Extreme-Heat and Air-Pollution Risks for Early Childhood Development in Latin America and the Caribbean

Preliminary draft

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Abstract

This report addresses the significant challenges faced by Latin American and Caribbean (LAC) children due to impacts of extreme-heat and air-pollution exposures on early childhood development (in utero to age 5). First, it introduces a framework for understanding how exposures can impact various dimensions of early childhood development, such as birth outcomes, mental health, physical health, cognitive development, and physical growth. These effects are likely to interact concurrently and dynamically across children's life cycles, affecting developmental stages in early life and beyond age 5, within an ecological framework that includes families, communities, services, and infrastructure that may mediate or intensify these impacts. Second, using data on child population, air pollution ($PM_{2.5}$), temperature (UTCI), and economic vulnerabilities in LAC, we provide distributional analyses of environmental burdens for children across economies in the region from 2000 to 2020. We show that in 2020 40.6 million children (86.7 % of the child population) were exposed to $PM_{2.5}$ levels above $10/m^3$, the level considered safe by the World Health Organization (WHO). This number was 7.9 million higher than in 2000. Also, 3.52 million additional children were living in places with 3 months or more of temperature above 32°C in 2020 relative to 2000. Moreover, 5.99 million children (12.8% of the child population) were exposed to both air pollution above $15/m^3$ and 3 months or more of temperature above 32°C in 2020, an increase of 4.85 million children compared to 2000. We finish the report by summarizing the academic literature on the effects of air pollution and extreme temperature on early childhood development and providing policy guidance to address these issues.

Keywords: Climate, Air Pollution, Extreme Heat, Early Childhood Development, Health, Nutrition, Education

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1 THE CHALLENGE: EXTREME HEAT AND AIR POLLUTION TRENDS AND CHANGES IN EARLY CHILDHOOD DEVELOPMENT

1.1 Overview

The countries of Latin America and the Caribbean (LAC) are facing increasing exposures to extreme air pollution and heat (UNOCHA and UNDRR 2023, 8). Children in Latin America's mega-cities are exposed to high levels of outdoor air pollution, and indoor air pollution is also a concern (Laborde et al. 2015, 202).[1] A case–control study conducted in 14 districts in the City of São Paulo, Brazil found increasing risks of early neonatal death with higher exposure to traffic-related air pollution, such that mothers exposed to the highest quartile of a distance-weighted traffic-density measure compared with those less exposed exhibited approximately 50% increased mortality risks (De Medeiros et al. 2009). Research elsewhere has linked ambient air pollution exposures during the prenatal period to poorer birth and developmental outcomes (for birth outcomes, see Liu, Miao, et al. (2022) and Liu, Behrman, et al. (2022); for a general review of research on pollution and birth and early childhood health and development, see Landrigan et al. (2019)). At the same time, temperatures are rising in the region. *(Add example. Add source.)* Rising temperatures are associated with increased frequency and intensity of severe weather-related events and the facilitation of conditions conducive to the spread of mosquito-borne illness (PAHO 2024; UNECLAC 2024b; UNOCHA and UNDRR 2023, 8–9).

Moreover, in Latin America and the Caribbean "a complex environment of risk drivers" exacerbates the potential impact of climatic and pollution exposure (UNOCHA and UNDRR 2023, 8). Drivers include dense urban populations in cities highly vulnerable to natural hazards; a "double trap" of low economic growth and high levels of inequality; political instability; population displacement and large-scale migration; and high rates of violence that can exacerbate inequality and inhibit disaster responses (PAHO 2024; UNECLAC 2023, 13; UNOCHA and UNDRR 2023, 8–9). Social and economic risk drivers may compound vulnerability to climatic and environmental hazards, especially for communities and individuals facing economic, social or political marginalization and associated barriers to accessing infrastructure and public services.

Children's exposure to air pollution and rising temperatures will impact their development and short- and long-term outcomes, which can exacerbate inequalities in the region. Children are more vulnerable to climatic and environmental hazards on multiple dimensions compared to adults. A recent UNICEF report highlights reasons for children's particular vulnerability to climate hazards and associated disasters (Rees et al. 2021, 11):

> They are physically more vulnerable, and less able to withstand and survive shocks such as floods, droughts, severe weather and heatwaves...They are more at risk of death compared with adults from diseases that are likely to be exacerbated by climate change, such as malaria and dengue. They have their whole life ahead of

1. Laborde et al. (2015) review a variety of other important pollutants in the region that are important for children, including lead, asbestos, mercury, and arsenic exposures. See UNECLAC (2024a) for trends in air pollution exposure.

them—impacts resulting from climate and environmental exposure at a young age can result in lifetime consequences.

