Bella Vista - Construction and demolition waste plant.	350
	Rafaela	92,945	Separation, composting, and construction and demolition waste plants.	100
	Santa Fe	526,366	Separation plant and composting plant.	50
	San Jorge	18,056	Separation plant and composting plant.	18
	San Justo	21,078	Separation plant.	20
	Esperanza	42,082	Separation plant.	20
	Franck	5,505	Separation plant.	5
	Fighiera	5,028	Separation plant.	5
	San Genaro	8,731	Separation plant.	8
	Sastre	5,717	Separation plant.	5
	Pilar	4,959	Separation plant.	5
	San Carlos Centro	13,157	Separation plant.	10
	Casilda	35,058	Separation plant.	20
	Recreo	14,205	Separation plant.	15
	Greateradero Baigorria	37,333	Separation plant.	25
	Venado Tuerto	83,263	Separation plant.	50
	El Trébol	11,523	Separation plant.	10
	Ceres	14,499	Separation plant.	15
	Avellaneda	25,995	Separation plant.	25
Córdoba	Río Primero	46,675	Separation plant.	40
	Villa María	98,169	Separation plant.	20
	Cruz del Eje	30,680	Separation plant.	25

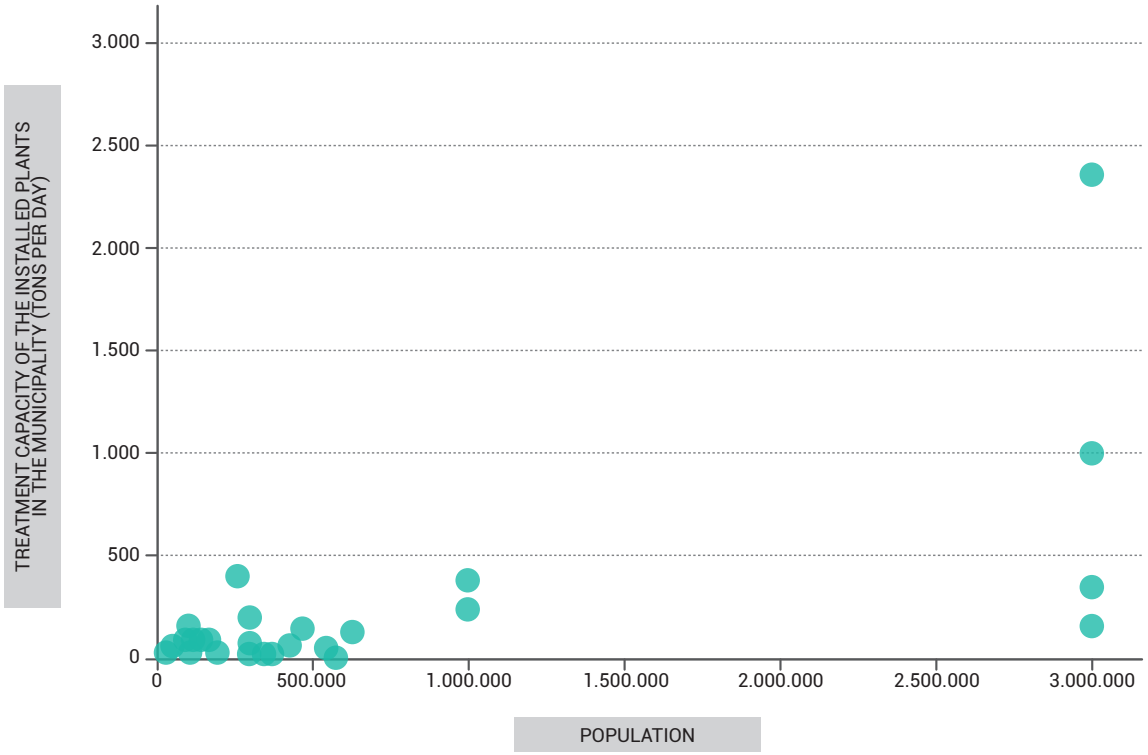
Province	Municipality	Inhabitants	Treatment	Capacity (tons per day)
Córdoba	Jesús María	31,602	Separation plant.	25
	Santa Rosa de Calamuchita	12,395	Separation plant.	10
	Villa Dolores (burned)	31,853	Separation plant.	25
	Obispo Trejo	1,919	Separation plant.	10
	Las Higueras	6,038	Separation plant.	5
La Pampa	Santa Rosa	124,545	Separation plant.	50
Mendoza	Maipú	172,861	Separation plant and composting plant.	80
	San Carlos	32,683	Separation plant.	15
	Malargue	2,887	Separation and composting plant.	10
	General Alvear	49,499	Separation and composting plant.	20
San Luis	Carpintería (regional plant)	50,000	Separation and composting plant.	50
	Tilisarao (regional plant for Chacabuco department)	20,744	Separation plant.	20
	La Toma (regional plant for Coronel Pringles department)	13,157	Separation plant.	12
	San Luis capital city	209,414	Separation plant.	25
	Junín department	28,933	Separation plant.	20
	Ayacucho department	18,927	Separation plant.	15
San Juan	San Juan capital	471,389	Separation and composting plant.	100
	Iglesias	9,099	Separation plant.	10
	Jachal	14,749	Separation plant.	12
Entre Ríos	Gualeguaychú	97,839	Separation plant.	50
	Paraná	247,000	Separation plant.	400
	Concordia	152,282	Separation plant.	50
	Gualeguay	43,009	Separation and composting plant.	50
	Urdinarrain	8,956	Separation plant.	10
	Colón	24,835	Separation plant.	25
	Federal	18,015	Separation plant.	20
	Seguí	4,800	Separation plant.	5
	Diamante	19,930	Separation plant.	20
	Concepción del Uruguay	73,729	Separation plant.	50
	Villaguay	34,637	Separation plant.	20
	General Galarza	4,896	Separation plant.	5
	Bovril	8,790	Separation plant.	10
	Chajarí	34,848	Separation plant.	35
	Victoria	31,848	Separation plant.	30
	La paz	25,808	Separation plant.	25
	Crespo	20,203	Separation plant.	20
	San josé	18,178	Separation plant.	20
	Federación	17,547	Separation plant.	20
	Rosario del tala	13,723	Separation plant.	15
	San Salvador	13,228	Separation plant.	15
	San José Feliciano	12,084	Separation plant.	10
	Villa Elisa	11,117	Separation plant.	10
	Basavilbaso	9,742	Separation plant.	10

Province	Municipality	Inhabitants	Treatment	Capacity (tons per day)
Entre Ríos	Viale	9,641	Separation plant.	10
	Oro Verde	4,333	Separation plant.	5
	Villa Paranacito	4,215	Separation plant.	5
	Ceibas	1,405	Separation plant.	2
	Villa del Rosario	3,973	Separation plant.	5
Corrientes	Curuzú Cuatiá	34,470	Separation plant.	20
	Bella Vista	29,071	Separation plant.	25
	Paso de la Patria	5,598	Separation plant.	5
Misiones	Puerto Iguazú	42,849	Separation plant.	42
	Montecarlo	24,338	Separation plant.	25
Santiago del Estero	Termas de Río Hondo	32,166	Separation plant.	13
	Ojo de agua	14,008	Separation plant.	15
	La Banda (burned)	360,923	Separation plant.	25
Chaco	Makalle	3,812	Separation plant.	5
	Fontana - Fiduciaria del Norte	32,027	Separation plant.	25
	Isla de Cerrito	1,624	Separation plant.	2
	Presidencia Roque Saenz Peña	96,944	Separation plant.	25
Formosa	Laguna Blanca	7,411	Separation plant.	10
Catamarca	San Fernando del Valle de Catamarca	195,055	Separation plant.	15
Salta	Salta (Fundación capacitar del NOA)	554,125	Separation plant.	25
Neuquén	Villa la Angostura	11,063	Separation plant.	10
	San Martín de los Andes	27,956	Separation plant.	10
	Junin de los Andes	14,220	Separation plant.	10
Río Negro	Bariloche	112,887	Separation plant.	50
	El Bolsón	19,009	Separation plant.	10
	Choele Choel	10,146	Separation and composting plant.	10
Chubut	Puerto Madryn	93,995	Separation plant.	80
	Trelew	99,430	Separation plant.	80
	Comodoro Rivadavia	124,104	Separation plant.	50
	Esquel	32,343	Separation and composting plant.	20
Santa Cruz	Luis Piedrabuena	6,405	Separation and composting plant.	5
	Puerto San Julián	7,894	Separation and composting plant.	10
	Caleta Olivia (YPF)	67,493	Separation and composting plant.	50
	Las Heras	17,821	Separation and composting plant.	15
	Pico Truncado	20,889	Separation and composting plant.	20
	Río Turbio	8,847	Separation plant.	10
	Puerto Deseado	14,587	Separation and composting plant.	15
	Calafate	21,132	Separation and composting plant.	25

Total Treatment capacity for constructed plants (tons per day)	**8,675**
Total Installed waste treatment capacity over total waste generation[1]	**18.6%**
Total treatment capacity for plants under construction (tons per day)	20
Total treatment capacity for plants under procurement (tons per day)	2,000
Total treatment capacity including those under construction and procurement (tons per day)	10,695

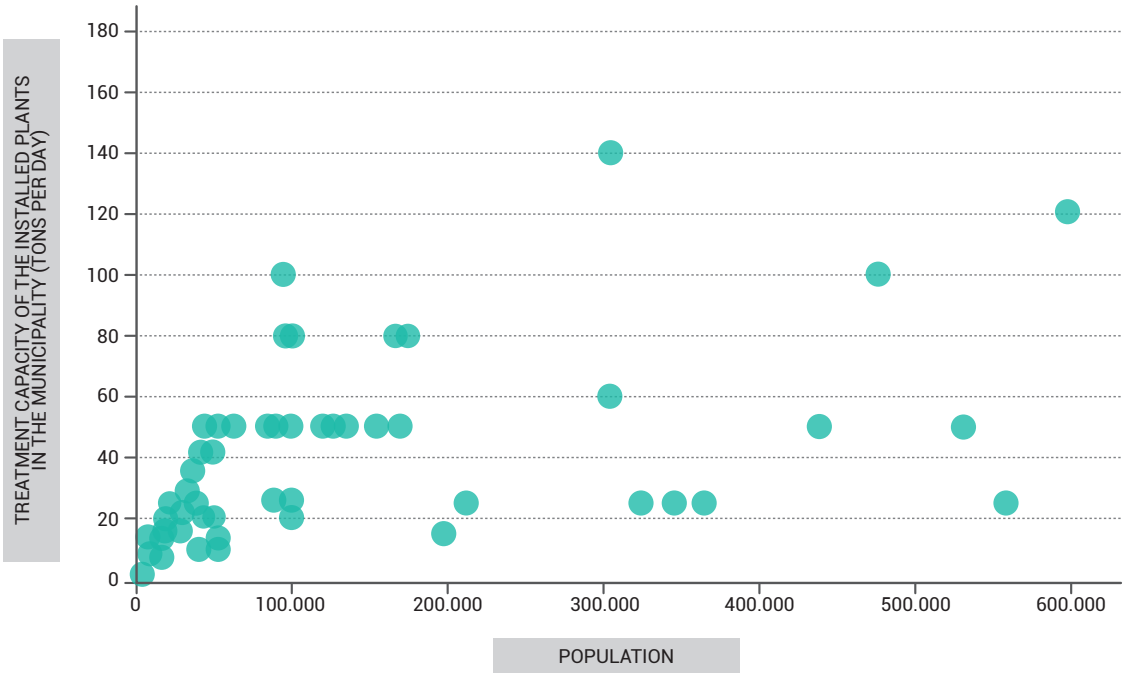
Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2014-2015.
[1] The total generation of solid waste countrywise is 46,706 tons/day. Based on average of 1.09 kg of waste per person per day (the average generation of waste for those from which waste was collected and disposed in sanitary landfills derived from this report) and a total population of 42,669,500 inhabitants (National Census 2010, 2014 projection).

Figure 8.
Waste Treatment Capacity versus Municipality Size for Solid Waste Treatment Plants, 2014-2015



Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2014-2015.

Figure 9.
Waste Treatment Capacity versus Municipality Size for Solid Waste Treatment Plants with a Capacity of Less than 200 tons per day, 2014-2015



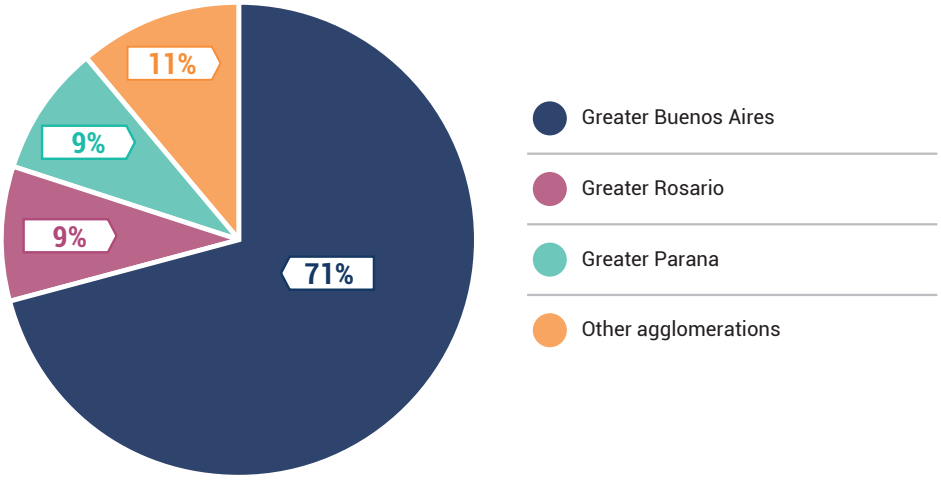
Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2014-2015.

Table 15. Waste Recycling Companies, 2014, by Province and the City of Buenos Aires

Indicator	Buenos Aires	City of Buenos Aires	Santa Fe	Entre Ríos	Other provinces	Total
Number of companies	110	30	50	6	47	243
% of total number of companies	45.3	12.3	20.6	2.5	19.3	100.0

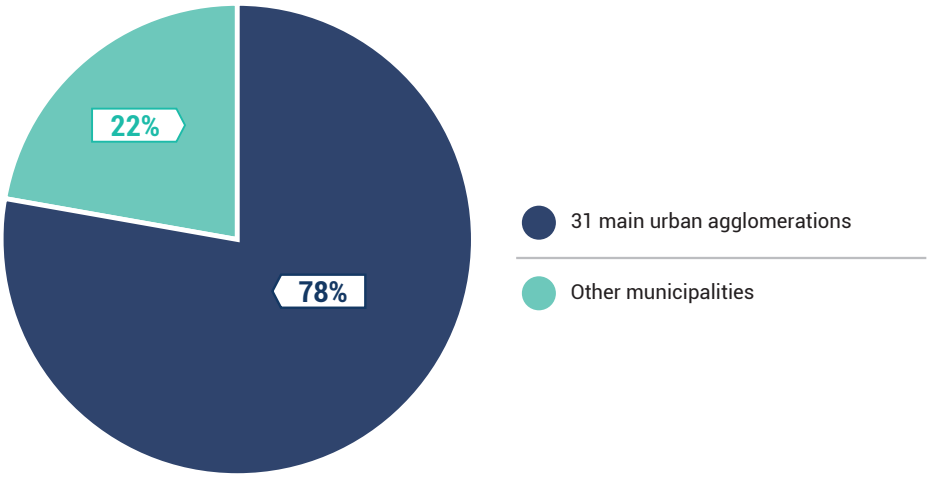
Source: Own elaboration based on information from Entre Ríos Provincial Solid Waste Management Plan, 2014.

Figure 10.
Distribution of Waste Treatment Capacity in the 31 Main Urban Agglomerations, 2014-2015



Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2014-2015.

Figure 11.
Installed Waste Treatment Capacity, 2014-2015



Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2014-2015.

