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Territorial inequalities expressed in children's health in two neighborhoods with access to water in the city of El Alto

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Abstract
Official figures on the access to water show almost total coverage in Bolivia's cities and a lower coverage of basic sanitation, which suggests an improvement in the quality of life of the population. An analysis of the socio-economic situation of the inhabitants of two neighborhoods of El Alto shows disadvantaged housing and neighborhood conditions correlated with the presence of infections in children under 5 years of age, a fact also seen in a population suffering from inequality in educational, occupational and ethnic terms. Official figures do not report either on the quality of the water service or its intermittency in this area. Focusing attention on a territory and the use of qualitative tools (interviews) help nuance the universalizing figures of state administrative successes.

Keywords
Inequality, child health, water, territory, El Alto

Classification JEL
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Résumé
Les chiffres officiels sur l'accès à l'eau montrent une couverture presque totale dans les villes de Bolivie et une couverture plus faible de l'assainissement de base, ce qui suggère une amélioration de la qualité de vie de la population. Une analyse de la situation socio-économique des habitants de deux quartiers de El Alto montre que les conditions de logement et de voisinage défavorisées sont corrélées à la présence d'infections chez les enfants de moins de 5 ans, un fait également constaté dans une population souffrant d'inégalités en termes d'éducation, de profession et d'ethnie. Les chiffres officiels ne rendent compte ni de la qualité du service de l'eau ni de son intermittence dans ce domaine. La focalisation de l'attention sur un territoire et l'utilisation d'outils qualitatifs (entretiens) permettent de nuancer les chiffres universalisants des succès administratifs de l'État

Mot-clés
Inégalités, santé infantile, eau, territoire, El Alto

Introduction

The occupation of space with a view to forming an urban concentrate began in the 1940s in El Alto. As a result of these settlements, the city developed, historically "according to economic, social, political and geomorphological conditions" (GAMEA, 2017: 20). Currently "the municipality displays difficulties because of the accelerated expansion of its urban sprawl, with serious problems in the provision of services and infrastructure, without any planning consistent with its urban and rural reality, in the absence of interinstitutional coordination" (p. 47).

The social struggles of the inhabitants faced with the living conditions of discrimination and exclusion led to consider El Alto as a space with a homogeneous population in its socio-economic situation and political exercise (Arbona, 2008). The protests in October 2003, with tough military repression against the people mobilized in the streets, consolidated this perception of a municipality concentrating disadvantageous conditions for all its inhabitants.

Data from the 2001 Census justified this characterization of the municipality of El Alto as a whole, together with the neighborhood of Cotahuma in La Paz and the southern area of Cochabamba, because they displayed "the most alarming levels of lack of basic services: acute deficiencies of the piped drinking water network providing water in the houses, a deficient consumption and distressing levels of deterioration in the quality of life", with women as the most disadvantaged population sector (Ledo, 2005: 245)[1].

The need for urban planning and attention to the problems of development lead to new perspectives of the municipality of El Alto as an object of study. Thus, studies of socio-economic aspects emerge that reveal territorial inequalities at the beginning of the 21st century. Durán, Arias and Rodríguez (2007) verify the quality conditions of housing, based on the 2001 Census, with marked differences between districts. While about half of the population lived in average housing, the Housing Adequacy Index is high in district 1 and very low in districts 7 and 8, even lower than in rural areas. The authors have not only observed the existence of socio-economic inequalities within the municipality, but they also show that, by choosing one element to enhance their quality of life, the inhabitants may simultaneously be forced to give up another, the main example being the investment in housing to the detriment of education (Duran *et al*., 2007: 85).

Poupeau (2010a), on the other hand, describes intra-urban mobility in El Alto with its external rings inhabited not by recent rural migrants but by people who, due to their economic condition, can only settle in that area. This space away from La Ceja, the center, also has a population of owners, organized to access services and with a population of women in the role of "housewives" due to the age of the children. The study conducted by Garfias and Mazurek (2005) identified the three rings for three social strata and found that population density is associated with urban consolidation, equipment of the dwelling and access to basic services, a low illiteracy rate and employment with a focus on commerce and services.

[1] The same author stated that, with regard to the provision of piped drinking water, districts 4, 5 and 6 of El Alto had an "excellent supply" (Ledo, 2005: 138).

Studies on El Alto also show other aspects in which inequality begins to take center stage, as in the case of literacy among older women. Roosta (2017: 29) shows that the number of literate men almost doubles that of women, especially from the age of 80, which "points to the cumulative effects of discrimination against women in access to the formal education system". For school education, a similar situation is reflected: "from the age of 70, men report almost twice the rate of women in terms of primary, secondary and higher education".

The study of social dynamics in El Alto, therefore, requires the recognition of the heterogeneity of its socio-economic traits and political expressions, and the "evolution" towards the socio-spatial segregation typical of Latin American cities.

1. Drinking water, sanitation and its relationship to child health

Access to drinking water is a target largely met by the Bolivian government within the 2015 Millennium Development Goals, an achievement consistent with the constitutional enshrinement (2009) of the human right to water. However, statistics show that coverage is not yet massively reaching rural areas and that basic sanitation is pending (UDAPE, 2015).

In the case of sewerage, the government admits "a structural lag" due to "the fact that a real demand of the population for this service, mainly rural, has not yet been identified, especially when it does not link access to sanitation with significant improvements in health" (MMAyA, 2017: 121).

In these terms, access to water and sanitation is currently sixth among the Sustainable Development Goals (SDGs) by 2030, because sewerage coverage reaches only 50% of the population and wastewater is disposed of in water bodies.[2]

The fact is that improvements in health thanks to accessing treated water and basic sanitation are evident. The incidence of Acute Diarrheal Diseases (ADDs) and Acute Respiratory Infections (ARIs) in childhood has decreased in recent years (table 1). Both diseases have causes or factors of socio-environmental origin such as "access to safe water, hygiene and basic sanitation, environmental conditions, feeding practices and nutritional status, access to specific vaccines, pollution, among others" (INE, 2017: 56).

Table 1. Bolivia: Children under 5 years old with ADDs and ARIs* (in %)
Source: EDSA 2016
* Data from two weeks prior to the consultation of mothers, carried out on 03/05-30/09, 2016.