Rees et al. (2021, 11) and Landrigan et al. (2019, 2390–2391) also highlight children's physiological vulnerability to toxic substances, such as lead and other forms of pollution, ususally at ower doses than adults. At the earliest stages of life, pollution exposures "can result in lasting injury to cells and tissues that increases risk of disease in childhood and can also reverberate across the life span" and can "undermine efforts to enhance children's development though improved nutrition, early learning and better health care." (2390–2391).

These exposures are widespread and cumulative. UNICEF estimates that more than 99% of children have exposure to at least one event related to climatic and environmental hazards, shocks and stresses. The same report informs that 1.7 billion children are exposed to at least three and 80 million to at least six of these events (Rees et al. 2021). The Caribbean is one of the regions with the highest risks for these cumulative effects.

The lack of public services to alleviate the effects of these shocks might create more inequalities and exacerbate existing social vulnerabilities already widespread in the region.

This report focuses on the consequences of air-pollution and extreme-heat exposures in LAC for children in utero until year five, in connection with other vulnerability factors such as poverty and service accessibility. Other climatic and environmental factors are also potentially important for the welfare of children in this region, but due to data availability, and limited literature scope, we will not analyze them here.[2]

1.2 Theoretical framework

We utilize the framework in Figure 1.1 and highlight several critical features relevant to this report.

First, child development encompasses multiple components, as illustrated in the bottom (gray) box in the figure. We identify five key dimensions: birth outcomes, mental health, physical health, cognitive development, and physical development. These components can interact either contemporaneously or over time (e.g., the dynamic complementarities highlighted by Cunha and Heckman (2008)). While our framework focuses on dimensions discussed in our literature review, we acknowledge that other important aspects of early childhood development (ECD) are not addressed here. For instance, the Nurturing Care Framework includes health, nutrition, learning, relationships, and safety and security (Black et al. (2021)). We limit our discussion to literature on the effects of air pollution

2. For example, Carvalho (2024) cites deforestation first among the "top five" environmental issues facing South America. Between 1990 and 2010, South America experienced the world's highest annual rate of forest loss; since 2010, the region has experienced the second largest highest annual forest loss rate in the world, after Africa (Alves 2023; FAO 2020). Research elsewhere has linked deforestation to poorer birth outcomes and early health outcomes for children, possibly attributable to malaria exposures, and reduced dietary diversity among children (Fuentes Cordoba 2024; Galway, Acharya, and Jones 2018). The other key environmental factors highlighted by Carvalho (2024) are soil erosion, glacial melting, water pollution and scarcity, and sea level rise. We will touch on these factors as they connect to the factors that we consider empirically in this paper, and in our discussion in the concluding section.