Table 16. Capacity of Waste Treatment Facilities, 2014-2015, by Urban Agglomeration

Urban Agglomeration	Province	Locality	Inhabitants	Treatment	Capacity (tons per day)
Greater Buenos Aires	City of Buenos Aires		2,965,000	Construction and demolition waste treatment plant (2,400 tons per day capacity, 90% recovery rate, and 70 jobs generated).	2,400
				Mechanical-biological treatment plant Norte III (1,000 tons per day capacity, 50% recovery rate, and 120 jobs generated).	1,000
				8 recycling centers (600 tons per day capacity, 4,200 informal waste workers were formalized and now work in the streets and the centers).	350
				Compost plant for food waste from restaurants and supermarkets combined with green waste (10 tons per day)	10
				Plant for treatment of wood and other green waste (100 tons per day, 17 jobs).	100
	Buenos Aires	Malvinas Argentinas	321,833	Separation plant.	25
		Morón	321,109	Separation plant.	25
		Berazategui	167,498	Separation plant.	50
		Moreno	434,572	Separation plant.	50
		Almirante Brown	552,902	Separation plant.	25
		Avellaneda	342,677	Separation plant.	25
		Ezeiza	163,722	Separation plant and composting plant.	80
		Greater Buenos Aires	10,796,415	CEAMSE-Social plants (manual operation by informal recyclers, 9 plants, and 8% recovery rate).	650
Bahia Blanca/Cerrito		Bahia-Blanca	301,531	Composting plant.	140
		Bahia-Blanca/ Cerrito	301,531	Separation plant 'Daniel Cerri'.	60
Mar del Plata-Batan		Mar del Plata	593,337	Separation plant.	120
San Nicolas-Villa Constitucion		San Nicolás	133,602	Separation plant.	50
Greater Rosario	Santa Fe	Rosario	948,312 948,312	Bella Vista - separation and composting plant. Bella Vista - construction and demolition waste plant.	220 350
		Granadero Baigorria	37,333	Separation plant.	25
Greater Santa Fe		Santa Fe	526,366	Separation plant and composting plant.	50
Santa Rosa- Toay	La Pampa	Santa Rosa	124,545	Separation plant.	50
Greater Mendoza	Mendoza	Maipú (Greater Mendoza)	172,861	Separation plant and composting plant.	80
San Luis	San Luis	San Luis city	209,414	Separation plant.	25
Greater San Juan	San Juan	Greater San Juan	471,389	Separation plant and composting plant.	100

Urban Agglomeration	Province	Locality	Inhabitants	Treatment	**Capacity** (tons per day)
Concordia	Entre Ríos	Concordia	152,282	Separation plant.	50
		Oro Verde	4,333	Separation plant.	5
Greater Parana		Paraná	247,000	Separation plant.	400
Santiago del Estero/ La Banda	Santiago del Estero	La Banda	360,923	Separation plant.	25
Greater Resistencia	Chaco	Fontana / Fiduciaria del Norte	32,027	Separation plant.	25
Greater Catamarca	Catamarca	San Fernando del Valle de Catamarca	195,055	Separation plant.	15
Greater Salta	Salta	Salta	554,125	Separation plant.	25
Neuquén-Plottieer	Neuquén	Neuquén/Plottier	304,572	Separation and composting plant.	50
Rawson-Trelew	Chubut	Trelew	99,430	Separation plant.	80
Total installed waste treatment capacity for constructed plants in the 31 main urban agglomerations (tons per day)[1]					**6,735**
Total Installed waste treatment capacity over total waste generation[2] in the 31 main urban agglomerations					**23.2%**

Own elaboration based on National Urban Solid Waste Management Project (MAyDS) data and publically available information, 2014-2015.
[1] The City of Buenos Aires north and south mechanical biological treatment plants that are under procurement and the plastic recycling plant under construction are not included in this estimate.
[2] The total generation countrywide is 28,997 tons/day. Based on average of 1.085 kg of waste per person per day (the average generation of waste for those from which waste was collected and disposed in sanitary landfills derived from this report) and a total population of 26,725,120 inhabitants (National Census 2010, 2014 projection).

Data analysis

- There are 147 solid waste treatment plants constructed in the country with a combined installed treatment capacity of 8,675 tons per day.

- The City of Buenos Aires and 19 out of the 23 provinces have at least one plant. The provinces of Entre Ríos, Buenos Aires, Santa Fe have the most, with more than 20 plants each.

- 18 of the 31 main urban agglomerations have waste treatment plants.

- The largest quantity of waste treatment plants are located in Region III (61 percent of the plants in the country), followed by Region II (32 percent). Region I has the smallest number (7 percent).

- 78 percent of the waste treatment capacity (6,735 tons per day) but only 1/3 of the waste treatment plants (49 plants) in the country are located in the 31 main urban agglomerations of the country.

- The City of Buenos Aires has a waste treatment capacity of 3,860 tons per day which accounts for 44.5 percent of total waste treatment capacity in the country and 57.3 percent of the waste treatment capacity in the 31 main urban agglomerations. There are also 3 plants under procurement or construction in the City of Buenos Aires that together would provide an additional 2,020 tons per day of installed waste treatment capacity.

- An estimated 18.6 percent of the total solid waste generated in the country and 23.2 percent of the solid waste generated in the 31 main urban agglomerations could be treated if the capacity of constructed waste treatment plants is fully utilized.

- With a combined capacity of 2,750 tons per day, the construction and demolition waste treatment plants in the City of Buenos Aires and Rosario account for 31.7 percent of the country's installed waste treatment capacity and 40.8 percent of the installed treatment capacity in the 31 main urban agglomerations.

- Most installed waste treatment plants are small or medium sized (only 10 out of 147 waste treatment plants have a capacity greater than or equal to 100 tons per day). Apart from the waste treatment plants in the City of Buenos Aires, the largest facilities are found in Rosario (2 plants, 350 and 220 tons per day), Paraná (400 tons per day), Bahia-Blanca (140 tons per day), and Mar del Plata (120 tons per day).

- Table 14 shows that the waste recycling companies are concentrated in the provinces of Buenos Aires and Santa Fe, and the City of Buenos Aires.

5. ***Waste disposal services***

5. Waste disposal services

An estimated 53.5 percentof the population dispose of their waste in sanitary landfills. An estimated 19.8 million people do not have this service and 24,101 tons of waste per day is not properly disposed.

The City of Buenos Aires and 17 out of 23 provinces have at least one sanitary landfill in operation. Notable exceptions are the provinces of Santa Cruz, Corrientes, Catamarca, Jujuy, Chaco, and Formosa.

89 percent of the landfill capacity in the country is located in the 31 main urban agglomerations where 77 percent of the population have sanitary landfill disposal service. However, 13 out of the 31 main urban agglomerations do not have a sanitary landfill including five in the northern part of the country (Jujuy-Palpala, Greater Resistencia, Santiago del Estero-La Banda, Greater Catamarca, and Corrientes).

Regional disposal service provision is common but takes different forms. In several urban agglomerations there are disposal services shared among different municipalities. A variety of institutional arrangements have been pursued including the formation of public companies, consortiums of municipalities and having a single municipality provide the service for others.

5.1 Regional Evaluation of Municipal Solid Waste Management in Latin America and the Caribbean (EVAL)

The Regional Evaluation of Municipal Solid Waste Management (EVAL), 2002 and 2010 provides data on solid waste disposal practices (sanitary landfill, dumpsites and burning practices) and equipment for disposal from a sample of municipalities. Results are based on surveys of municipal representatives who provide information on the percentage of inhabitants with waste disposal service for collected waste. The data is reported nationally, by region and disaggregated by size of municipality. As the survey is done regionally it allowed comparisons with the entire Latin America and the Caribbean Region.

Table 17. Waste Disposal Service Coverage, 2001 and 2010

Indicator	By Region			By population of municipality (2010)				National 2010	National 2001	Latin America and the Caribbean Average (2010)
	I	II	III	< 15,000	15,000-50,000	50,000-300,000	> 300,000			
Population disposing waste in a sanitary landfill (%)	50.1	15.2	79.4	9.4	24.5	62.7	89.4	64.7	60.7	54.4
Population disposing waste in a controlled dumpsite (%)	21.4	38.9	0.6	—	—	—	—	9.9	5.6	18.5
Population disposing waste in an open dumpsite (%)	25.5	44.9	19.7	75.4	57.8	25	5.2	24.6	—	23.3

Indicator	By Region			By population of municipality (2010)				National 2010	National 2001	Latin America and the Caribbean Average (2010)
	I	II	III	< 15,000	15,000-50,000	50,000-300,000	> 300,000			
Population burning waste (%)	3	1	0.3	—	—	—	—	0.80	—	2.0
Pieces of equipment for compacting per 10,000 inhabitants with service	0.37	0.14	0.24	—	—	—	—	0.25	0.05	—
Pieces of equipment for placing daily waste cover material per 10,000 inhabitants with service	0.51	0.19	0.45	—	—	—	—	0.42	0.06	—
Pieces of equipment for other disposal activities per 10,000 inhabitants with service	0.23	0.25	0.46	—	—	—	—	0.40	0.09	—

Source: Own elaboration based on: EVAL, 2010; EVAL, 2001; and IADB Technical Note, 2013.
Region I: Provinces of Catamarca, Chaco, Formosa, Jujuy, La Rioja, Salta, Santiago del Estero, and Tucumán.
Region II: Provinces of Corrientes, Entre Ríos, Mendoza, Misiones, San Juan, and San Luis.
Region III: Provinces of Buenos Aires, Córdoba, Chubut, La Pampa, Neuquén, Río Negro, Santa Cruz, Santa Fe, Tierra del Fuego, and the City of Buenos Aires.

Data analysis

- According to EVAL, in 2010, the country has a higher sanitary landfill waste disposal service coverage (64.7 percent) than the average for the Latin America and the Caribbean Region (54.4 percent).

- According to EVAL, in 2001, 60.7 percent of the population in Argentina disposed of their waste in sanitary landfills, indicating there was not a significant improvement between 2001 and 2010.

- There are significant differences in the proportion of the population that disposes their waste in sanitary landfills between regions. For example, 79.4 of the population of Region III, which includes the Buenos Aires Metropolitan Area, disposes their waste in sanitary landfills where as in Region II 15.2 percent of the population disposes their waste in sanitary landfills.

- In addition, there are differences in waste disposal service coverage depending on population of the municipality. In municipalities with less than 15,000 inhabitants only 9.4 percent of populationon average disposes their waste in sanitary landfills while for municipalities with populations greater than 300,000, 89.4 percent of the population disposes their waste in sanitary landfills.

- For every 10,000 inhabitants with waste disposal service there are: (i) 0.25 pieces of equipment for compacting, (ii) 0.42 pieces of equipment for placing daily waste cover material, and (iii) 0.40 pieces of equipment for other activities related to waste disposal.

- Figures from EVAL, indicate that in 2001 the number of pieces of equipment for operation of a waste disposal site per 10,000 inhabitants are: (i) for compacting of the waste in the disposal site, 0.05, (ii) for placing cover material, 0.06, and (iii) for other activities in the disposal site, 0.09. This indicates that there was a substantial increase the number of pieces of equipment at waste disposal sites between 2002 and 2010.

5.2 **National Urban Solid Waste Management Project (MAyDS), information available from local authorities and operators and publically available information.**

As the data provided by EVAL in 2010 is slightly outdated in terms of sanitary landfill service coverage, for the purposes of this study, a compilation of existing sanitary landfills in the country and an estimation of the total tons of waste disposed in these landfills was carried out.

The data was based on available information from the National Urban Solid Waste Management Project (MAyDS), consultations with municipal representatives or operators, and information available in official Internet web pages and other public documents.

To arrive at an updated value of sanitary landfill waste disposal service coverage and the amount of waste disposed in sanitary landfills, a list of all the existing sanitary landfills in the country was compiled. Quantities of waste (tons per day) disposed in each landfill was gathered. Population served by these landfills was determined by the population of the municipalities served by the landfill that have collection service using National Census data and collection rates from the EVAL 2010 report by region. Total waste generation was determined using the average per capita waste generation for those serviced by these landfills and the total population using National Census data.

Table 18. Sanitary Landfills, 2015, by Province and the City of Buenos Aires

Province	Landfill	Municipalities	Landfilled Tons per Day[1]	Estimated population served
Buenos Aires and the City of Buenos	CEAMSE - Norte III	The City of Buenos Aires, La Plata, and the 34 urban centers ('partidos') from Greater Buenos Aires	13,942	13,169,699
	CEAMSE – Gonzalez Catan			
	CEAMSE - Ensenada		628	787,490
	Bahia Blanca	Bahía Blanca	230	299,107
	Mar del Plata	Gral Pueyrredón	1,100	617,657

Province	Landfill	Municipalities	Landfilled Tons per Day	Estimated population served
Buenos Aires	Olavarría	Olavarría	100	84,517
	Tandil	Tandil	100	94,790
	Laprida	Laprida	2.5	7,704
	San Nicolás	San Nicolás	120	181,995
Santa Fe	Ricardone	10 municipalities from Greater Rosario	1,500	1,262,641
	Rafaela	Rafaela	120	95,922
	Santa Fe	Santa Fe and small municipalities (San José del Rincón, Arroyo Leyes, and Santa Rosa de Calchines)	500	507,071
Cordoba	6 landfills	Including Greater Córdoba (Cordoba city and 17 other municipalities), Villa Dolores and Cruz del eje landfills	2,100	1,641,887
La Pampa	Santa Rosa	Santa Rosa	140	123,190
Entre Ríos	Gualeguaychú	Gualeguaychú	104	89,209
Mendoza	Malargue	Malargue	22	24,562
	Alvear	Alvear	42	25,357
	Zona Este	Rivadavia, San Martín, Santa Rosa, and Junin	180	216,992
San Luis	Donovan	Donovan Capital City Metropolitan Area and small municipalities located in the nearby (Juana Koslay, Potrero, La Punta, San Gerónimo, Balde, El Volcán, Estancia Greaterde, Trapiche, Nogolí, Villa de la Quebrada).	32	32,653
	Villa Mercedes	Villa Mercedes, Justo Darac, Juan Jorba, and Fraga	120	113,149
	Carpintería	Villa de Merlo, Carpintería, Los Molles, Cortaderas, Villa Larca, Villa del Carmen, Papagayos, Concarán, Naschel, San Pablo, Santa Rosa de la Conlara, Renca, and La Punilla	50	47,053
	La Toma	La Toma, Juana Llerena, Paso Grande, el Morro, Saladillo,	9	7,772
San Juan	San Juan	San Juan Capital, Rawson, Rivadavia, Chimbas, Santa Lucia, Pocito, Ullum, Zonda, and Albardón,	550	493,558
	Jachal	San José de Jáchal, Niquivil, San Roque, Villa Mercedes, and Pampa Vieja	12	21,984

Province	Landfill	Municipalities	Landfilled Tons per Day	Estimated population served
Tucumán	San Felipe	The metropolitan public consortium is composed by the following municipalities: San Miguel de Tucumán, Alderetes, Salí River Band, Las Talitas, Tafí Viejo, Yerba Buena; and the communes of San Pablo, El Manantial, Cevil Redondo, Lules, Bella Vista, Raco and San Javier.	900	637,845
Salta	San Javier	Salta Capital City	750	597,680
	Manual sanitary landfills	Tolar Grande, la Puna, Valles Calchaquíes, Iruya, and Coronel Moldes	10	11,111
La Rioja	Villa Unión	Villa Unión	15	4,230
Santiago del Estero	Río Hondo	Río Hondo	33	34,292
Misiones	The whole province is regionalized and counts on 25 waste transfer stations and 2 landfills operated by a private company,	Whole province	800	873,025
Neuquén	Neuquén	Neuquén	300	268,392
	Junin de los andes	Junin de los andes y San Martín de los Andes	58	35,594
Río Negro	El Bolsón	El Bolsón	25	17,165
	General Roca	General Roca	80	77,552
Chubut	Ex Torre Omega	Puerto Madryn, Trelew, Dolavon, Gaiman, and Rawson	120	133,993
	Esquel-Trevellin	Esquel and Trevellin	55	38,627
Tierra del Fuego	Ushuaia	Ushuaia	120	136,168
Total			**24,970**	**22,811,705**
Percentage of total Countrywide[1]			**53.5**	**53.5**

Source: Own elaboration based on information provided through publically available information, by the National Urban Solid Waste Management Project (MAyDS) and by municipal representatives, 2015. Population from which waste is collected and disposed by a particular landfill is based on National Census, 2010 data using the regional waste collection rates of EVAL, 2010.