Data source	ADDs	ARIs
EDSA 2016	14.1	12.1
ENDSA 2008	26	20

Access to safe drinking water and sanitation is regarded as a human right by international organizations, without emphasizing or giving priority to any of these services. This article considers the importance of both elements (water and sanitation) in the quality of life of the people covered by the study; its objective is, therefore, to analyze the territorial inequality expressed in the social determinants of health and the prevalence of diseases in children under 5 years old, in two neighborhoods of the city in El Alto that have a different supply of drinking water and sanitation services.[3]

[2] Access to water and sanitation is SDG 6. For more information: https://www.sdsnbolivia.org/agua-limpia-y-saneamiento/

[3] UN Assembly Resolution 64/292 of July 2010 recognizes the right of access to safe drinking water and sanitation together. Documents on population, housing and human settlements of these agencies consider water and sanitation as an indivisible right, and there are unofficial positions to have sanitation as an independent right. For more information see: OHCHR (n.d.). The right to water. Fact Sheet No. 35.

The most recent census conducted in the country in 2012 revealed a coverage of 95.8% of private homes with access to water in urban areas and 2.6% in rural areas. As far as basic sanitation is concerned, only 63.57% of the population is covered.[4] Housing, employment and access to basic services are generally precarious.

The epidemiological profile of El Alto assigns the first and second place, respectively, to acute infections of the upper respiratory tract (9.7%) and diarrhea and gastroenteritis of suspected infectious origin (5.9%) for population segments of all ages. This table is complemented by the data that diarrhea and gastroenteritis accounted for 20,642 cases in 2014, more than half of them (10,906) in children aged 1 to 4 years (GAMEA, 2017).

Spatial differences are also expressed in the area of health and precisely in the manifestation of the ADDs that are of interest to this study. A more localized look shows us the need to analyze the living conditions of the population of the municipality of El Alto that goes to the 'Lotes y Servicios' Health Network that reports a greater amount of ADDs compared to the other networks (357.3 cases per 1,000). Table 2 shows the wide difference in the incidence rate of ADDs in children under 5 years of age in this network of health services.

Table 2. El Alto: ADDs in <5 years old (cases x 1,000) (January-October 2017)
Source: SEDES La Paz, 2017

Health Network	Number of cases
Red de Salud Boliviano Holandés	233.7
Red de Salud Corea	292.5
Red de Salud Senkata	271.7
Red de Salud Los Andes	203.9
Red de Salud Lotes y Servicios	357.3

The high rate of ADDs in children under 5 years of age reported in the 'Lotes y Servicios' Health Network, located in an urban context and with a massive supply of drinking water, underscored the need for investigating the social determinants of the health of its population. In order to analyze the 'Lotes y Servicios' Health Network,[5] the population covered by two medical offices of the 'Mi Salud' Program,[6] located in that territory, was taken into account, since these offices record data on the socio-economic and environmental conditions of the

[4] "It is necessary to keep in mind the difference between coverage with drinking water and sanitary sewerage networks and coverage with drinking water and sanitary sewerage services. Even if a housing development has a water mains networks, the scenario is different if an operator (EPSAS) is providing water. The situation is more complicated in terms of sanitation because in the sector there may be sanitary sewerage collectors, but if they do not have discharge points, the collection from the areas served is not guaranteed" (Tenorio, G., personal communication, 10 September 2019).

[5] The 'Lotes y Servicios' Health Network is an administrative division of the Ministry of Health in that municipality and covers parts of municipal districts 4, 7, 9, 11 and 14. Its management depends on the Departmental Health Service (SEDES), which is a unit of the Autonomous Departmental Government of La Paz. In territorial terms, the 'Lotes y Servicios' Health Network covers both a fully urbanized area, which reaches the neighborhoods of Villa Tunari and Río Seco adjacent to the Juan Pablo II avenue, and two recent housing developments, i.e. San Roque (road to Copacabana) and the area along the road to Laja.

[6] The 'Mi Salud' health program is the result of a policy of the Ministry of Health and entirely administered by the latter. In the city of El Alto, it has been operating since 2013 in agreement with this municipal administration as the result of political agreements with the then mayor Édgar Patana of the Movement towards Socialism, i.e. the party of President Evo Morales Ayma.

inhabitants of its area of influence. The data collected in the so-called family folders[7] of the medical offices of Agua de la Vida, located in the nucleus of Río Seco (district 4), and Nuevo Amanecer, located on the road to San Roque (district 7), were systematized in order to examine the socio-economic situation of the population and the quality of material life of each place. The access to drinking water and the sanitary conditions were analyzed specifically because they theoretically impact the incidence of ADDs in the population in general and in children under 5 years of age in particular.

For the comparative analysis of both medical offices, the following data were used as the basis:

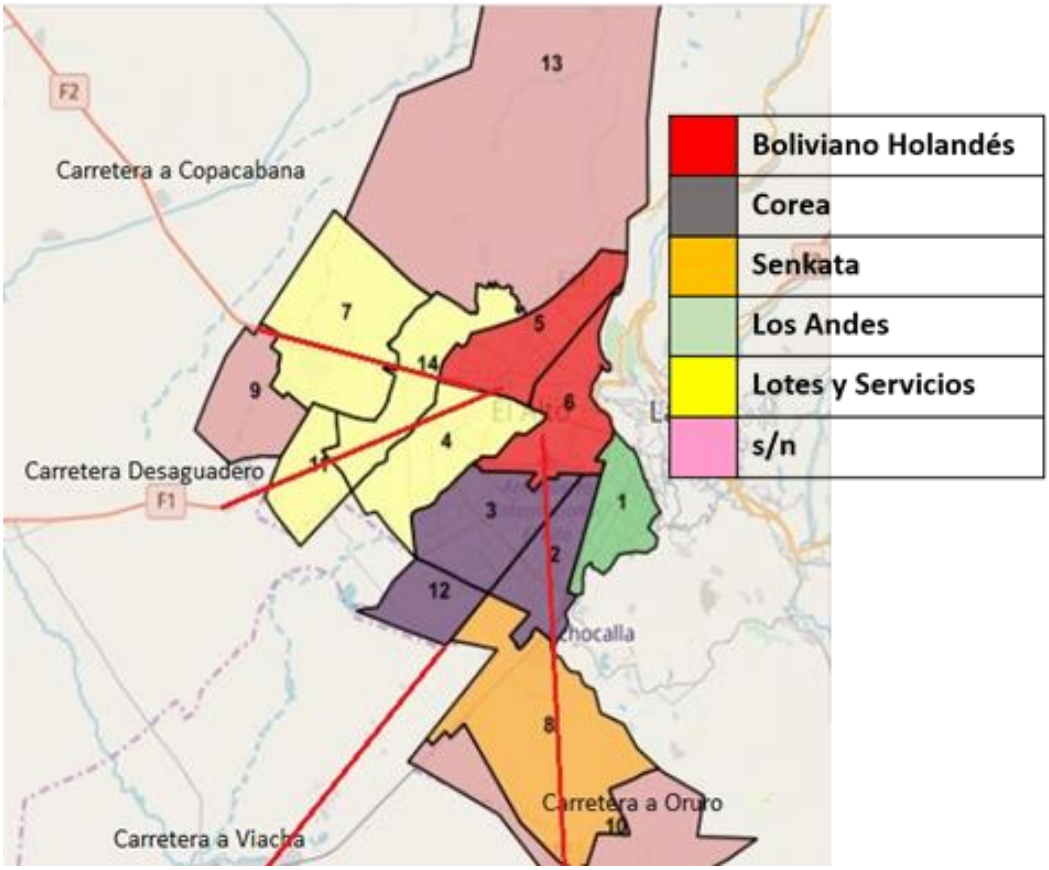
Table 3. Medical offices of the 'Mi Salud' Program considered in the study (as of October 2018)
Source: 'Mi Salud' Program, El Alto, 2018.