[1] The total solid waste generation countrywide is 46,706 tons/day. Based on average of 1.09 kg of waste per person per day (the average generation of waste for those from which waste was collected and disposed in sanitary landfills derived from this report) and a total population of 42,669,500 inhabitants (National Census, 2010 projection for 2014).

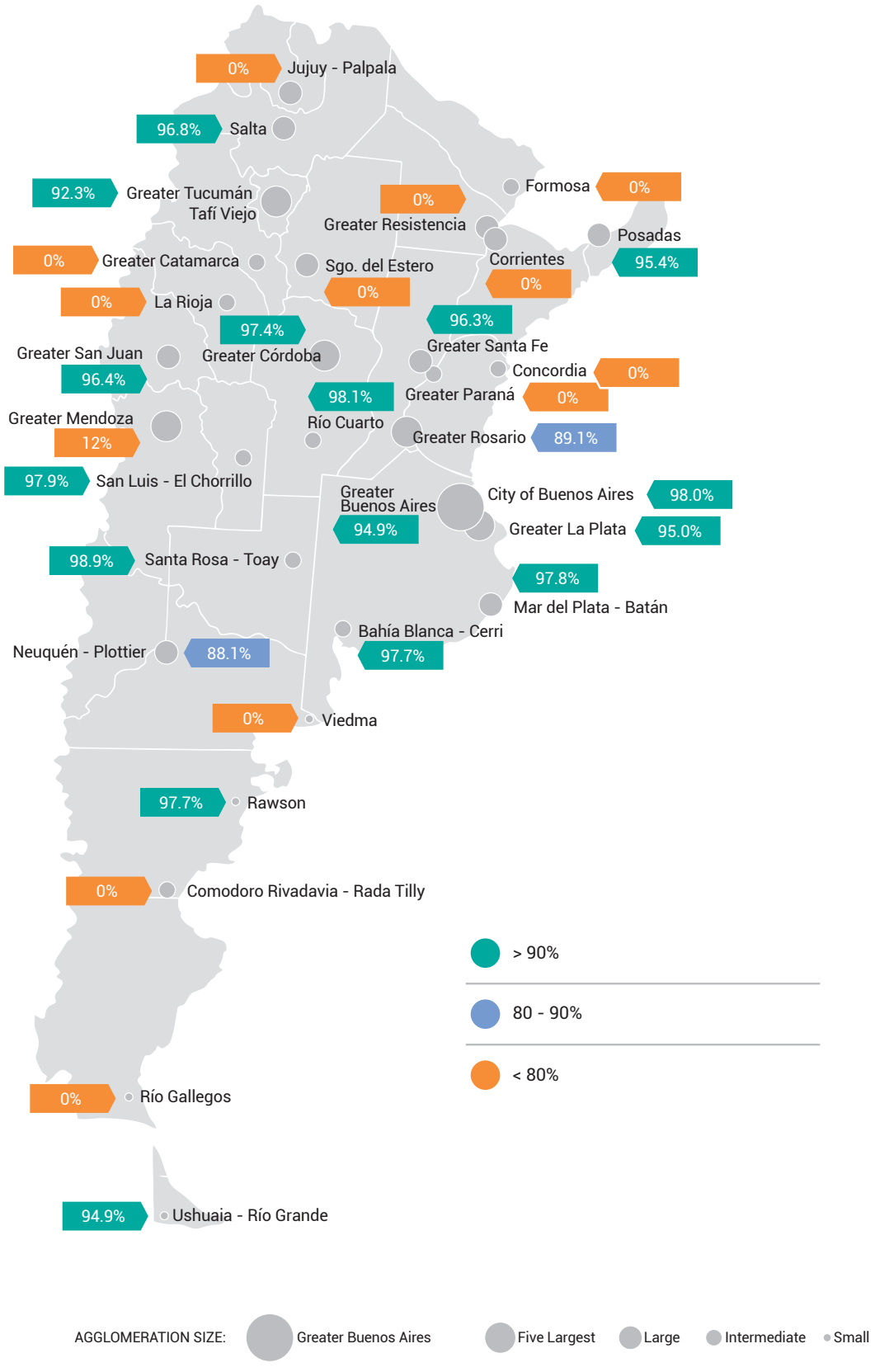
Table 19. Sanitary Landfills, 2015, by Urban Agglomeration

Agglomeration	Landfill	Municipalities	Waste Landfilled (tons per day)	Estimated population served
Greater Buenos Aires	CEAMSE - Norte III CEAMSE – Gonzalez Catan	The City of Buenos Aires, La Plata, and the 34 urban centers ('partidos') from Greater Buenos Aires	13,942	13,169,699
Greater La Plata	CEAMSE - Ensenada		628	787,490
Bahia Blanca - Cerrito	Bahia Blanca	Bahía Blanca	230	299,107
Mar del Plata- Batan	Mar del Plata	Gral Pueyrredón	1,100	617,657
San Nicolas-Villa	San Nicolás	San Nicolás	120	181,995
Greater Resistencia	Ricardone	10 municipalities from Greater Rosario	1,500	1,262,641
Greater Santa Fe	Santa Fe	Santa Fe and small municipalities (San José del Rincón, Arroyo Leyes, and Santa Rosa de Calchines)	500	507,071
Greater Cordoba	Greater Cordoba	City of Cordoba and 17 municipalities	1,960	1,473,801
Greater Cordoba	Rio Cuarto	Rio Cuarto	180	168,086
Santa Rosa-Toay	Santa Rosa	Santa Rosa	140	123,190
San Luis- El Chorillo	Capital	San Luis City	20	13,333
Greater San Juan	San Juan	San Juan Capital, Rawson, Rivadavia, Chimbas, Santa Lucia, Pocito, Ullum, Zonda, and Albardón,	550	493,558
Greater Salta	San Javier	Salta Capital City and cities of the Greater Salta Metropolitan Area	750	597,680
La Rioja	Villa Unión	Villa Unión	15	16,667
Posadas	Posadas	Posadas	160	334,832
Neuquén-Plottier	Neuquén	Neuquén	300	268,392
Rawson-Trelew	Ex Torre Omega	Puerto Madryn, Trelew, Dolavon, Gaiman, and Rawson	120	133,993
Ushuaia-Rio Grande	Ushuaia	Ushuaia	120	136,168
Total			**22,335**	**20,585,360**
Percentage of total in the 31 main urban agglomerations[1]			**77.0**	**77.0**

Source: Own elaboration based on information provided through publically available information, by the National Urban Solid Waste Management Project (MAyDS) and by municipal representatives, 2015. Population from which waste is collected and disposed by a particular landfill is based on National Census, 2010 data using the regional waste collection rates of EVAL, 2010.

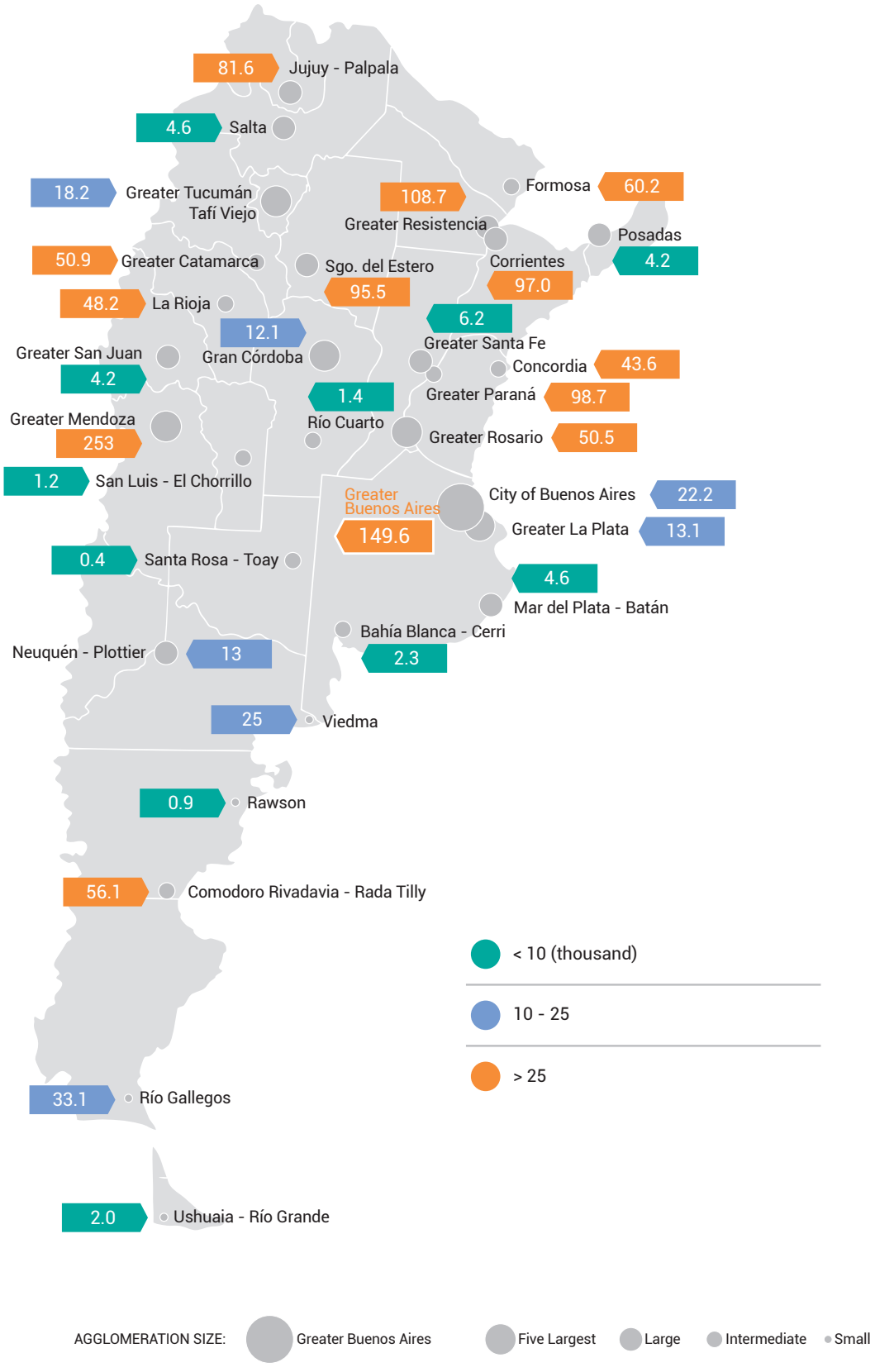
[1] The total solid waste generated in the 31 main urban agglomerations is 28,997 tons/day. The total waste and population in the 31 main urban agglomerations was estimated based on average of 1.085 kg of waste per person per day (the average generation of waste for the population from which waste was collected and disposed in sanitary landfills in the 31 main urban agglomerations derived from this report) and a total population of 26,725,120 inhabitants (National Census 2010, projection for 2014).

Figure 12.
Percentage of Households with Sanitary Landfill Waste Disposal Service, 2015, by Urban Agglomeration



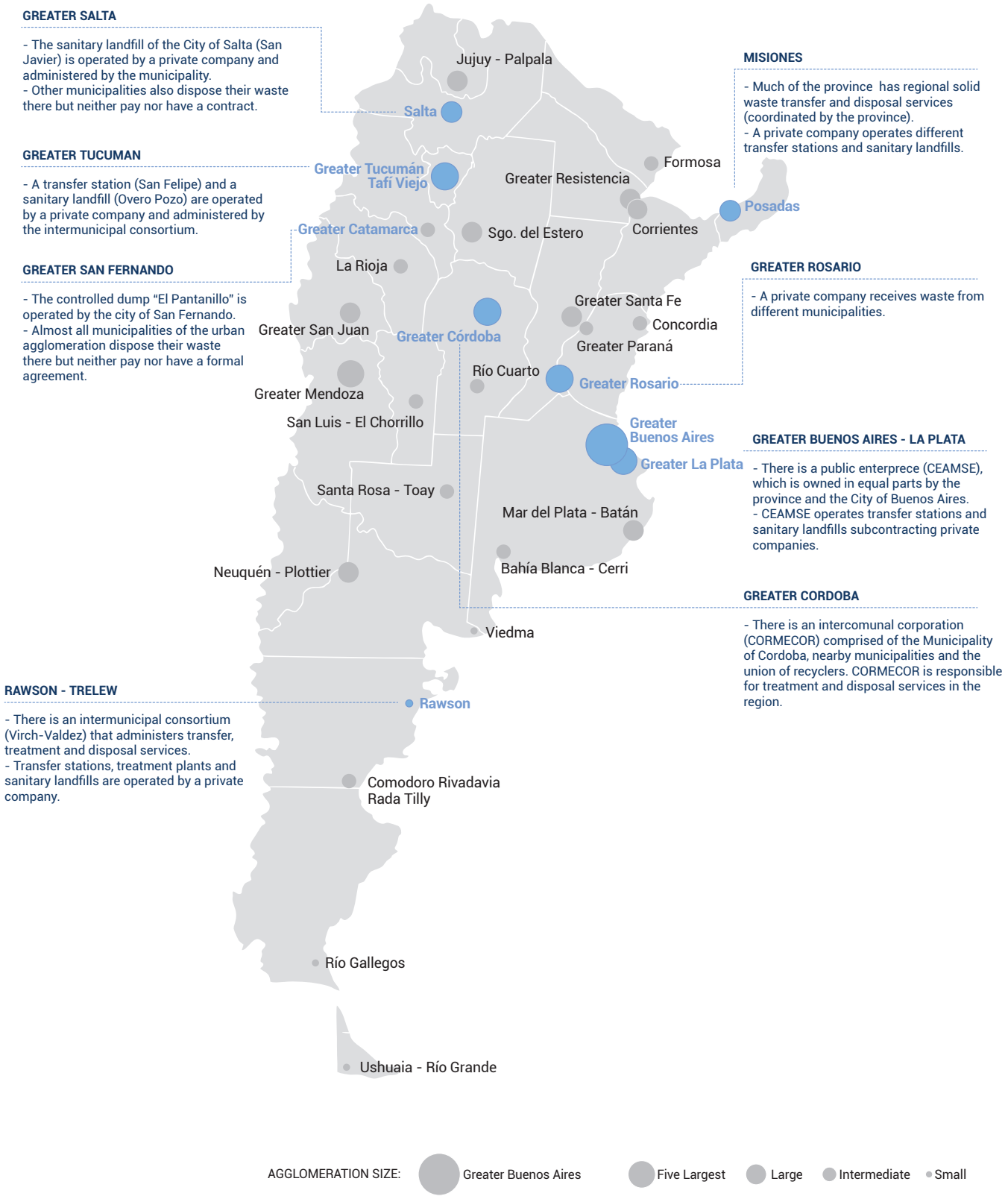
Source: National Census 2010.
Urban Agglomeration Categories: Greater Buenos Aires, five largest agglomerations (700,000–1.5 million), large agglomerations (300,000–700,000), intermediate agglomerations (100,000–300,000), and small agglomerations (50,000–100,000).

Figure 13.
Quantity (in thousands) of Households Without Sanitary Landfill Waste Disposal Service, 2015, by Urban Agglomeration



Source: National Census 2010..
Urban Agglomeration Categories: Greater Buenos Aires, five largest agglomerations (700,000–1.5 million), large agglomerations (300,000–700,000), intermediate agglomerations (100,000–300,000), and small agglomerations (50,000–100,000).

Figure 14.
Selected Regional Waste Management Facilities in the 31 Main Urban Agglomerations



Source: Own elaboration based on public information and information from operators and municipalities.
Urban Agglomeration Categories: Greater Buenos Aires, five largest agglomerations (700,000–1.5 million), large agglomerations (300,000–700,000), intermediate agglomerations (100,000–300,000), and small agglomerations (50,000–100,000).

Data analysis

- An estimated 53.5 percent of the country's population has sanitary landfill waste disposal service. In EVAL 2010, the proportion of the population with this service was estimated to be 64.7 percent. Possible reasons for this discrepancy include: (a) between 2010 and 2015, there was an important reduction in amount of waste sent to landfills by the City of Buenos Aires due to the development of recycling strategies; (b) there was population growth so the same capacity now covers a lower percentage of population; and/or (c) there are differences in the methodologies used.

- 89 percent of the landfill capacity in the country is located in the 31 main urban agglomerations and this capacity is able to service 77 percent of the population of these urban agglomerations.

- The City of Buenos Aires and 17 out of the 23 provinces have at least one sanitary landfill in operation. Notable exceptions are the provinces of Santa Cruz, Corrientes, Catamarca, Jujuy, Chaco, and Formosa.

- 18 of the 31 main urban agglomerations have at least one sanitary landfill. Five urban agglomerations in the northern part of the country (Jujuy-Palpala, Greater Resistencia, Santiago del Estero-La Banda, Greater Catamarca, and Corrientes) do not have a sanitary landfill.

- Some provinces have been successful in promoting regional landfills. For example, Misiones has developed a system based on 25 waste transfer stations and two sanitary landfills that services a large portion of the province.

- Large landfills are commonly operated by private companies (e.g., Mar del Plata, Greater Tucumán, Greater Cordoba, and Rosario) and small landfills are commonly operated mainly by municipalities (e.g., Malargue, Alvear, El Bolson).

- Regional landfills also have private operators. In Virch-Valdez, Chubut; the Eastern Zone of Mendoza (under construction in 2016); and Greater Tucumán a consortium is in charge of supervising the operation of the system by a private company. In the case of Greater Buenos Aires, a public company is in charge of the operation and they subcontract private companies.

- Manual sanitary landfills are not common.

6. *People living near open dumpsites*

6. People living near open dumpsites

8.7 percent of urban households in the country are located within three blocks of an open dumpsite. Similarly, 8.8 percent of households in the 31 main urban agglomerations are located within three blocks of an open dumpsite.

19.4 percent of urban households consider open dumpsites a problem in their neighborhood. This number is 58.6 percent for households located in informal settlements or precarious urban settlements.

A person living in an informal settlement or precarious urban settlement is much more likely to live within three blocks of an open dumpsite. 39.5 percent of households in an informal urban settlement are located within three blocks of an open dumpsite.

There are differences in proximity to open dumpsites among socio-economic levels. 5.9 percent of households from the medium-high socioeconomic strata consider open dumpsites a problem in their neighborhood while this number increases to 34.7 percent for the very low socioeconomic strata.

Between 2010 and 2015, there was no significant change in people living near open dumpsites. For the country overall, both the percentage of total urban households that considered open dumpsites a problem in their neighborhood and percentage of urban households within three blocks of an open dumpsite did not change significantly in any of the surveys.

335,462 children in Greater Buenos Aires live within three blocks of an open dumpsite.

6.1 The Survey of Argentina's Social Debt (EDSA)

Survey of Argentina's Social Debt (EDSA) is performed by the 'Observatory of Argentina's Social Debt', a research department in the Catholic University of Argentina (UCA). The observatory has been carrying out surveys in urban agglomerations since 2004. The last survey included the metropolitan area of Buenos Aires and 16 other urban agglomerations, with a sample size of 5,700.

The section of the survey that analyzes quality of life takes into account the proximity of a household to open dumpsites by including the question "In your neighborhood, do you have problems with open dumpsites?". It is worth highlighting that the results are based on the respondent's perception. The survey allows disaggregation of this statistic for households located in informal or precarious urban settlements (includes "villas" or slums, and precarious settlements) and evaluates proximity of households to open dumpsites for different socioeconomic groups, based on their education levels, housing conditions, structure of the family, and urban agglomerations.

Table 20. Urban Households that Consider Open Dumpsites a Problem in Their Neighborhood, 2010-2015

	2010	2011	2012	2013	2014	2015
All urban households (%)	19.2	20.0	20.6	18.1	18.5	19.4
Urban households located in informal or precarious urban settlements[1](%)	58.8	59.0	62.1	65.4	57.6	58.6

Source: EDSA-Bicentenario, 2010-2016 (data up to 2015), Observatorio de la Deuda Social Argentina, UCA.
[1] Includes "villas" (slums) and precarious settlements.

Table 21. Urban Households that Consider Open Dumpsites a Problem in their Neighborhood, 2015, by Urban Agglomeration, Social Stratum and Residential Condition

Urban Agglomeration					Social Stratum				Residential Condition		
All Urban Areas	City of Buenos Aires	Greater Buenos Aires	Other Metropolitan Areas	Other Urban Areas	Very Low	Low	Medium Low	Medium High	Informal or Precarious Urban Settlements[1]	With urban layout; low social strata	With urban layout; medium-high social strata
19.4	7.1	20.5	23.7	23.9	34.7	22.6	14.1	5.9	58.6	30.2	4.9

Source: EDSA-Bicentenario, 2010-2016 (data up to 2015), Observatorio de la Deuda Social Argentina, UCA
[1]Includes "villas" (slums) and precarious settlements.

Table 22. Urban Households that Consider Open Dumpsites a Problem in Their Neighborhood, 2015, by Economic-occupational Stratum and Characteristics of Head of Household

Economic – Occupational				Head of Household							
				Gender		Education		Employment status			
Marginal Working Class	Working Class	Middle Class Non-professional	Middle Class Professional	Male	Female	With Secondary Education	Without Secondary Education	Regular	Precarious	Under/ Unemployed	Inactive
28.0	24.2	14.9	3.9	20.1	17.5	12.4	27.0	14.5	22.9	29.1	29.7

Source: EDSA-Bicentenario, 2010-2016 (data up to 2015), Observatorio de la Deuda Social Argentina, UCA

Data analysis

- The proximity of households to open dumpsites is a common problem in urban areas in Argentina, and this problem is significantly worse in informal or precarious urban settlements. In 2015, 19.4 percent of respondents from urban households replied that open dumpsites were a problem in their neighborhood, and this number increased to 58.6 percent when only considering the responses of those living in informal or precarious urban settlements.

- Between 2010 and 2015, there was not a significant change in the percentage of households that consider open dumpsites a problem in their neighborhood.

- Between 2010 and 2015 there was, similarly, no significant change in the households located in informal or precarious urban settlements that consider open dumpsites a problem in their neighborhood.

- The percentage of households located in low economic strata neighborhoods but with an urban layout (areas with well-defined plots, roads and blocks and therefore not considered informal or precarious urban settlements) that consider dumpsites a problem in their neighborhood is higher than the overall average (30.2 percent versus the national average of 19.4 percent in 2015), but much lower than for households located in informal or precarious urban settlements (58.6 percent).

- The City of Buenos Aires has a significantly lower proportion of households that consider open dumpsites a problem in their neighborhood.

- People with lower educational attainment and from lower socioeconomic strata are more likely to consider open dumpsites a problem in their neighborhood. In 2015, 27.0 percent of households with a head of household without secondary school education consider open dumpsites a problem in their neighborhood, while this number decreases to 12.4 percent when the head of household has at least a secondary education. Similarly, 5.9 percent of households from the medium-high socioeconomic strata consider open dumpsites a problem in their neighborhood while this number increases to 34.7 percent for the very low socioeconomic strata.

- Households from a lower socioeconomic strata more commonly consider open dumpsites a problem in their neighborhood than those from a higher socioeconomic strata even when the neighborhood has a formal urban layout. 30.2 percent of households with an urban layout from the low socioeconomic strata consider open dumpsites a problem in their neighborhood.

6.2 **Permanent Survey of Households** (EPH)

INDEC undertakes surveys in the 31 main urban agglomerations every quarter. The survey takes into account all provincial capitals and urban agglomerations with more than 100,000 inhabitants, which comprise more than 70 percent of Argentina's urban population. The EPH evaluates if there is an open dumpsite three blocks or less from the household and allows for comparison across years and type of household. The survey provides specific information for households located in informal settlements (the survey refers to "villas de emergencia", or slums).

Table 23. Proportion of Urban Households within Three Blocks of an Open Dumpsite, 2010-2014

	2010	2011	2012	2013	2014
All urban households (%)	8.0	7.8	6.8	7.2	8.7
Urban households located in informal urban settlements[1] (%)	25.4	38.2	40.6	37.2	39.5

Source: Own elaboration based on data from EPH for the second quarter, 2010-2014.
[1] The survey refers to "villas de emergencia" (slums).

Table 24. Children Living within Three Blocks of an Open Dumpsite, 2014

	Age			Total	% of Total Children
	0 to 4	5 to 9	10 to 14		
In the 31 main urban agglomerations	209,108	237,366	201,616	**648,090**	9.9
In Greater Buenos Aires	111,460	128,815	95,187	**335,462**	11.9

Source: Own elaboration based on EPH, fourth quarter 2014.

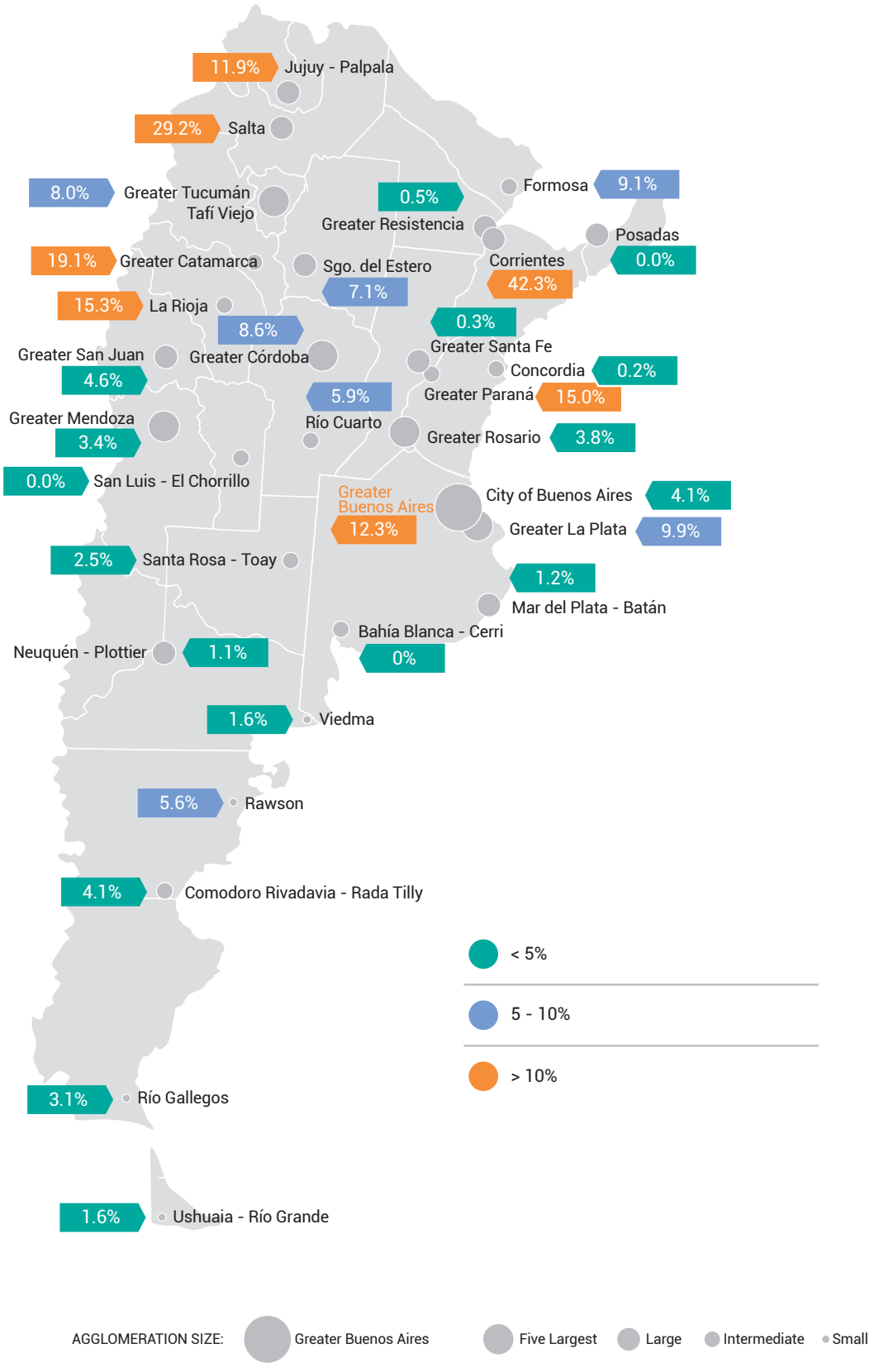
Table 25. Percentage of Households Located within Three Blocks of an Open Dumpsite, 2013-2014, by Urban Agglomeration

Urban Agglomeration	Population	Households Within Three Blocks of an Open Dump-site (%)[1]	Number of Households Within Three Blocks of an Open Dump-site[1]	Number of Persons Within Three Blocks of an Open Dump-site[1]	Percentage of Households Located in In-formal Urban Settlements[3]	Percentage of Households Located in Informal Urban Settlements Within Three Blocks of an Open Dumpsite[3]	Percentage of Households not located in Informal Urban Settlements Within Three Blocks of an Open Dump-site[3]
Greater Buenos Aires							
City of Buenos Aires	2,981,781	4.1	48,693	122,551	0.5	52.2	8.2
Other areas of Greater Buenos Aires	10,796,415	12.3	379,946	1,331,198	1.0	22.8	12.2
Cuyo							
Greater Mendoza	1,070,944	3.4	10,705	36,626	0.9	77.1	2.7
Greater San Juan	511,625	4.7	6,243	23,791	1.3	100.0	5.0
San Luis - El Chorrillo	215,487	0.08	49	172	0.08	100.0	0.0
Northeast							
Corrientes	379,696	42.3	47,414	160,763	0.9	100.0	41.8
Formosa	254,702	9.1	5,787	23,178	0.9	75.8	8.5
Greater Resistencia	407,001	0.6	619	2,279	3.1	0.0	0.6
Posadas	350,913	0.09	93	316	2.4	0.0	0.1
Northwest							
Greater Catamarca	209,072	19.1	10,979	39,975	0.2	100.0	11.8
Greater Tucumán - Tafí Viejo	863,943	8.0	18,737	69,375	0.6	61.7	10.2
Jujuy – Palpalá	335,406	12.0	9,866	40,148	0.3	100.0	11.7
La Rioja	200,933	15.4	8,553	30,843	0.6	100.0	19.0
Salta	617,418	29.2	45,965	180,286	1.6	56.2	27.4
Santiago del Estero - La Banda	401,924	7.1	7,578	28,697	0.3	100.0	26.4
Pampeana/Central Region							
Bahía Blanca – Cerrito	305,962	0.0	0	0	0.2	100.0	1.4
Concordia	159,631	0.3	138	447	0.7	0.0	4.0
Greater Córdoba	1,512,823	8.7	41,260	131,162	1.3	50.2	8.1
Greater La Plata	828,860	9.9	28,731	82,140	0.4	100.0	9.6
Greater Rosario	1,415,628	3.9	18,466	54,643	2.8	73.8	1.9
Greater Paraná	273,300	15.0	13,361	41,104	0.8	100.0	14.3
Greater Santa Fe	526,366	0.4	611	2,000	0.3	0.0	0.4
Mar del Plata – Batán	631,322	1.3	2,943	8,081	0.0	0.0	1.3
Río Cuarto	171,332	6.0	3,616	10,246	3.6	74.3	3.5
Santa Rosa – Toay	124,545	2.5	1,156	3,139	0	0.0	2.6
San Nicolás - Villa Constitución	187,981	0.5	262	846	1.1	21.5	0.2