Description	Medical office Agua de la Vida	Medical office Nuevo Amanecer
Families with folders	366	488
Individuals with folders	1,648	2,052
Children aged 0 to 4	130	229
ADDs in <5 years	27	67

The systematization of the social determinants of health was supplemented and contrasted with qualitative information obtained in semi-structured interviews conducted with political and operational officers of the 'Mi Salud' Program under the Ministry of Health, the Municipal Health Directorate of El Alto, neighborhood leaders and mothers who go to the 'Mi Salud' medical offices. The interviews were conducted during several visits to the study areas, and after the analysis of the quantitative data the interviews were concentrated in the neighborhood of Nuevo Amanecer to identify the particular features of the population and its actors.

[7] The 'Mi Salud' Program uses this internally compiled information for its projections as it is more accurate than the information from the 2012 Census. As soon as a medical office is opened in the neighborhood, the medical staff has one year to collect the socio-economic data of the population living in the neighborhood, using the family folder instrument. This information is updated on a yearly basis.

Map 1. El Alto: Health Networks
Source: www.geobolivia.com



Map 2: Areas of influence of the medical offices in the Agua de la Vida and Nuevo Amanecer neighborhoods
Source: own elaboration in Google Mymaps based on sketches from the 'Mi Salud' Program, El Alto.

2. Social determinants of health, inequality and territory

Once located in the medical offices of Agua de la Vida and Nuevo Amanecer, the data collected in the family folders were systematized to identify the factors suggested by the WHO Commission on Social Determinants of Health (CSDH).[8] It is not a determination as a direct cause-effect relationship, but rather a correlation between complementary elements of the same structure.

Empirically based on life expectations and the incidence of diseases in European populations, which differ in terms of employment and income, Whitehead (1991) asserts that health vulnerability is not only based on the biological condition of individuals or their personal behaviors (smoking, drinking alcohol, etc.), but for example on aspects of their income level, such as material housing conditions or food selection. In this sense, socio-economic and environmental factors, including lifestyles, and to a lesser extent individual biological conditions, are part of the causes underlying health inequities.

While some social determinants of health may be unlinked to human health, in reality political and institutional factors, for example, also influence people's well-being as they impact their daily lives. For Peter and Evans (2002: 33), occupying a position on lower steps within the social division of labor "places certain groups of people at a disadvantage, not only economically, socially and politically, but also in terms of their health prospects". Another way to put it is that "the final physiological pathways leading to individual ill-health are inextricably linked to social conditions" of life (Diderichsen et al., 2002: 15). Therefore, the idea is to balance both socio-economic and biological aspects within studies or analyses.

This approach to human health is related to the idea of development, individual freedoms and agency capacity of the population (Solar and Irwin, 2010: 13). It is about the human being having the fundamental freedoms (or abilities) "to choose the life we have reason to value" (Sen, 2000) and to be an agent capable of influencing the decisions of the centers of power. The capacity of actor carries a political burden that calls for the exercise of power in society. The relationship between the agency capacity of the organized population and the State responsible for guaranteeing rights is at the heart of the action of the social determinants of health.

The CSDH has received criticism from Latin America, mainly regarding the pragmatic nature of its derivation in public policies as a predictable solution, derived from the analysis of the superficial elements of a social context (Morales-Borreo et al., 2013). Jaime Breilh (2010a) notes that capitalism's need to provide labor is the fundamental idea of the analysis of the social determinants of health because it does not consider relationships of exploitation within the sphere of production in the analysis. Polo Almeida (2016) questions that international organizations point to proposals for "development" (the quotation marks are his) under a notion of the people's duty to be with respect to their quality of life, a task that often falls specifically on women, with the consequent imposition of roles.

[8] The definition of social determinants of health emerged at the International Conference on Primary Health Care, in 1978, whose Declaration of Alma-Ata recognizes the inequality in the health status of the population and promotes the approach of the population to the health system and its political participation in relevant decision-making in this regard.

The CSDH proposes to analyze the structural determinants (occupation, income, sex, ethnicity and state policies), while verifying how these elements relate to the intermediate determinants that impact people's quality of life (material conditions, behaviors and psychological factors).

The existence of unequal social relations has guided the CSDH. And inequality is a concept that can take on different nuances that are not mutually exclusive, for example the old concept of poverty. Bayón (2005) refers to poverty, more precisely urban poverty, when he describes the social group with the greatest disadvantages as the recipient of a series of policies or actions for their benefit, supposedly oriented towards their inclusion. Poverty is also the predominant concept in a series of studies on the health of the urban population in Asunción (Rodero and Merino, 2018) that analyzes the link between the composition of the territory, survival strategies and the forms of production and governance of poverty.

Access to resources that circulate as a result of social production is a measure of poverty, but it goes beyond this. Non-material resources (cultural, educational, power) that people incorporate or use in their relationships are also counted. Poverty would be the expression of a - poor, unfair, inequitable - distribution of all available resources.

For Reygadas (2008), inequality cannot be analyzed except in the context of the appropriation and expropriation of those material and immaterial resources available in society, a process that he considers to be predominantly controlled by the exercise of power in its broad sense. Power relations then become "the relationships that are established between the social agents through the differentiated control of various significant resources" (p. 39). Inequality, therefore, is not only a socially constructed process mediated by power relations, but it is also the result of and comprises a historical accumulation (Reygadas, 2008; Tilly, 2000) that deserves to be part of research.