Urban Agglomeration	Population	Households Within Three Blocks of an Open Dump-site (%)[1]	Number of Households Within Three Blocks of an Open Dump-site[1]	Number of Persons Within Three Blocks of an Open Dump-site[1]	Percentage of Households Located in In-formal Urban Settlements[3]	Percentage of Households Located in Informal Urban Settlements Within Three Blocks of an Open Dumpsite[3]	Percentage of Households not located in Informal Urban Settlements Within Three Blocks of an Open Dump-site[3]
Patagonia							
C. Rivadavia - Rada Tilly	210,875	4.2	2,756	8,815	0.3	0.0	4.2
Neuquén – Plottier	304,572	1.1	1,074	3,411	0.4	0.0	1.1
Río Gallegos	108,693	3.1	1,021	3,391	0.6	100.0	0.7
Ushuaia - Río Grande	143,471	1.7	744	2,396	1.2	100.0	0.4
Rawson – Trelew	137,057	5.7	2,553	7,757	0.0	0.0	5.7
Viedma - C. de Patagones	85,442	1.6	475	1,401	0.0	0.0	1.6
Total for the 31 main urban agglomerations	**26,725,120**	**8.84[4]**	**720,394**	**2,451,178**	**1.2**	**39.54[4]**	**8.5**

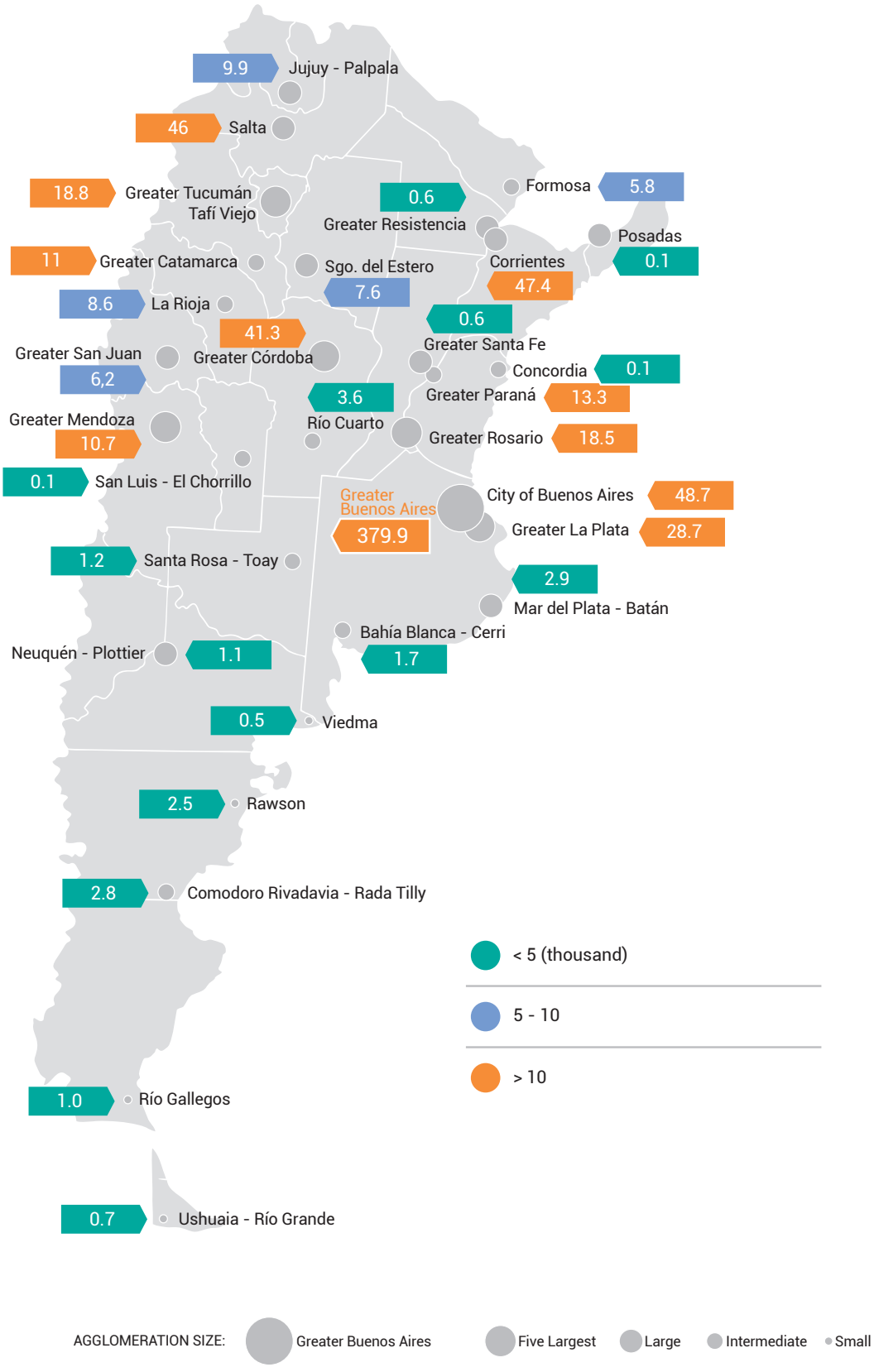
Source: Own elaboration based on Permanent Survey of Households information.
[1] Data from EPH, second quarter 2014.
[2] Data from EPH, fourth quarter 2014.
[3] Includes "villas de emergencia" (slums). For some urban agglomerations the percentage of households in informal urban settlements was zero. In those cases, instead of using information from second quarter2014, available data from other quarters in 2013 and 2014 were used.
[4] Information from EPH second quarter, 2014.

Figure 15.
Percentage of Households Located within Three Blocks of an Open Dumpsite, 2013-2014, by Urban Agglomeration



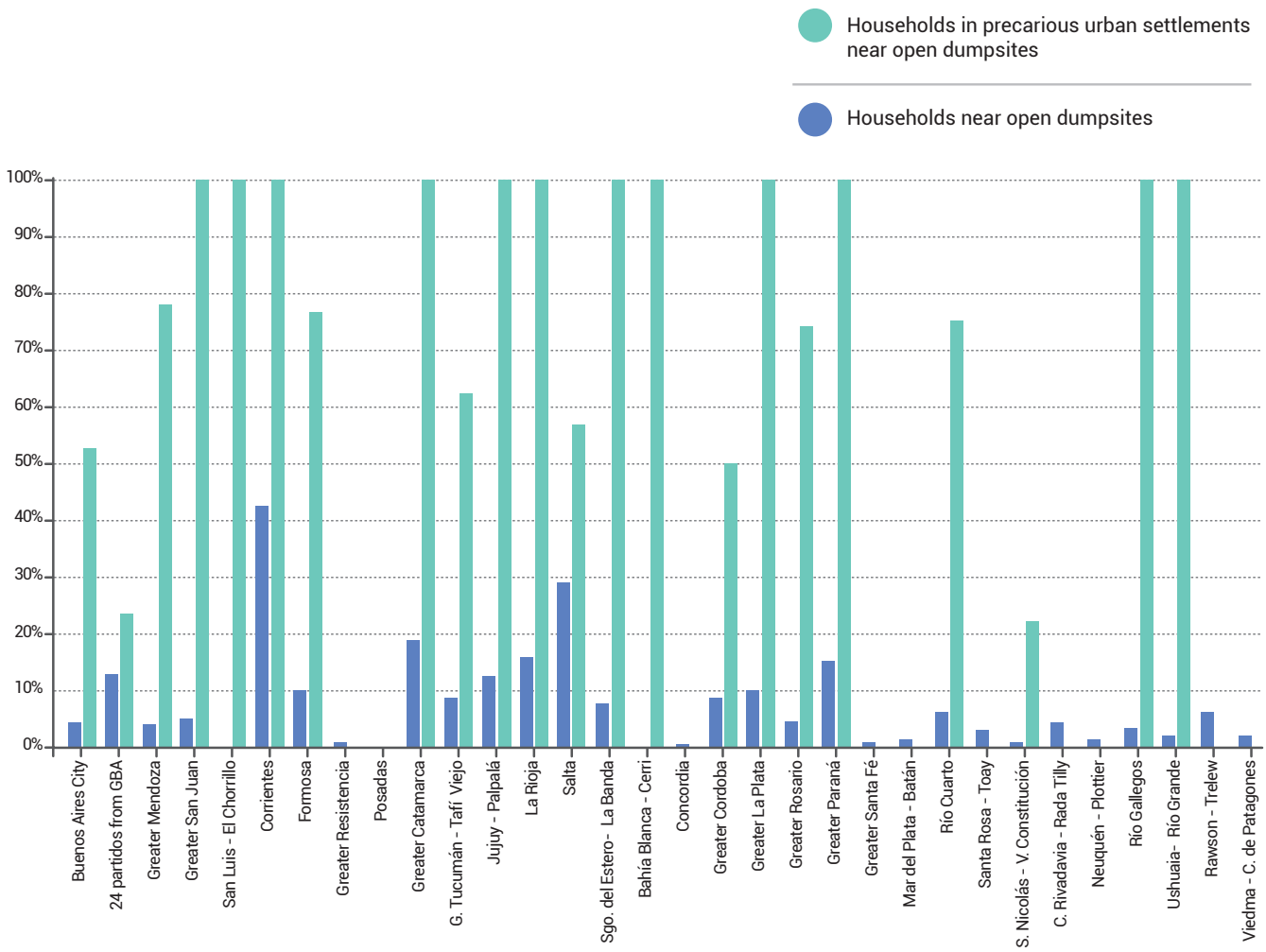
Source: Own elaboration based on Permanent Survey of Households, 2013-2014.
Urban Agglomeration Categories: Greater Buenos Aires, five largest agglomerations (700,000–1.5 million), large agglomerations (300,000–700,000), intermediate agglomerations (100,000–300,000), and small agglomerations (50,000–100,000).

Figure 16.
Quantity (in Thousands) of Households Located within Three Blocks of an Open Dumpsite, 2013-2014, by Urban Agglomeration



Source: Own elaboration based on Permanent Survey of Households, 2013-2014.
Urban Agglomeration Categories: Metropolitan Buenos Aires, top five agglomerations (700,000–1.5 million), large agglomerations (300,000–700,000), intermediate agglomerations (100,000–300,000), and small agglomerations (50,000–100,000).

Figure 17.
Percentage of Households Located within Three Blocks of an Open Dumpsite, 2013-2014, by Urban Agglomeration, for All Households and Those in Precarious Urban Settlements



Source: Own elaboration based on, EPH-INDEC, 2013-2014.Precarious urban settlements include "villas de emergencia" (slums).

Data analysis

- 8.7 percent of urban households are located within three blocks of an open dumpsite.

- There was not a significant change in the percentage of urban households living within three blocks of an open dumpsite between 2010 and 2014. For households located in informal urban settlements, there were fluctuations, with the lowest numbers in 2010 and more consistent numbers between 2011 and 2014.

- In the 31 main urban agglomerations, 9.9 percent of children (ages 0 to 14 years) live within three blocks of an open dumpsite and 51.8 percent of these children live in Greater Buenos Aires, where a total of 335,462 of children are estimated to live within three blocks of an open dumpsite.

- There are important differences between urban agglomerations in terms of the percentage of households located within three blocks of an open dumpsite, with the highest percentages found in provinces in the Northern region: Corrientes (42.3 percent), Greater Catamarca (19.1 percent), La Rioja (15.4 percent), and Salta (29.2 percent).

- In Greater Buenos Aires, the percentage of households located within three blocks of an open dumpsite (12.3 percent) is slightly above the national average (8.7 percent). This represents the 1,331,198 people which is the highest absolute number of people that live within three blocks of an open dumpsite of any of the 31 main urban agglomerations.

6.3 **Annual Survey of Urban Households (EAHU)**

In addition to the EPH, INDEC carries out an Annual Survey of Urban Households (EAHU) every year in those urban municipalities with more than 2,000 inhabitants. The questionnaire is very similar to the one used in the EPH. The interviewer, based on the survey results, evaluates whether the household is within three blocks of an open dumpsite and the survey includes more and a larger proportion of the smaller municipalities than the EPH.

Table 26. Percentage of Households Located Within Three Blocks of an Open Dumpsite, 2010-2013

	2010	2011	2012	2013
Urban Households (%)	6.6	6.6	6.7	6.4
Households in Informal Urban Settlements[1] (%)	30.4	33.5	33.7	34.9

Source: Own Elaboration based on information from EAHU, 2010-2013.
[1] Informal urban settlements includes 'villas de emergencia' (slums)

Data analysis

- The percentage of households living within three blocks of an open dumpsite has remained almost constant between 2010 and 2013.

6.4 **Comparison between EPH, EAHU, and EDSA Results**

Table 27. Percentage of Households Located Within Three Blocks of an Open Dumpsite, 2013

Survey (2013)	Indicator	Urban Households near Open Dumpsites (%)	Urban Households Located in Informal or Precarious Urban Settlements that are Near Open Dumpsites[1](%)
EDSA	The respondent is asked whether "in their neighborhood there is a problem with open dumpsites?"	18.1	65.4
EPH	Within three blocks of an open dumpsites	7.2	37.2
EAHU		6.4	34.9

Source: Own elaboration based on information from EAHU, 2013; EPH, 2013; and EDSA, 2013.
[1] EAHU and EPH includes informal settlements or "villas de emergencia" (slums). EDSA includes informal settlements ("villas") and precarious settlements.

Data analysis

- The EDSA reports higher values than the EPH and the EAHU. This is consistent with the methodological differences of the surveys, as the EPH and EAHU indicate when the household is within three blocks of an open dumpsite, where as the EDSA asks the respondent, more generally, if in the neighborhood where he/she lives open dumpsites are a problem.

- The EDSA and EPH both indicate that the percentage of households near open dumpsites dramatically increases among households located in informal or precarious urban settlements.

- The percentage of households located in informal settlements that are within three blocks of an open dumpsite is higher in the EAHU than in the EPH implying that in smaller municipalities there is higher prevalence of precarious urban settlement households that are within three blocks if an open dumpsite.

7. *Municipal performance in solid waste management*

7. Municipal performance in solid waste management

Municipal performance in solid waste and city cleaning services is relatively low. When applying a set of systematic performance criteria covering institutional-legal, technical, social, environmental, and economic-financial aspects to 73 municipalities in 3 provinces in Argentina, on average municipalities complied with 35 percent of the criteria.

The surveyed municipalities have better performance for the social and institutional-legal aspects of solid waste management and city cleaning services. The lowest performance was found for the economic-financial and environmental criteria.

Environmental problems with waste disposal sites are common. 74 percent of the surveyed municipalities experience burning in the disposal site; 82 percent of the analyzed municipalities have domestic animals in the waste disposal site; 81 percent have waste outside the disposal site; and only 4 percent practice vector control.

A large proportion of the surveyed municipalities have informal waste workers working in the streets (41 percent of the municipalities) and at the waste disposal site (73 percent).

Larger municipalities on average perform better than smaller municipalities in solid waste and city cleaning services. This is particularly true for many of the institutional-legal criteria.

The National Urban Solid Waste Management Project (MAyDS) undertook a diagnostic in three Argentine provinces. A database on performance in solid waste management in these three provinces was developed in 2014 and includes information on the solid waste management systems of 73 municipalities from these three Argentine provinces. The goal was to quantify the performance of each municipality including the institutional-legal, technical, social, environmental, and economic-financial aspects of their solid waste management system using a range of criteria. The data was gathered through consultants that undertook field visits and is based on data provided by the municipalities and visual inspection undertaken by the consultants whenever possible. The municipalities included the capital city of the province and all the municipalities with more than 10,000 inhabitants. At least 70 percent of the municipalities with less than 10,000 inhabitants had to be visited.