Based on the work of predecessors, Sequera (2018: 260-261), referring to the main features of inequalities in health, says that these are historical, rooted in the past; that they have a huge impact, beyond what is perceptible; that they are gradual across the social scale; growing over time; and adaptive even to health policies. Focusing on these inequalities within defined spaces of the city of El Alto points to the need for spatial sociological analysis.

3. Characterization of the population in Agua de la Vida and Nuevo Amanecer

El Alto is a municipality whose urbanization is growing at the pace of the organization imposed by the migration of recent years, mainly from rural areas, with an economic activity supported by self-employment (commerce and services) and with demands from social organizations focused on citizen security (GADLP-UMSA, 2015).

Direct observation shows an old settlement in Agua de la Vida (neighborhood located in the center of Río Seco) with commercial areas, productive activity and considerable movement of people around public spaces (schools, health centers, market, sports fields, social offices of organized groups). The neighborhood is close to the blue cable car station and the former Río Seco checkpoint where different transport lines converge, offering transportation to Copacabana and Laja, as well as to important neighborhoods such as Villa Ingenio and San Roque. If we think in terms of consolidated urbanization, Agua de la Vida already had these characteristics some 20 years ago, as mentioned by Garfias and Mazurek (2005) based on the 2001 Census.

Three blocks from the Agua de la Vida medical office is the 'Lotes y Servicios' Health Center, the administrative office of the 'Lotes y Servicios' Network, in the center of Río Seco. There, local health leaders converge in weekly meetings to receive information, manage, coordinate, demand and exercise their political mandate with full openness of the medical staff and premises.

In contrast, in Nuevo Amanecer, there are mainly unpaved streets and no sidewalks, vacant plots of land, little movement of people on their roads and little commercial and/or productive activity, although there is visible movement of people around the schools. The main avenue/highway to Copacabana is the only way of circulation of passenger transport for the local residents, who do not have this service within the neighborhood, which also lacks internal circulation of private vehicles. The local medical office in this neighborhood is located within the premises of the neighborhood council and is open to the public only when the medical officer or nurse is present. The weekly fair of the neighborhood gives some dynamism to the area. A disused public tap shows that this was the water supply mechanism until recently. Neighborhood leaders describe the living conditions as being unchanged in the last twenty years.

3.1. Inequalities of origin in two neighborhoods (education, gender, ethnicity)

Occupation, education, gender and ethnicity are aspects that define the location of people within the social hierarchy, and are therefore considered as structural determinants of health. There may be other factors, but if an individual has a disadvantage in more than one of these elements, he or she will be more susceptible to discrimination or exclusion processes in society.

The occupation of each family member is recorded in the family folders (table 4). In Nuevo Amanecer, the occupation of women in housework involves their exclusive dedication to the care of their children, the sick and the elderly. Another feature that stands out is the presence of professional and intellectual neighbors in Agua de la Vida, a fact that, together with the category “office or related employees”, points to a sector that participates in the (state or

private) bureaucracy and constitutes a medium sector with purchasing power. The "unspecified or other" option, mainly in Nuevo Amanecer, is also highlighted in the absolute numbers to reflect possible occupations for survival. The dedication to services, vending and related activities is consistent with the self-employment that prevails in the city of El Alto, with great weight in Agua de la Vida.

People over 14 years of age from both neighborhoods declare school as their central activity, i.e. a mainly young population in the process of education. This is the only point of similarity between the two sectors.

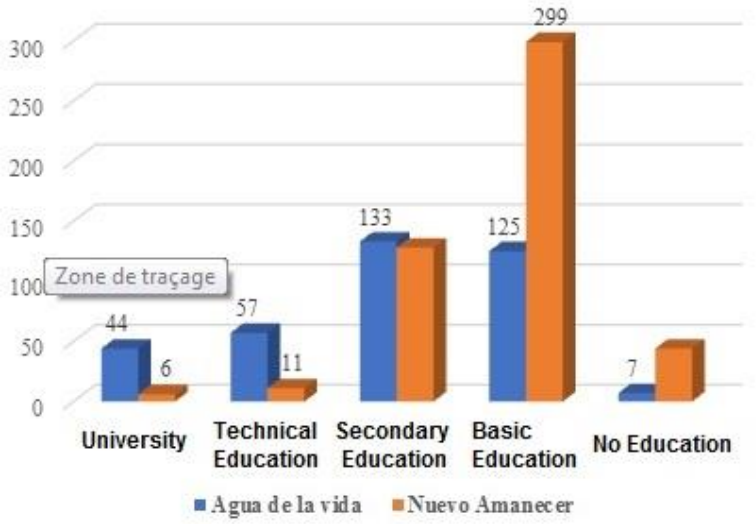
Table 4. Medical offices in Agua de la Vida and Nuevo Amanecer: occupation of the population, broken down (January to October 2018)
Source: 'Mi Salud' Program, El Alto, 2018.

Occupation	Agua de la Vida 14 years or more	Nuevo Amanecer 14 years or more
Government and company officers	0	0
Scientific and intellectual professionals	**119**	**2**
Medium-level technicians and professionals	71	53
Office and related employees	56	1
Work in the services sector, vending and related sectors	377	212
Agricultural, forestry and related work	1	21
Artisans and craftsmen	52	61
Machine and plant operators	0	14
Day laborers and unskilled workers	**1**	**84**
Armed Forces	3	4
Unspecified or other	29	263
Student	389	366
Housework	**152**	**259**
Retired or 'dignidad' state retirement pension	38	18
Unemployed	5	1
TOTAL	1,293	1,359

Education is the second factor of analysis. To this end, the family folders collect data on the level of schooling of mothers. If in-school education is considered to be a step towards paid occupations and/or incomes above the minimum wage, especially women in Nuevo Amanecer are at a serious disadvantage and suffer inequality in relation to their male peers in obtaining salaried and fixed employment that can eventually guarantee them a retirement pension.

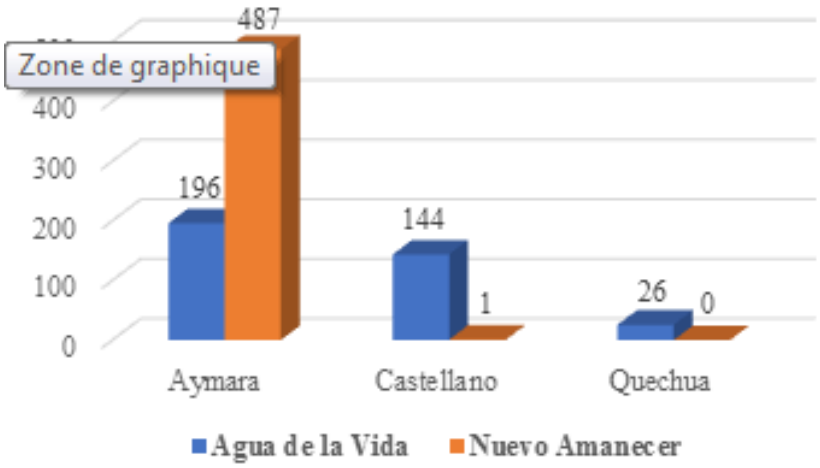
Graph 1 shows a special feature in Nuevo Amanecer: more than 70% of the mothers are women with basic education and with no education; at the other end, women with a university and technical education account for 3%. In Agua de la Vida, on the other hand, the mothers with higher education account for an expectant 28%.

Graph 1. Medical offices in Agua de la Vida and Nuevo Amanecer: level of schooling of mothers (January to October 2018)
Source: 'Mi Salud' Program, El Alto.



After analyzing the occupation of the population and the level of education of mothers, one element that accounts for the ethnic origin of the people is the language, in this case the question is addressed to the heads of the household. Although ethnical origin may be important for the transit of different habits or lifestyles from the countryside to the city and vice versa, this factor is fundamentally important because it expresses how the arrival of basic services and human rights to people with ethnic descent is incidentally more restricted, as will be mentioned below. Solar and Irwin (2010) report that discriminated or oppressed ethnic groups often suffer compound forms of discrimination. For our case, although bilingualism is widespread in the spoken language, only the heads of the family of Nuevo Amanecer (graph 2) report Aymara as the language in which they learned to speak.

Graph 2. Medical offices in Agua de la Vida and Nuevo Amanecer: mother tongue (January to October 2018)
Source: 'Mi Salud' Program, El Alto, 2018.



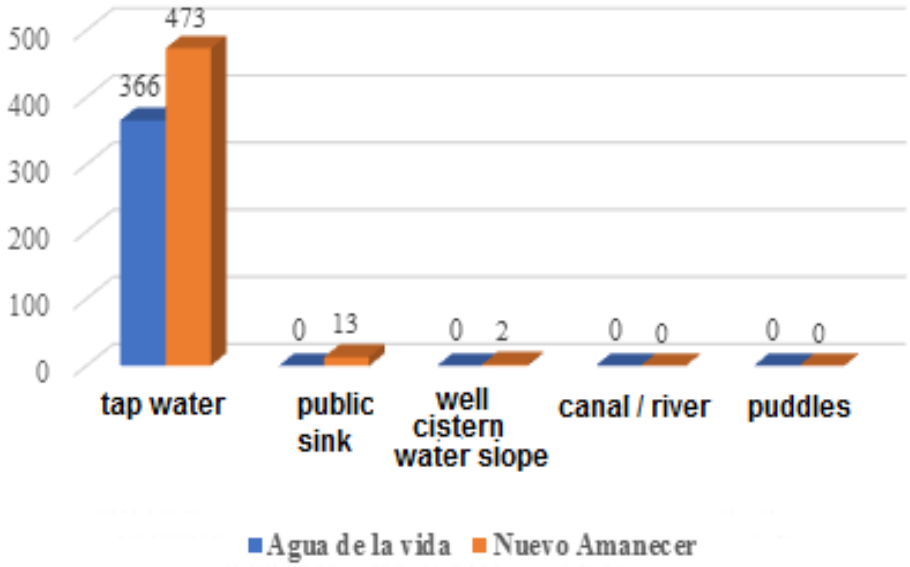
3.2. Inequalities in material conditions in two neighborhoods

A notable difference in the quality of life of both areas is the type of housing. In Agua de la Vida, 75% of the families have single-family dwellings and 17% live in an apartment, which means having a separate kitchen area and toilet inside the home, and 8% in single rooms. In Nuevo Amanecer, on the other hand, 99% of the families live in single rooms and 1% have a room not intended for living. The families living in single rooms are in a situation of over-crowding, which is a factor conducive to the spread of diseases.

In Nuevo Amanecer, there is a greater number of owners, although in Agua de la Vida the cases of people having an antichresis contract and living in rented houses also reveal the purchasing power of people. In Agua de la Vida, 64% are owners, 13% pay rent and 8% have an antichresis contract, 3% are paid caretakers and 12% have another modality (a house lent to them, usually from parents to children). In Nuevo Amanecer, the people who declare they are owners account for 82%, rent 8% and antichresis 1%, 6% are paid caretakers and 3% have another arrangement. The option of rent or antichresis in Agua de la Vida reveals the ability of a part of the population to allocate large amounts of money per month to spending on housing, which is consistent with the presence of professionals, intellectuals and employees and workers in services and commerce.

Regarding the factors directly linked to access to water and basic sanitation, access to piped drinking water is the majority system in both neighborhoods (graph 3), but although the supply of drinking water is almost total, it is nuanced by problems in the quality of the liquid. Interviews with mothers and doctors reflect the fact that water does not reach the entire population of Nuevo Amanecer with the same quality and frequency. At the same time, it is seen that this has not been a problem for its inhabitants so far, in the sense of water quality becoming the target of a demand.

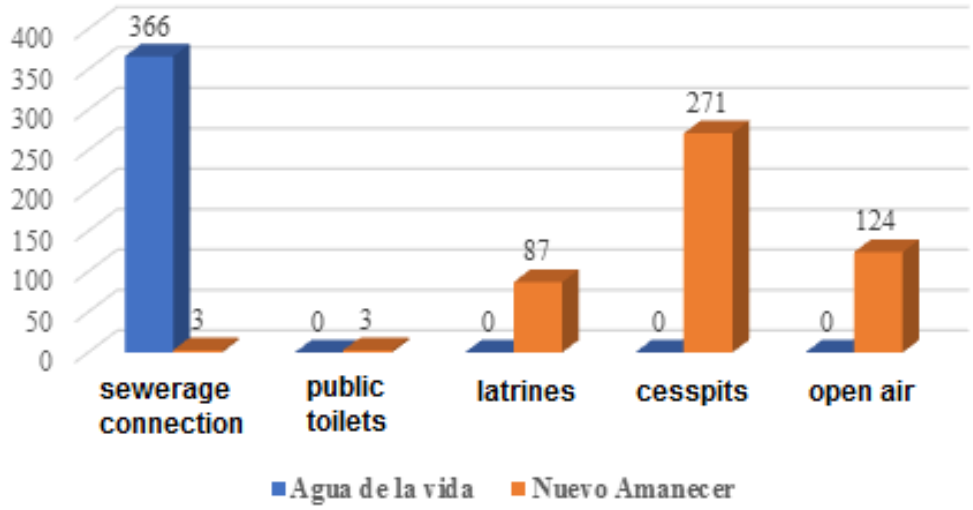
Graph 3. Agua de la Vida and Nuevo Amanecer: water supply (January to October 2018)
Source: 'Mi Salud' Program, El Alto, 2018.