Table 28. Performance of Municipalities in Solid Waste Management and Cleaning Services, 2014, Level of Compliance with Performance Criteria

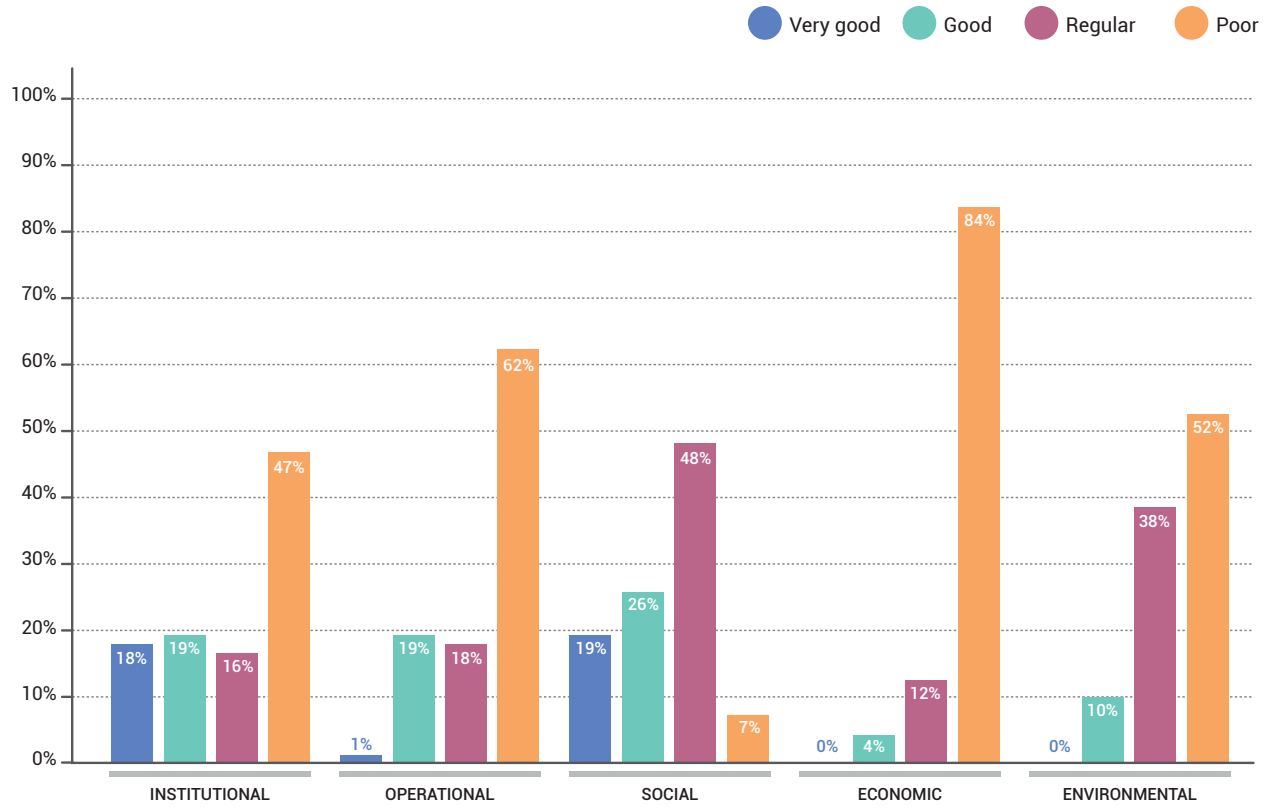
Category	Criteria	Municipality Size			
		> 50,000 (%)	10,000-50,000 (%)	< 10,000 (%)	Overall (%)
Institutional Legal	Bylaw on solid waste management	80	48	26	42
	Government department for solid waste management	90	52	6	35
	Government department able to receive complaints	70	7	11	18
	Land use plan approved	40	31	11	23
	Ownership of the property used for final disposal	100	93	77	86
	Institutional Legal Performance	**76**	**46**	**27**	**50**

Category	Criteria	Municipality Size			
		> 50,000 (%)	10,000-50,000 (%)	< 10,000 (%)	Overall (%)
Operational	Studies on generation and/or characterization of solid waste	40	10	0	9
	Source separation	50	31	6	22
	Collection system with universal service coverage	80	83	91	86
	Differentiated collection systems	50	24	6	19
	Street sweeping service	100	100	77	89
	Sorting plant	30	52	9	28
	Sanitary landfill	10	7	0	4
	Access control at disposal site	70	52	14	36
	Record of solid wastedisposed	30	7	3	8
	Absence of illegal dumpsites	0	34	23	24
	Recycling programs	80	59	20	43
	Operational Performance	**49**	**42**	**23**	**38**
Social	Delivery of personal protective elements to the staff	50	31	40	38
	Absence of informal waste workers at the disposal site	10	24	34	27
	Absence of informal waste workers' houses at the disposal site	80	90	89	88
	Absence of informal waste workers in the street	60	69	51	59
	Absence of housing adjoining the disposal site	80	90	71	80
	Awareness programs forsolid waste management	70	66	20	45
	Social Performance	**58**	**61**	**52**	**57**
Economic Financial	Solid waste management costs are included in budget planning	50	14	0	12
	Specific tariffs for solid waste	20	3	11	9
	Differential rates for large generators	70	10	17	22
	Collected taxes are enough to cover 50% of expenditure on solid waste management	50	14	3	14
	Economic Financial Performance	**48**	**12**	**8**	**22**
Environmental	Approved environmental impact assessment	20	3	0	4
	Monitoring of soil quality	20	3	3	5
	Monitoring of water quality	20	7	3	7
	Monitoring of air quality	20	3	3	5

Category	Criteria	Municipality Size			
		> 50,000 (%)	10,000-50,000 (%)	< 10,000 (%)	Overall (%)
Environmental	Vector control	0	10	0	4
	Collection and leachate treatment system	0	3	0	1
	Distance from disposal site to water courses or bodies > 2 km	30	52	29	38
	Distance from disposal site to national protected areas > 10 km	80	83	77	80
	Distance from disposal site to tourist areas > 2 km	90	79	74	78
	Distance from disposal site to airports/aerodromes operating aircraft turbine engine > 3 km or piston/turboprop > 1.5 km	100	100	97	99
	No burning of solid waste is carried out	40	34	14	26
	Absence of solid waste outside the disposal site	10	38	6	19
	Absence of domestic and native fauna at the disposal site	10	34	6	18
	Environmental Performance	**34**	**35**	**25**	**31**
Overall performance		**53**	**39**	**27**	**35**
Overall performance for municipalities that have a bylaw and a government department for solid waste management		**/**	**/**	**/**	**52**

Source: Own elaboration based on National Urban Solid Waste Management Project, 2014, as cited in Campos and Pierrestegui, ISWA World Congress, 2014.

Figure 18.
Performance of Municipalities in Solid Waste Management and Cleaning Services, 2014, Level of Compliance with Criteria



Source: National Urban Solid Waste Management Project (MAyDS) as cited in Campos and Pierrestegui, ISWA World Congress, 2014.

Data analysis

- On average, municipalities comply with 35 percent of the performance criteria.

- On average, municipalities have better performance for the social (57 percent of the social performance criteria are complied with) and institutional-legal (50 percent) criteria, and the lowest performance was found for the economic-financial (22 percent) and environmental (31 percent) criteria.

- Some of the indicators in the environment category have averages as low as one percent including, for example, having: an approved environmental impact assessment; a monitoring system for soil, water and air, vector control, collection and leachate treatment systems; and anabsence of animals at the disposal site.

- 74 percent of the municipalities experience burning in the disposal site; 82 percent have domestic animals in the site; 81 percent have waste outside the disposal site; and only 4 percent practice vector control.

- The social performance indicators demonstrate that a large proportion of municipalities have informal waste workers in the streets (41 percent of the municipalities) or at the disposal site (73 percent). The use of personal protection equipment among the staff is low (38 percent) and only 45 percent of municipalities have public awareness programs forsolid waste.

- Only 9 percent municipalities have specific tariffs or fees for solid waste management and only 22 percent use different rates for large generators.

- The overall performance increases with the size of the municipality. Large municipalities, on average, comply with 53 percent of the performance criteria; medium-sized municipalities comply with 35 percent and small municipalities comply with 25 percent.

- For the institutional and financial-economic criteria in particular, the municipalities with more than 50,000 inhabitants have much higher compliance with the criteria. For example, 18 percent of all municipalities have an institutional department dealing with complaints, while for large municipalities this number is 70 percent, and for medium sized and small municipalities this number is 7 percent, and 11 percent respectively.

8. *Employment in the solid waste management sector*

8. Employment in the solid waste management sector

The solid waste management sector is an important source of both formal and informal employment providing an estimated 323,354 jobs in Argentina.

There is, on average, 21.2 municipal employees dedicated to solid waste management per 10,000 inhabitants which is similar to the average for the Latin America and the Caribbean Region (21.7 percent).

Smaller municipalities have proportionally larger quantities of municipal employees in solid waste management. There is an average of 105.7 employees per 10,000 inhabitants in municipalities of less than 15,000 people; an average of 34.0 for municipalities with populations between 15,000 and 50,000 inhabitants and an average of 22.6 for municipalities with populations between 50,000 and 300,000 inhabitants.

The number of informal workers in solid waste is also significant. Overall it is estimated there are 117,698 informal workers in the solid waste sector in the country and based on data from more than 60 municipalities, there is an average of 15.7 informal workers per 10,000 people.

Informal workers are more prevalent in the 31 main urban agglomerations. In the municipalities of the 31 main urban agglomerations, 60 percent of the workers in the sector are informal and for the municipalities outside of these urban agglomerations only 25 percent of the workers in the sector are informal.

8.1 Formal Jobs

Regional Evaluation of Municipal Solid Waste Management in Latin America and the Caribbean (EVAL)

In 2010 the IADB carried out a regional evaluation of the solid waste management sector in the Latin America and the Caribbean Region based on the information provided by a representative sample of municipalities. The data was further elaborated in a technical note in 2013 also published by the IADB. The assessment included an analysis of the number of formal employees in the sector. The figures in this section present information disaggregated by region and service and also provide, separately, the average numbers of municipal workers and workers contracted by the municipality. As the evaluation was undertaken in the whole Latin America and the Caribbean Region, EVAL allows comparison to averages for the Region.

Table 29. Formal Municipal Employment in Solid Waste Management, 2010, by Service (Employees per 10,000 inhabitants)

	Region I	Region II	Region III	Total Argentina	Latin America and the Caribbean Average
Manual street sweeping	10.2	5.6	4.8	5.8	5.6
Mechanized street sweeping	0.1	0.5	0.7	0.6	0.4
Wastecollection	5.4	7.6	5.6	5.9	4.7
Waste Transfer	—	0.5	0.6	0.6	1.5
Waste Treatment	—	2.6	2.5	2.5	2.7
Final disposal	3.8	2.3	1.6	1.9	1.5
Maintenance	—	16.7	0.5	0.8	1.0
Special services	1.8	7.3	1.4	2.4	3.1
Administrative staff	0.8	0.8	0.6	0.7	1.3
Total	**22.0**	**43.7**	**18.3**	**21.2**	**21.7**

Source: Own elaboration based on EVAL, 2010 and IADB Technical Note, 2013.
Region I: Provinces of Catamarca, Chaco, Formosa, Jujuy, La Rioja, Salta, Santiago del Estero, and Tucumán.
Region II: Provinces of Corrientes, Entre Ríos, Mendoza, Misiones, San Juan, and San Luis.
Region III: Provinces of Buenos Aires, Córdoba, Chubut, La Pampa, Neuquén, Río Negro, Santa Cruz, Santa Fe, Tierra del Fuego, and the City of Buenos Aires.

Table 30. Formal Municipal Employment in Solid Waste Management (Employees per 10,000 inhabitants), 2010, by Terms of Employment (Municipal versus Contractual), and Service

	Municipal	Contractual	Total
Manual street sweeping	3.0	2.8	5.8
Mechanized street sweeping	0.5	0.1	0.6
Waste collection	3.3	2.5	5.9
Waste transfer	0.3	0.3	0.6
Waste treatment	1.7	0.8	2.5
Final disposal	1.4	0.6	1.9
Maintenance	0.5	0.4	0.8
Special services	1.9	0.5	2.4
Administrative staff	0.5	0.1	0.7
Total	**13.1**	**8.1**	**21.2**

Source: Own elaboration based on EVAL, 2010 and IADB Technical Note, 2013.

Data analysis

- In Argentina, there is an average of 21.2 formal workers dedicated to solid waste management per 10,000 inhabitants, a similar number as the average for the Latin America and the Caribbean Region (21.7).

- Argentina has 14.2 formal workers per 10,000 inhabitants for sweeping, collection, and final disposal services which is a slightly higher number than the Latin America and the Caribbean regional average (12.2). Argentina uses a lower number of administrative and maintenance staff per 10,000 inhabitants (1.5) than the regional average (2.3).

- For almost all services, except for waste transfer stations, the number of municipal employees is higher than the average for contractual personnel. Overall, of the 21.2 employees per 10,000 inhabitants involved in solid waste management, 13.1 are municipal employees and 8.1 are contractual employees.

- The results show there are regional differences within the country. The number of employees per 10,000 inhabitants is twice as high in Region II as the other two regions in the analysis. This is due to the high reported number of staff for maintenance in this region.

National Urban Solid Waste Management Project (MAyDS) Database

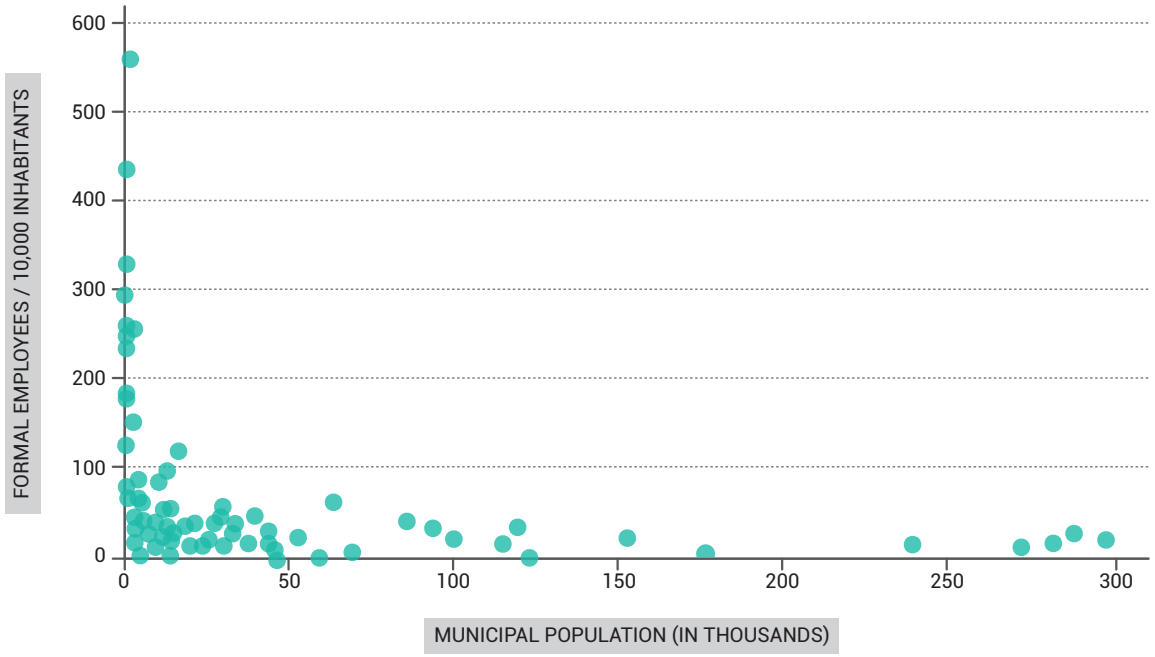
The National Urban Solid Waste Management Project (MAyDS) developed a tool to help municipalities estimate their solid waste management costs. Three-day workshops were carried out in different provinces between 2012 and 2014 to work with the municipalities to collect the data from over 85 Argentine municipalities in 11 different provinces including the number of formal employees working on solid waste management. The database not only estimates the number of employees, but also includes information on the time worked, as in small and medium municipalities it is a common practice to use this measure.