The excreta disposal indicator is one of the fundamental differences between the two spaces (graph 4). While Agua de la Vida has a sewerage connection for the total population, in Nuevo Amanecer there are cesspits, latrines and defecation in the open air (mainly in vacant plots of land), in a setting in which the streets have no pavement and in the rainy season there are mud puddles and the roads flood.[9] On the other hand, there are also small herds of sheep and pigs belonging to the local residents that are taken to "graze" precisely on the vacant plots that are not completely enclosed.

Defecation in the open air is a fact identified as a problem by local leaders, mothers and medical personnel; however, this level of awareness does not give rise to any urgent demand due to its impact on the health of the inhabitants.

Graph 4. Agua de la Vida and Nuevo Amanecer: excreta disposal (January to October 2018)
Source: 'Mi Salud' Program, El Alto, 2018.

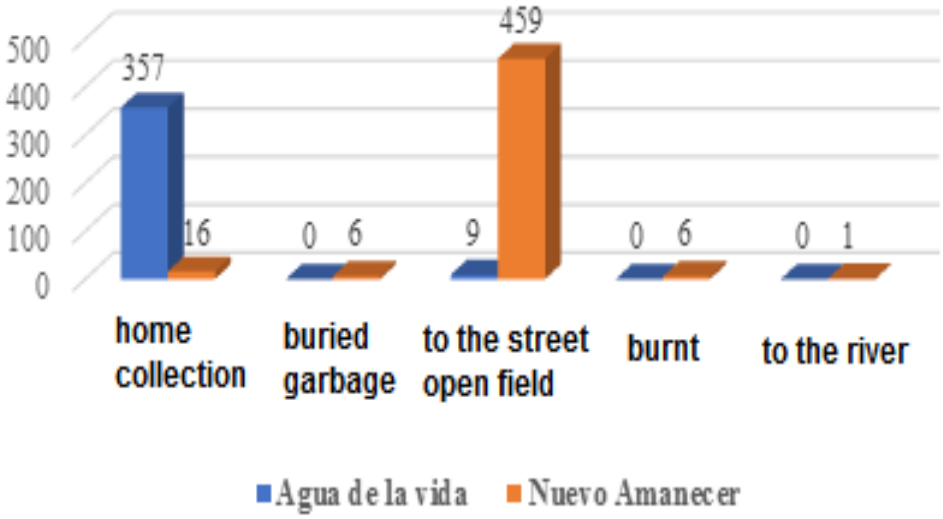


Waste management is yet another negative feature for the quality of life of Nuevo Amanecer (graph 5), where people throw their waste onto the street due to the absence, intermittent presence or uncertainty about garbage collection. The garbage is exposed on heaps at certain corners, where it is subject to being scattered by dogs. In Agua de la Vida, there is almost total coverage of household waste collection by the company hired for this purpose by the municipality.

[9] "The situation in district 7 or the northwest of the municipality of El Alto was complicated because there was no discharge point for the treatment of wastewater; therefore, although EPSAS executed the sanitary sewerage connection, it did not authorize the use thereof, i.e. the evacuation of sewage was prohibited. In July of this year, the testing period of the pumping sump that takes sewage from the northwest sector to the Puchukollo Wastewater Treatment Plant started." (Tenorio, G., personal communication, 10 September 2019). The interviews for this research reported that people in Nuevo Amanecer do not know why they cannot connect to the sewer when the connection is already at the door of their home.

Outdoor defecation and uncertainty about garbage collection are two elements that contribute to a specific environmental profile in Nuevo Amanecer and that add to the structural determinants of its population. Durand (2010) describes the profile of marginal urban spaces as places where social inequalities add to environmental inequalities to result in ecological inequalities, with the possibility of falling into an economic, social, political and even judicial risk situation. It is another way to link structural determinants with intermediate determinants of health.

Graph 5. Agua de la Vida and Nuevo Amanecer: waste management (January to October 2018)
Source: 'Mi Salud' Program, El Alto, 2018.



3.3. Frequency of ADDs in children under 5 years of age in two neighborhoods

Based on the structural determinants and intermediate determinants of health reviewed above, the population covered by the Nuevo Amanecer medical office appears to have marked disadvantages. In this case, the structural determinants of health point to a population linked to an indigenous group (Aymara mother tongue in household heads), predominantly mothers with basic education and/or without education, most of them in self-employment and housework. This panorama is complemented by the almost total coverage of drinking water but no sewerage or garbage collection, overcrowding in homes and outdoor defecation in the neighborhood.

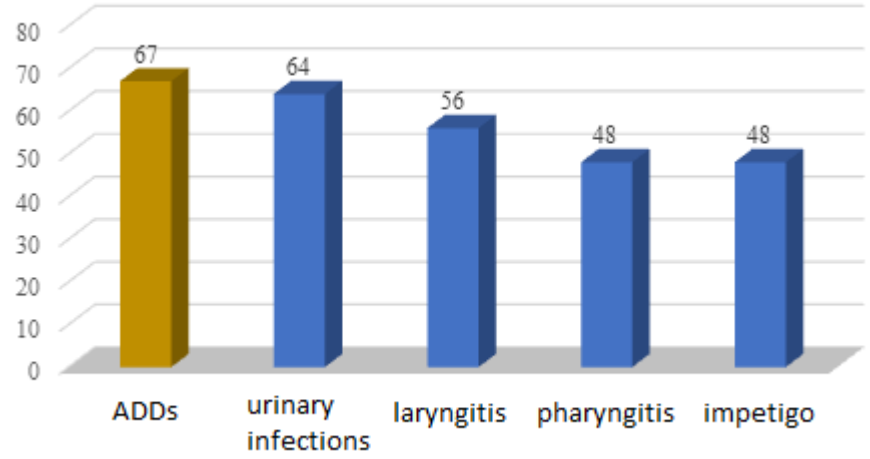
Child health in Nuevo Amanecer (graph 6 here below) makes sense when being read in this context. ADDs first of all affect children under 5 years of age, who are also affected by urinary tract infections[10] and impetigo,[11] diseases linked to exposure to an unhealthy environment and neighborhood. The other two of five recurrent diseases have to do with respiratory tract infections (laryngitis and pharyngitis).