Table 31. Average number of Formal Employees in Solid Waste Management (Employees per 10,000 inhabitants), 2010-2014, by Municipality Size

Municipality size	Average number of employees per 10,000 inhabitants
0 - 15,000	105.7
15,001 - 50,000	34.0
50,001 - 300,000	22.6

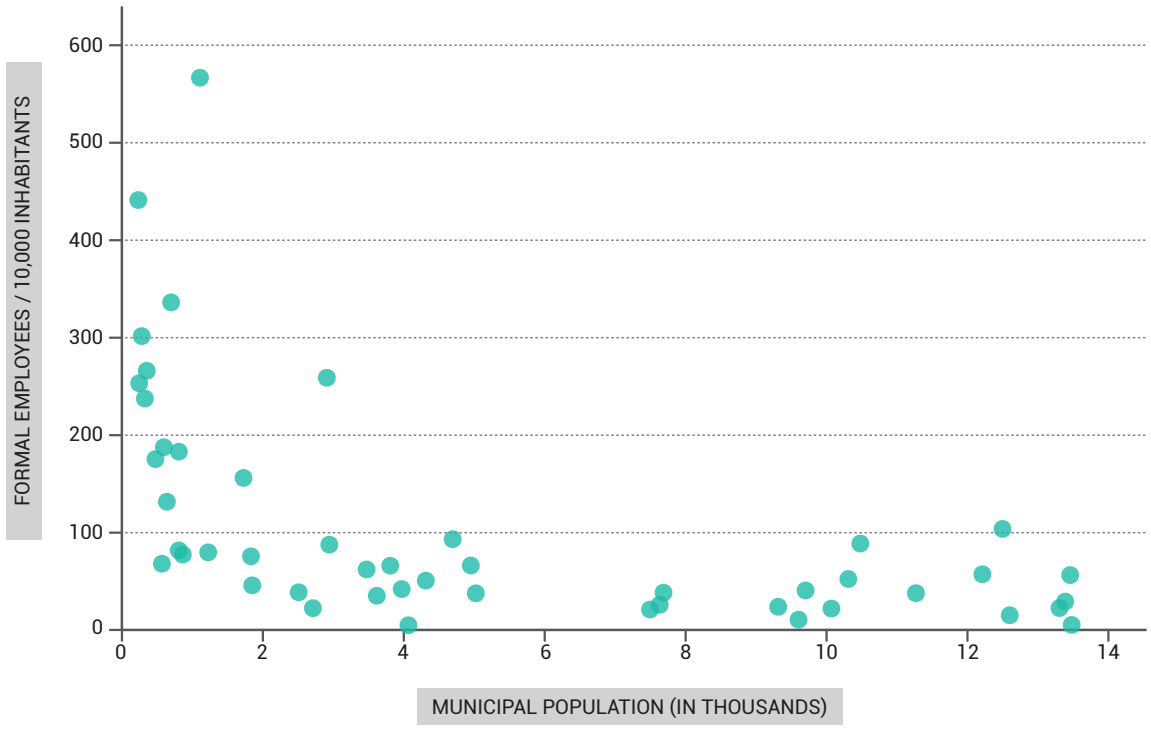
Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) database, 2012–2014.

Figure 19.
Formal Employees Working on Waste Management versus Municipality Size, 2012-2014



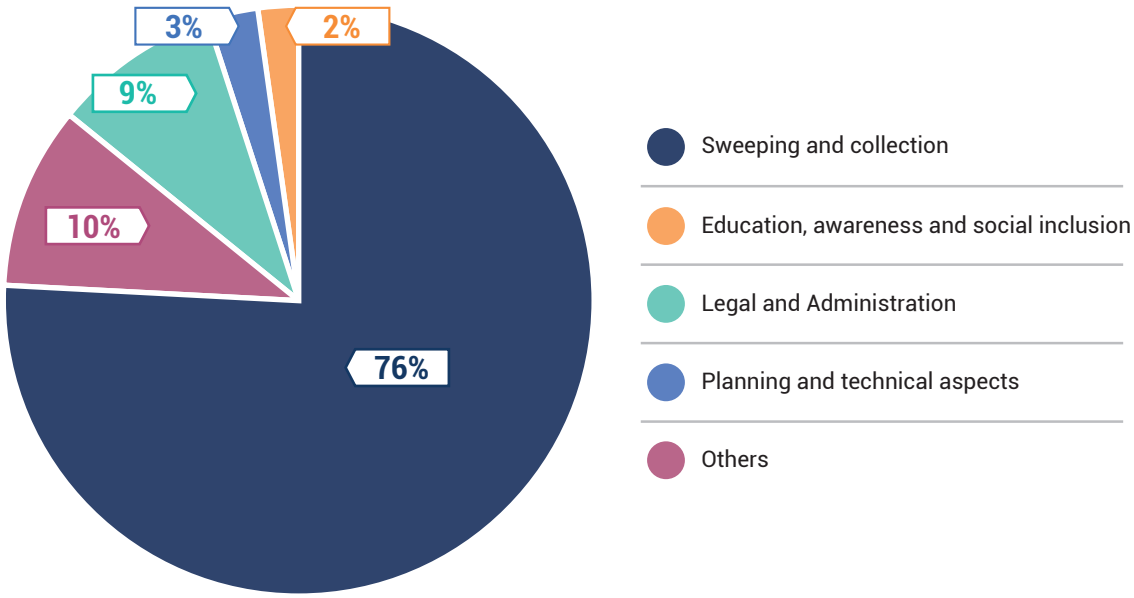
Source: Own elaboration based on National Urban Solid Waste Management Project (MAyDS) database, 2012–2014.

Figure 20.
Formal Employees Working on Waste Management versus Municipality Size for Municipalities with up to 15,000 Inhabitants, 2012-2014



Source: Own elaboration based on the National Urban Solid Waste Management Project (MAyDS) database, 2012–2014.

Figure 21.
Distribution of Formal Employees by Task, 2012-2014



Source: Own elaboration based on the National Urban Solid Waste Management Project (MAyDS) database, 2012–2014.

Data analysis

- The larger the municipality, the lower number of formal employees working on solid waste management relative to the municipal inhabitants. This number is particularly high in municipalities with less than 15,000 inhabitants (105.7 employees per 10,000 inhabitants).

- The number of employees per 10,000 inhabitants increases significantly (up to 500 formal workers per 10,000 inhabitants in some cases) and has more variability for municipalities with a population of less than 2,000 inhabitants while for municipalities with more than 3,000 inhabitants the number is smaller and more consistent, averaging approximately 100 formal workersper 10,000 inhabitants.

- Figure 21 shows that most employees (76 percent) are working on sweeping or collection of solid waste while tasks such as planning and education only employ a very small amount of workers.

8.2 **Informal Jobs**

Regional Evaluation of Municipal Solid Waste Management in Latin America and the Caribbean (EVAL)

In 2010 the IADB carried out a regional evaluation of the solid waste management sector in the Latin America and the Caribbean Region based on the information provided by a representative sample of municipalities. The assessment included an analysis of the number of informal workers in the sector by place of work (for example, in segregation plants; in the street; and in final disposal sites). The figures in this section present information disaggregated by region and service and also provide, separately, the average numbers of municipal workers and workers contracted by the municipality. As the evaluation was undertaken in the whole Latin America and the Caribbean Region, EVAL allows comparison to averages for the Region.

Table 32. Informal Waste Workers per 10,000 Inhabitants, 2010, by Region and Place of Work

	Informal waste workers per 10,000 Inhabitants					Total Number of Informal Waste Workers	
	Region I	Region II	Region III	Argentina	Latin America and the Caribbean	Argentina	Latin America and the Caribbean
In segregation plants	0.07	7.1	1.8	1.9	1.5	7,176	68,907
In the street	0.5	1.9	22.8	14.7	2.7	55,156	128,439
In final disposal sites	5.7	4.6	1.7	3.2	1.8	11,985	85,314
Other places	0	0.6	1.9	0.7	2.5	2,668	119,064
Total	**6.2**	**14.2**	**28.3**	**20.5**	**8.6**	**76,985**	**401,724**

Source: Own elaboration based on EVAL, 2010 and IADB Technical Note, 2013.
Region I: Provinces of Catamarca, Chaco, Formosa, Jujuy, La Rioja, Salta, Santiago del Estero, and Tucumán.
Region II: Provinces of Corrientes, Entre Ríos, Mendoza, Misiones, San Juan, and San Luis.
Region III: Provinces of Buenos Aires, Córdoba, Chubut, La Pampa, Neuquén, Río Negro, Santa Cruz, Santa Fe, Tierra del Fuego, and the City of Buenos Aires.

Data analysis

- In 2010, there was an estimated 76,985 informal waste workers in the country.

- The average number of informal waste workers per 10,000 inhabitants found by EVAL in 2010 for Argentina (20.5) is significantly higher than the average for the Latin America and the Caribbean Region (8.6).

- The number of informal waste workers per 10,000 inhabitants working on the streets is more than five times higher in Argentina relative to the average of the Latin America and the Caribbean Region (14.7 in Argentina versus 2.7 average in Latin America and the Caribbean).

- There are significant differences in informal solid waste workers per 10,000 inhabitants between regions with the lowest number found in Region I (6.2) and the highest in Region III (28.3).

- Regarding the places where informal waste workers recover material, the results show that most of them work in the streets.

Child Labor in Recovery and Recycling of Municipal Solid Waste, IOM-UNICEF

In 2006, the International Organization for Migration (IOM) and the United Nations Children's Emergency Fund (UNICEF) published a report on child labor in the recovery and recycling of solid waste. The report is based on an empirical work undertaken in the City of Buenos Aires, the Department ('partido') of Moreno (Province of Buenos Aires), and Posadas (Misiones Province) in the year 2004. The number of children and teenage workers that they obtained represent an estimated minimum, because they only consider the number of cases that could be counted through observation during the survey period.

Table 33. Child Labor among Informal Waste Workers, 2004

Municipality	Population (National Census 2010)	Total Number of Informal Waste Workers	Number of Informal Waste Workers Younger than 18 Years	Percentage of Children and Teenagers (%)	Informal waste workers per 10,000 Inhabitants
City of Buenos Aires	2,981,781	8,762	4,223	48	29.4
Moreno (Greater Buenos Aires)	462,242	950	412	43	20.6
Posadas	323,739	1,570	1,061	68	48.5

Source: Own elaboration based on IOM-UNICEF, 2006.

Data analysis

- In 2004, in the City of Buenos Aires there were 8,762 informal waste workers with 4,223 of them being children and teenagers.

- The City of Buenos Aires and Moreno in 2004 have similar numbers of informal workers as those found nationally by EVAL in 2010.

- Posadas has a significantly higher number of informal waste workers per 10,000 inhabitants in 2004 as those found nationally by EVAL in 2010.

- The absolute number of children and teenagers working informally on solid waste sector and the proportion of the informal waste workers they represent is high in these three municipalities.

Data on informal jobs in the solid waste sector from sector, project, municipal and provincial studies and plans.

To estimate the importance of solid waste as a source of informal jobs in a more comprehensive manner, information has been compiled from a variety of sources. The numbers were generated by inventories of informal workers carried out during the execution of the IADB and World Bank projects (MAyDS); those carried out by municipalities; municipal estimates; or based on provincial diagnostic studies. In 2012, a study (Review and Update of the National Solid Waste Management Plan -MAyDS) also undertook a compilation of information on the number of informal waste pickers and is used as another source of information. It is important to highlight that compiling different sources of information implies that there was not uniform methodologies; dates for data collection; or definition of the type of informal activity or job. The majority of the data sources are studies from 2010-2014, with a few dating back earlier (for example, 2001 and 2006).

Table 34. Formal and Informal Workers in the Municipal Solid Waste Management Sector, 2001-2015, by Municipality

Province	Municipality	Inhabitants (National Census 2010)	Number of Informal Workers	Number of formal Workers	Informal Workers per 10,000 Inhabitants	Formal Workers per 10,000 Inhabitants	Ratio of Informal to Formal Workers	Source and Year of Data Collection
City of Buenos Aires		2,981,781	9,456	5,750	31.7	19.3	1.6	2015 Data from Municipal representatives
Buenos Aires	Moreno (Greater Buenos Aires)	462,242	368	—	8.0	—	—	IOM-UNICEF, 2006
	José C, Paz (Greater Buenos Aires)	263,094	522	—	19.8	—	—	Suárez, 2001 cited in the Review and updating of the National Solid Waste Management Plan Update (2012)
	Malvinas Argentinas (Greater Buenos Aires)	321,833	552	—	17.2	—	—	
	San Martín (Greater Buenos Aires)	422,830	1,100	—	26.0	—	—	Álvarez, 2010, cited in the Review and Update of the National Solid Waste Management Plan (2012)
	Mar del Plata	614,350	1,835	830	29.9	13.5	2.2	ENOSUR, 2015. Formal workers include 110 municipal employees. withsome of them working part time on solid waste management.
	Zárate Campana*	185,382	120	419	6.5	22.6	0.3	Solid Waste ManagementProject Design (2010).
	Luján*	106,899	400	242	37.4	22.6	1.7	Municipal representatives, 2012 as cited in National Solid Waste Management Plan Update

Province	Municipality	Inhabitants (National Census 2010)	Number of Informal Workers	Number of formal Workers	Informal Workers per 10,000 Inhabitants	Formal Workers per 10,000 Inhabitants	Ratio of Informal to Formal Workers	Source and Year of Data Collection
Entre Ríos	Paraná*	247,863	1.454	0	58.7	–	–	2014 data from the National Urban Solid Waste Management Project (MAyDS). Based on observations during field work in the municipalities and information provided by municipal representatives.
	Concordia	152,282	800	116	52.5	7.6	6.9	
	Gualeguaychú	97,839	95	189	9.7	19.3	0.5	2014 Data from The National Urban Solid Waste Management Project (MAyDS) Census undertaken by provincial representatives
	Gualeguay	43,009	280	35	65.1	8.1	8.0	2014 data from the Provincial Solid Waste Management Plan. Based on observations during field work in the municipalities and information provided by municipal representatives.
	Chajarí	34,848	0	75	0.00	21.5	0.0	
	Villaguay	34,637	2	107	0.58	30.9	0.02	
	Victoria	31,842	5	90	1.6	28.3	0.06	
	La Paz*	25,808	50	84	19.4	32.4	0.6	
	Nogoyá*	23,702	40	77	16.9	32.4	0.5	
	Crespo	20,203	0	53	0.0	26.2	0.0	
	Diamante	19,930	12	65	6.0	32.6	0.2	
	San José*	18,178	8	62	4.4	34.0	0.1	
	Federal	18,015	0	52	0.0	28.9	0.0	
	Santa Elena	17,883	35	6	19.6	3.4	5.8	
	Federación*	17,547	30	60	17.1	34.0	0.5	
	Rosario Del Tala	13,723	31	58	22.6	42.3	0.5	
	San Salvador	13,228	10	21	7.6	15.9	0.5	
	San José De Feliciano	12,084	25	33	20.7	27.3	0.8	
	Villa Elisa	11,117	10	7	9.0	6.3	1.4	
	Basavilbaso	9,742	20	19	20.5	19.5	1.1	
	Viale	9,641	11	55	11.4	57.1	0.2	
	San Benito	9,324	25	16	26.8	17.2	1.6	
	General Ramírez	9,222	40	30	43.4	32.5	1.3	
	Ibicuy	4,900	10	12	20.4	24.5	0.8	
	Oro Verde	4,333	0	18	0.0	41.5	0.0	
	Villa Paranacito	4,215	5	7	11.9	16.6	0.7	
	Ubajay	3,507	0	13	0.0	37.1	0.0	
	General Campos	3,149	0	15	0.0	47.6	0.0	
	Colonia Avellaneda	3,084	34	16	110.3	51.9	2.1	
	Ceibas	1,773	0	3	0.0	16.9	0.0	
	Villa del Rosario	3,973	0	18	0.0	45.3	0.0	
	Average Entre Ríos				**18.6**	**28.0**	**0.7**	
	Average Entre Ríos not considering Concordia and Paraná				**16.0**	**28.6**	**0.6**	
Santa Fe	Rosario	948.312	2,000	1,700	21.1	17.9	1.2	2015 data from Municipal Representatives (Rosario); 2012 data (Santa Fe) as cited in the National Solid Waste Management Plan Update (2012).
	City of Santa Fe	415,000	1,500	–	36.1	–	–	
	San Jerónimo*	66,702	131	151	19.6	22.6	0.9	2011 data, as cited in National Solid Waste Management Plan Update (2012)
	Humbolt	4,783	3	–	6.3	–	–	
	Firmat*	19,917	20	68	10.0	34.0	0.3	

Province	Municipality	Inhabitants (National Census 2010)	Number of Informal Workers	Number of Formal Workers	Informal Workers per 10,000 Inhabitants	Formal Workers per 10,000 Inhabitants	Ratio of Informal to Formal Workers	Source and Year of Data Collection
Tucumán	San Miguel de Tucumán	470,809	2,500	-	53.1	-	-	Municipal representatives, 2014 data from municipal representatives, as cited by the National Urban Solid Waste Management Project (MAyDS)
Salta	City of Salta (capital)	535,303	166	580	3.1	10.8	0.3	2015 data from municipal representatives
	Cafayate	3,583	20	-	55.8	-	-	
	Orán*	34,465	30	117	8.7	34.0	0.3	
	Tartagal*	79,900	35	272	4.4	34.0	0.13	
Catamarca	San Fernando del Valle de Catamarca*	109,882	66	0	6.1	-	-	2014 data from the Provincial Solid Waste Plan
	Aconquija	3,045	0	25	0.00	82.1	0.0	2014 data from the Provincial Solid Waste Plan. Based on observations during field work in the municipalities, information provided by municipal representatives and locals.
	Andalgalá*	15,087	120	51	79.5	34.0	2.3	
	Belén	13,524	8	42	5.9	31.1	0.2	
	Capayán	6,760	0	18	0.00	26.6	0.0	
	Fiambalá	7,994	0	40	0.00	50.0	0.0	
	Huillapima	9,325	0	22	0.00	23.6	0.0	
	Icaño	7,043	0	23	0.00	32.7	0.0	
	Las Juntas	412	0	23	0.00	558.3	0.0	
	Londres	2,909	0	14	0.00	48.1	0.0	
	Los Altos	7,878	8	5	10.2	6.4	1.6	
	Los Varela	1,985	0	6	0,00	30.2	0.0	
	Recreo	15,595	6	63	3.9	40.4	0.1	
	San José	5,518	3	6	5.4	10.9	0.5	
	Santa María	17,030	7	69	4.1	40.5	0.1	
	Saujil	5,572	0	15	0.00	26.9	0.0	
	Tinogasta	14,366	0	24	0.00	16.7	0.0	
	Valle Viejo	27,242	2	74	0.73	27.2	0.03	
	Average Catamarca				**6.5**	**63.8**	**0.1**	
	Average municipalities outside the 31 main urban agglomerations (EPH)				**13.3**	**39.2**	**0.3**	
	Average all evaluated municipalities				**15.7**	**37.0**	**0.4**	
Chaco	Resistencia	386,000	300	—	7.8	—	—	2011 data from the Provincial Undersecretary of the Environment, as cited in the National Solid Waste Management Plan Update (2012).
Misiones	Posadas	323,739	1,570	—	48.5	—	—	IOM-UNICEF, 2006.

Province	Municipality	Inhabitants (National Census 2010)	Number of Informal Workers	Number of Formal Workers	Informal Workers per 10,000 Inhabitants	Formal Workers per 10,000 Inhabitants	Ratio of Informal to Formal Workers	Source and Year of Data Collection
Mendoza	Mendoza Metropolitan Area	1,086,066	750	—	6.9	—	—	2010 data, as cited in National Solid Waste Management Plan Update (2012).
	Rivadavia (East Zone of Mendoza)	31,038	57	106	18.4	34.0	0.5	2014 data from the National Urban Solid Waste Management Project (MAyDS). Census undertaken by provincial representatives.
	San Martin (East Zone of Mendoza)	79,662	82	180	10.3	22.6	0.5	
Chubut	Trelew	99,430	22	0	2.2	—	—	2012 data from the National Urban Solid Waste Management Project (MAyDS). Census undertaken by provincial representatives.
	Rawson	31,787	17	0	5.4	—	—	
	Comodoro Rivadavia	173,266	116	392	6.7	22.6	0.3	2011 data, as cited in National Solid Waste Management Plan Update (2012).
	Puerto Madryn	81,995	27	185	3.3	22.6	0.2	2012 data from the National Urban Solid Waste Management Project (MAyDS). Census undertaken by provincial representatives.

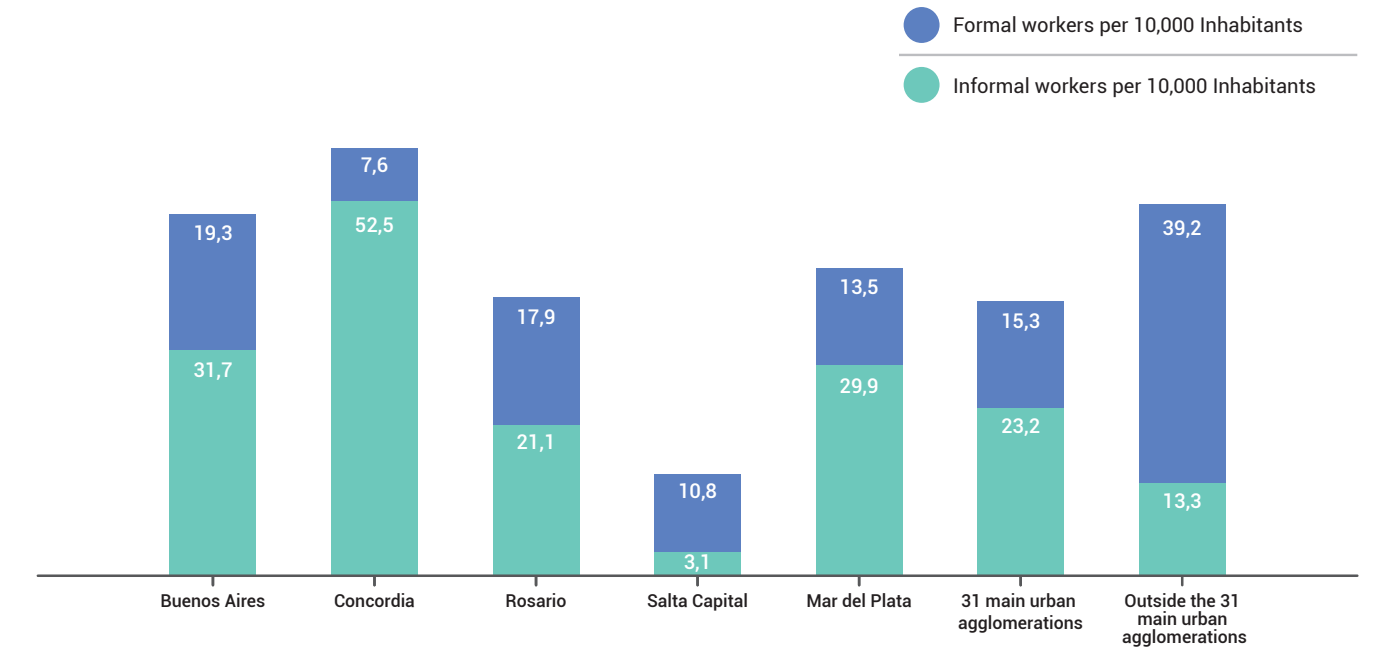
Source: Own elaboration based on sector, project, municipal and provincial studies and plans, 2001-2015.
For the municipalities with more than 15,000 inhabitants and less than 300,000 and no specific data on formal workers, the averages found with the National Urban Solid Waste Management Project (MAyDS) database were used.Waste pickers are, in general, informal workers.
However, this category includes both informal workers and those have been formalized, for example hired by the municipality and/or are part of a cooperative.

Table 35. Formal and Informal Workers in the Solid Waste Management Sector, 2001-2015, in Selected Municipalities, all Municipalities and within the 31 Main Urban Agglomerations

Municipality	Informal Workers per 10,000 Inhabitants	Formal Workers per 10,000 Inhabitants	Ratio of Informal to Formal workers
City of Buenos Aires	31.7	19.3	1.6
Mar del Plata	29.9	13.5	2.2
Concordia	52.5	7.6	6.9
Rosario	21.1	17.9	1.2
Salta	3.1	10.8	0.3
Average for the 31 main urban agglomerations	**23.2**	**15.3**	**1.5**
Average Entre Ríos	18.6	28.0	0.7
Average Catamarca	6.5	63.8	0.1
Average other municipalities	13.3	39.2	0.3
Average all municipalities	**15.7**	**37.0**	**0.4**

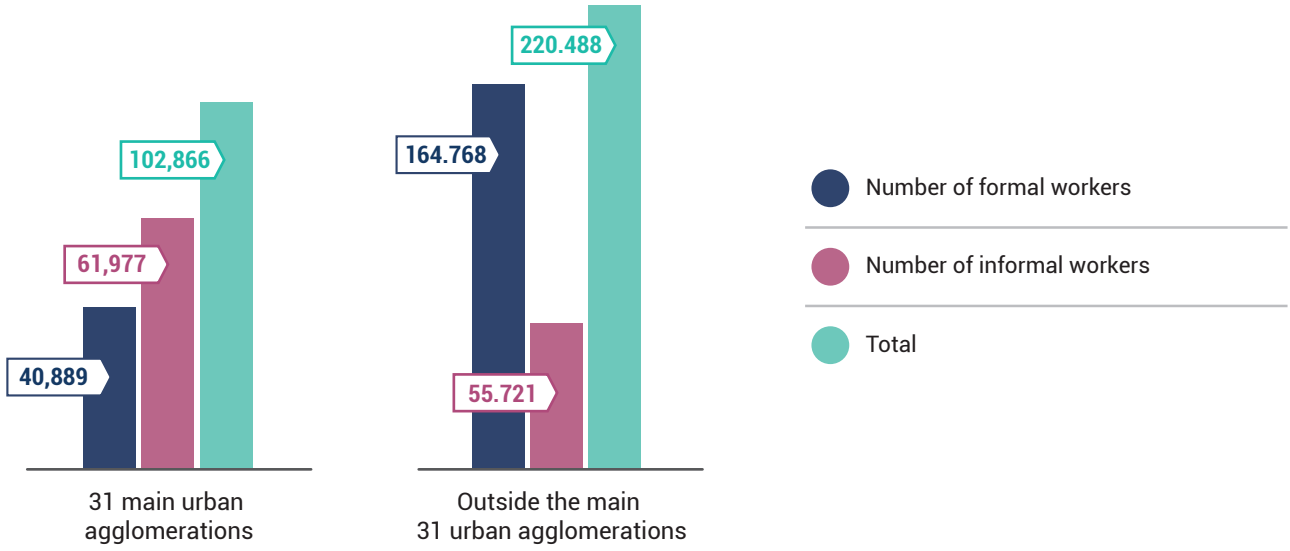
Source: Own elaboration based on sector, project, municipal and provincial studies and plans, 2001-2015.

Figure 22.
Formal and Informal Workers in the Solid Waste Management Sector per 10,000 Inhabitants for Selected Cities, 2001-2015



Source: Own elaboration based on sector, project, municipal and provincial studies and plans, 2001-2015.

Figure 23.
Estimated Total Number of Formal and Informal Workers in the Solid Waste Management Sector in the 31 Main Urban Agglomerations, 2001-2015



Source: Own elaboration based on sector, project, municipal and provincial studies and plans, 2001-2015.

Data analysis

- On average, the number of informal workers in the solid waste sector per 10,000 inhabitants is 23.2 for the 31 main urban agglomerations which is similar than that found by EVAL (2010).

- There is significant variability among provinces, for example, Catamarca has a much lower number of informal workers in the solid waste sector per 10,000 inhabitants than Entre Ríos.

- There is a proportionally higher amount of informal workers than formal workers in the 31 main urban agglomerations, where 60 percent of the workers are informal. Outside of the 31 main urban agglomerations 25 percent of the workers are informal.

- An estimated 323,354 people work in the solid waste sector, 117,698 of them being informal and 205,657 being formal.

9. *Costs of solid waste management services*

9. Costs of solid waste management services

The surveyed municipalities spend, on average, USD 118.2 per ton on all solid waste services.

The surveyed municipalities spend, on average, 13 percent of their budget on solid waste services.

Collection and street sweeping account for, on average, 60 percent of the total costs of solid waste services in the surveyed municipalities.

Tariffs cover less than 30 percent of the costs of solid waste services and tariff collection rates are on average 50 percent.

9.1 National Urban Solid Waste Management Project (MAyDS) Matrix of costs

The National Urban Solid Waste Management Project (MAyDS) developed an Excel tool for municipalities to calculate the costs of the different phases of solid waste management systems. Between 2012 and 2014 a series of three day long workshops in 14 Argentine provinces was undertaken to provide training on the tool and collect information. At the end of the workshop, the municipal representatives were able to estimate their solid waste management costs.

It should be noted that most municipalities do not know accurately how much they spend on solid waste management services and many municipal representatives were calculating their solid waste mangement costs for the first time. In addition, the costs presented do not control for the quality of service, so while they represent expenditures on solid waste collection, the costs do not represent the relative efficiency of different municipalities in delivering a waste collection service of a given quality.

Table 36. Waste Collection Cost, 2012-2014, by Municipality Size

Size of Municipality (inhabitants)	Average Collection Cost per Collected ton (US$ per ton)
Less than 9,999	61.7
10,000–49,999	39.4
50,000–99,999	41.1
100,000–199,999	79.6
200,000–499,999	51.6
500,000–999,999	58.9
More than 1,000,000	42.1

Source: Workshops carried out by the National Urban Solid Waste Management Project (MAyDS) between March 2012 and October 2014 based on annual information provided by municipalities. The Exchange rate used was the date of the individual workshops.

Table 37. Waste Disposal Cost, 2012-2014, by Municipality Size

Municipality Size (inhabitants)	Disposal Cost per Disposed Ton (US$ per ton)	Total Cost of all Solid Waste Services per Ton (US$ per ton)	Disposal cost as a % of Cost of all Solid Waste Services
Less than 9,999	14.8	136.0	10.9
10,000–49,999	8.8	107.2	8.2
100,000–199,999	7.4	128.4	5.8
200,000–499,999	8.0	118.5	6.8
50,000–99,999	15.1	86.9	17.4
500,000–999,999	14.9	133.3	11.2
More than 1,000,000	13.7	128.1	10.7
Average per municipality	**10.9**	**118.2**	**9.2**
Average per municipality with sanitary landfill	**20.3**	**136.3**	**14.9**

Source: Own elaboration based on information developed in matrix cost workshops carried out by the National Urban Solid Waste Management Project (MAyDS) between March 2012 and October 2014. The currency exchange rate corresponds to the official rate on the day of the workshop.

Table 38. Economic and Financial Indicators, 2012-2014

Indicator	Average (%)
Costs of all solid waste services (% municipal expenditures)	**13**
Cost recovery	
Income from solid waste tariffs (% of total municipal income)	20
Income from solid waste tariffs (% of total solid waste costs)	30
Collection rates of fees from households (% of fees that are collected)	49
Contribution of costs by service (% of total costs of all solid waste services)	
Collection	34
Street sweeping	26
Final disposal	12
All of the above mentioned items	71

Source: Own elaboration based on information developed in matrix cost workshops carried out by the National Urban Solid Waste Management Project (MAyDS) between March 2012 and October 2014. The presented income does not necessarily originate from a specific solid waste tariff but from a fee or tariff that is used to cover the costs of solid waste management.

Data analysis

- The surveyed municipalities spend significantly more budget on waste collection and street sweeping services than on waste disposal service. 60 percent of the costs of solid waste management can be attributed to waste collection and sweeping services.

- The surveyed municipalities with sanitary landfills have waste disposal service costs that are nearly twice as high as the overall average.

- Table 21 shows that in the surveyed municipalities solid waste expenditures, on average, account for 13 percent of total municipal spending.

- The surveyed municipalities are not able to fully recover their costs through tariffs. Tariffs cover less than 30 percent of costs and the average tariff collection rates is less than 50 percent.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