[10] Urinary tract infections in children can affect the bladder, kidneys and urethra and occur when bacteria, usually located around the anus, make contact with the urinary tract. Medical encyclopedia https://medlineplus.gov/spanish/

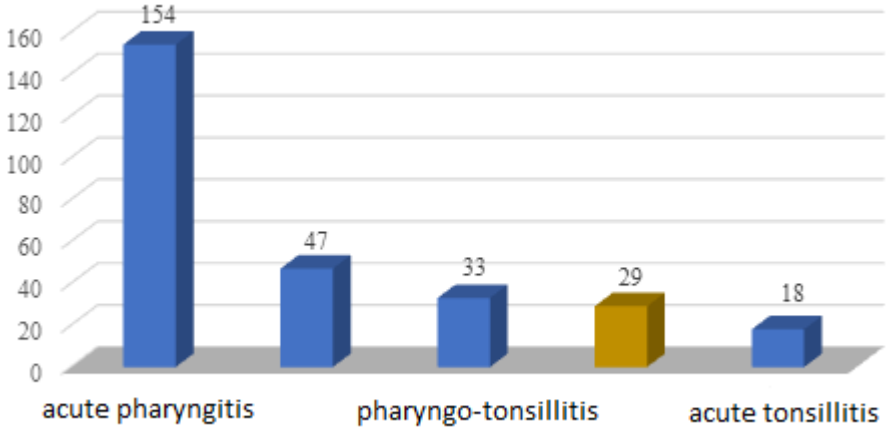
[11] Impetigo is a skin infection caused by staphylococcus and/or streptococcus bacteria when appearing from a crack in the skin. Medical encyclopedia https://medlineplus.gov/spanish/

The incidence of diseases affecting children under 5 years of age in the city of El Alto is ARIs and ADDs, in that order. The reality in the medical office of Agua de la Vida confirms this pattern of behavior: four of the five main diseases in children under 5 years of age are respiratory problems. ADDs rank fourth in terms of incidence. The data on chronic malnutrition are relevant because food has to do with care tasks, which, as mentioned above, are exclusively performed by mothers in Nuevo Amanecer, where this does not appear among the first five diseases. If ADDs and malnutrition are considered to be part of the same circle, the relevance is increased in Nuevo Amanecer because ADDs could be caused exclusively by environmental factors linked to the material quality of life of the households.

Graph 6. Nuevo Amanecer: diseases in children under 5 years (January to October 2018)
Source: 'Mi Salud' Program, El Alto, 2018.
*The table shows the five most common diseases in each office.



Graph 7. Agua de la Vida: diseases in children under 5 years (January to October 2018)
Source: 'Mi Salud' Program, El Alto, 2018.
*The table shows the five most common diseases in each office.



Escóbar (2018) states that the impact of the disease on children's health may have stronger long-term effects than in other life cycles. Children under 5 years of age in Nuevo Amanecer are exposed to conditions conducive to triggering diseases related to their environmental conditions both within their homes and in the neighborhood.

In Nuevo Amanecer, the mothers interviewed identify the importance of hygiene and boiling water for meals, and they declare that they are the main caregivers of children under 5 years of age. However, their perception also somehow normalizes disease: “Once he has been sick for almost a week [...], I have been told that it is normal when children want to start walking or talking”; “When they are out in the cold, they also get sick with diarrhea, right?”. Doctors also consider diarrhea is inevitable, although they insist that it occurs less frequently in children under 5 years of age because they are in the direct care of their mothers.

4. Territorial segregation and inequality in access to water and sanitation

The arrival of drinking water in Nuevo Amanecer without the corresponding sewage system should not be described only as incomplete care to the population and without consequences. According to this research, in the case of children under 5 years of age in the studied districts, access only to the water service does not guarantee their health if the water is contaminated due to lack of basic sanitation. The quality of water arriving in the area is questioned by the inhabitants, especially by women who use this element to carry out care tasks.

The almost total supply with drinking water is nuanced with problems relating to the quality of the liquid. The interviews reflect the fact that water does not reach the entire population of Nuevo Amanecer with the same quality and frequency. At the same time, it is seen that this has not been a problem for its inhabitants so far, in the sense of water quality becoming the target of a demand.

Several testimonials from women reveal at least doubts about the quality of the water: "because this is how the water comes out of the tap, sometimes it is dark, you cannot drink it" (Sonia, 28 years old); "Saturday there is no water, and when it comes, first we receive water that is dirty" (Rosalia, 22 years old); "Sometimes the water is not drinking water or is not clean [...], sometimes we make a filter with a cloth and the cloth becomes stained or dirty" (MF, doctor).

Nuevo Amanecer is an area where the different levels of the State have incomplete presence and shortcomings. The central level has entered with the water service, but not complying with the sanitary sewerage. The municipality does not comply with garbage collection, and the unfinished procedures for the ownership of plots also hinder the neighborhood's access to other services (sidewalks, connection to the sewerage, etc.). In the 'Lotes y Servicios' Network, the Departmental Government has no local outreach and the local residents must fight for receiving care at the centers located on the main road and saturated even with patients arriving from provinces. With the 'Mi Salud' program, the Ministry of Health fills these deficiencies in medical care, but the services are makeshift, delivered more by the enthusiasm of the neighborhood leaders and political ties than based on actual planning of the medical service.[12]

The Nuevo Amanecer zone is a formal part of the 'Lotes y Servicios' Health Network; however, it is outside that network. It is within the city, but without being part of the city due to inconclusive links with the State (plots without property deeds, no sewerage service, women without schooling, citizen security,[13] etc.) and even because of the absence of some links with the market (local transport, supply centers). Antequera (2010: 28) conceives this *being*

[12] A neighborhood medical office is opened at the request of the neighborhood council and with the commitment to provide a space in its social office for the work of the doctor and nurse. The doctors themselves report cases of two professionals sharing a single office and a lack of supplies. At the time of the fieldwork, Nuevo Amanecer had closed the toilet due to a lack of water.

[13] Police presence due to public insecurity is an issue not addressed by this investigation, but it is a demand felt and prioritized by the local residents. In terms of health, the demands are also expressed in terms of the physical and visible presence of the service: a third-level hospital is a demand in the leaders' discourse.

without being of the peri-urban areas as a sign of their exclusion and "exclusion in the city can also be understood as the impossibility of access to these opportunities offered by the urban environment".

If the inhabitants of the peri-urban areas of El Alto have chosen to live there not forced by rural-city migration but due to economic causes, even if they consider these conditions as transitory (Poupeau, 2010a), the moment of the statistical photography is being impacted by conditions of inequality in relation to the other population groups that did have the means to choose other spaces to live in. The porous boundaries of inequality that can be crossed under certain circumstances (Reygadas, 2008) are located, however, on a fabric of socially constructed inequalities, mediated by power relations and resulting from and containing a historical accumulation (Reygadas, 2008; Tilly, 2000) that deserves to be part of the investigation.

If one looks at the most vulnerable population, such as inhabitants under 5 years of age, these conditions of inequality can cause consequences in their biological development, if we agree with Sequera (2018) that inequalities in health increase over time.

5. Boundaries impeding access to water and sanitation

As stated above, in both urban territories of El Alto there is total (Agua de la Vida) and almost total (Nuevo Amanecer) coverage of drinking water, but with significant differences in basic sanitation coverage. The arrival of water only contributes to alleviating the material conditions of life in Nuevo Amanecer, where the population has unmet needs in a territory with a large shortage of equipment.

This phenomenon has been explained by Reygadas (2008) as a dialectical relationship "between the mechanisms that cause differentiation -which have multiplied with globalization and the technological revolution- and the mechanisms of compensation, which have deteriorated or lagged behind, without acquiring the institutional consolidation necessary to regulate, limit and cushion the new dynamics of social exclusion." The indicators of occupation, schooling of mothers and ethnicity combine to shape a population with profound disadvantages in Nuevo Amanecer, while compensation mechanisms (drinking water, housing ownership and health services in the neighborhood) fail to neutralize the effect of those adverse structural conditions. Inequality compensation mechanisms cannot hide their problems when analyzing qualitative information. Drinking water is of dubious quality (even that of the medical center) and its supply is intermittent. The ownership of dwellings is rather the ownership of land without legal recognition. The health service operates in precarious conditions and is confined to vaccination and nutritional support services for the child population.

Thus, with the provision of water and health services in the territory, its inhabitants may be faced with the "fiction" of these basic needs being met and are faced with the other problems that may appear (consumption of contaminated water, poor diagnosis in the health service). This implies that mechanisms designed to achieve equality can lead to other forms of inequality or enhance other aspects of inequality (Reygadas, 2008: 46).

Bayón (2015) refers to "exclusionary integration" or "unfavorable inclusion" to describe the process in which the State acts or omits to act in order to create walls to prevent the passage of disadvantaged sectors. The boundaries of inequality (permeable, porous, to some extent flexible) can appear physically, symbolically or through legal devices (Reygadas, 2008). The analysis of the disadvantages expressed in Nuevo Amanecer, the actions of the State and its legal/bureaucratic devices seem to also act as a wall that prevents the population from accessing vital elements to improve their quality of life such as sewerage, property deeds, planimetry, sidewalks, asphalting in the neighborhood. Other symbolic boundaries stand between neighborhood leaders and grassroots levels (women) to prevent the circulation of information about why there is no sewerage system, or legal devices between neighborhood leaders and government authorities that seem insurmountable. However, leaders who engage in the political struggle between "yellow" and "blue" supporters (party ruling the municipality and party ruling the central government) in order to respond to the demands of their bases and get a positive assessment in management tasks, seem to have ways to cross the boundaries, even though this often entails cronyistic relations.

On the other hand, the relationship between inequalities and the social determinants of health can also be instrumentalized through the universalizing and success-oriented discourses of State actions in the struggle to close inequality gaps. In this regard, Sequera (2018: 273) notes that "wide inequalities can occur in different subpopulations that run the risk of being hidden by central measures such as averages, medians and large percentages". This implies that the successful achievements of the Plurinational State in drinking water coverage, which show an expectant picture in terms of rights coverage, may also conceal conditions of discrimination and disadvantage for vulnerable populations in certain areas of the city.

Conclusions

The analysis of two population segments shows that the 'Lotes y Servicios' Network, the El Alto network with most cases of ADDs in children under 5 years of age, is not homogeneous in socio-economic terms. The prevalence of diarrheal infections in children under 5 years of age is correlated with high inequality and neglect of a population with higher ethnicity, lower schooling (especially among women) and precarious employment. These structural conditions of the most affected population (Nuevo Amanecer) coincide with inadequate material conditions for an acceptable quality of life, which is an expression of the absence of the State in the fulfillment of rights and the granting of services.

Sanitary sewerage, occasional garbage collection, stormwater drains (in the face of flooding of the streets), pavement, and property rights are aspects denied in fact to the population of Nuevo Amanecer, forming and reproducing a human sector settled in conditions of disadvantage and inequality compared to other neighborhoods or areas of El Alto.

Official statistics pointing to the success in water and sanitation coverage reflect a reality that conceals the situation of sectors of the population affected by inequality. Access to water without sanitation, as is the case of Nuevo Amanecer, does not guarantee the health and well-being of this population. Moreover, a focused inquiry reveals the absence of the State in the fulfillment of other rights and the provision of services. Problems related to quality and intermittent service provision are also not reflected in the statistics.

The socio-economic information, expressed here as the social determinants of health, becomes more meaningful when it can be nuanced with the collection of information in the field. The analysis of qualitative information points to latent problems, as happens in the case of Nuevo Amanecer with water quality and intermittent provision; the same goes for other rights such as access to property deeds of the land they occupy.

From a methodological perspective, the analysis of the socio-economic indicators of a localized population rather than using administrative “territorialities” allows for a more precise inquiry (Poupeau, 2010b). Thus, research can avoid focusing on the intersecting territorialities of state entities present in space, without being able to cover any services or rights completely, and sometimes even interfering with each other in that purpose. The municipality organized in districts and the health system organized in networks, both in different geographical areas, act in parallel lines with weak meeting points to face a common problem such as the impact on the health of the most vulnerable population. This is the case of the 'Mi Salud' Program, with the Ministry of Health, which is present in the territory fulfilling a political commitment with leaders of the neighborhood councils but without having identified the health problems of the population.

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