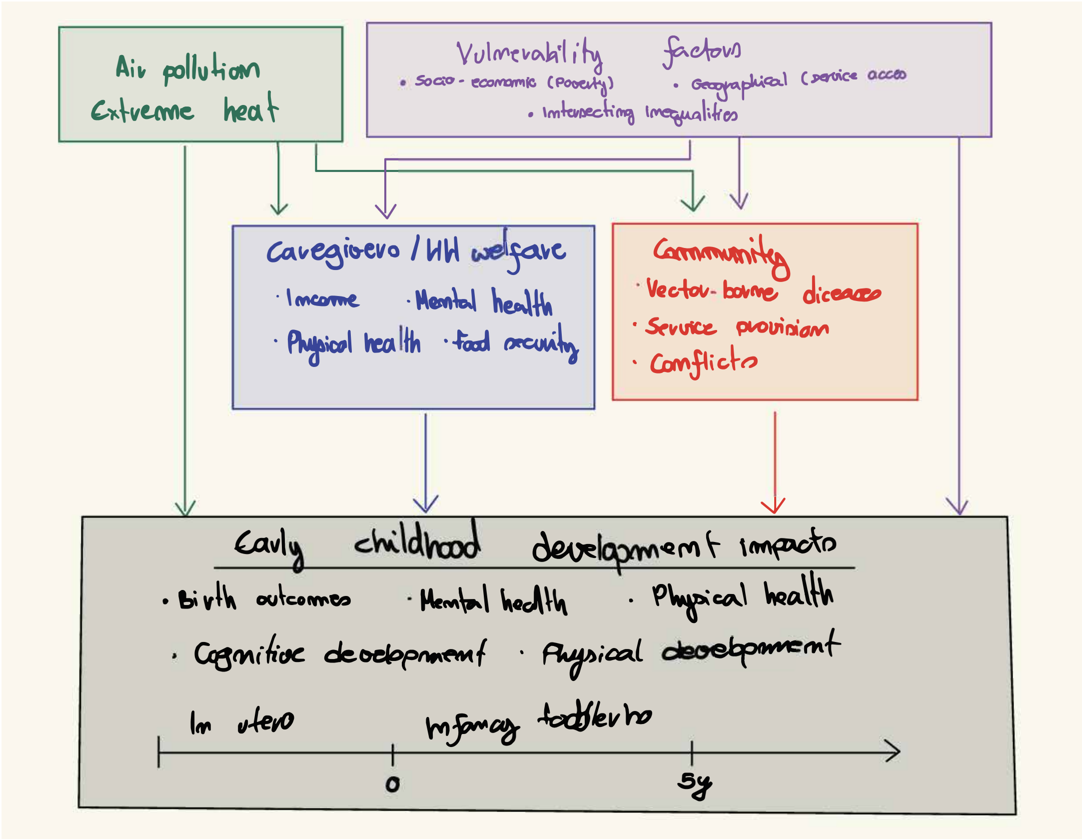
and extreme heat on ECD, recognizing that, despite growing research, studies addressing all ECD dimensions remain scarce.

Second, child development is a dynamic process with several life-cycle stages within the neo-natal, infancy, and toddlerhood phases (ages 0-5). In this report, we focus on impacts occurring from the in-utero period up to age five. The importance of different developmental components may vary across ages within stages and across these stages, so empirical findings and their implications may also differ by age and stage. Although this report does not cover stages beyond age five, it is essential to consider that shocks experienced by children aged five or younger can significantly impact later stages of development.

Third, extreme heat and air pollution can directly and indirectly impact ECD dimensions. The arrow in Figure 1.1 linking the green and gray boxes illustrate the direct effects of exposure on development, such as biological impacts like heat stress and respiratory complications. Indirect effects stem from influences on caregivers/households (blue box) and communities (red box) that may be amplified by vulnerability factors (purple box). For instance, extreme heat can lead to crop failure, resulting in negative income shocks that reduce household investment in children's human capital and nutrition, particularly for children living in greater poverty and with lesser access to health and other services. An important aspect of these indirect effects is the potential for interaction among mechanisms, which may jointly impact various aspects of child development. We limit the mechanisms in the framework to those discussed in our literature review.

Fourth, both extreme heat and air pollution affect child development directly and indirectly through the same ecological layers, although the magnitude and specific mechanisms may vary. For example, indirect effects from vector-borne diseases may be significant for extreme heat but are unlikely mechanisms for air pollution.

Figure 1.1: Environment and children framework sketch



Note: This framework sketch focuses on extreme heat, air pollution exposures, and early childhood development (ECD) from in utero to age 5. The green box represents environmental factors, specifically air pollution and extreme heat exposure, that influence ECD directly and indirectly. The purple box captures vulnerability factors that may affect children's development and the impacts of environmental factors. The blue box contains mechanisms related to caregivers and household welfare that impact ECD. The red box highlights community-level mechanisms affecting ECD outcomes. The gray box represents various dimensions of children's development influenced by the factors and mechanisms outlined in the boxes above.

1.3 Report objectives and outline

In this report, we provide novel data and identify hotspots[3] in LAC where air pollution and extreme heat overlap with geographical distributions of economic inequality and children. We combine child population distributions with gridded data on the distributions of air pollution by aerosols, and gridded data on share of time experiencing extreme heat exposure. Using these data and building on Feng et al. (2024) and Santos et al. (2024), we compute cell-level, sub-national, and national distributions of air pollution by aerosols and extreme heat exposures for children for countries in LAC.

Given this information, we provide national and regional rankings in LAC for the countries and regions where children face the greatest to the least extreme heat, and pollution burdens. These rankings compare the national and regional child-population weighted climatic burden measures, and rely on the within-country and regional distributions of children and the

3. *Note: we have not done the hot spot analysis, but this is a possible direction if we want to proceed in this way. We have in Figures* **??** *and* **??** *and Table* **??** *computed child-specific national heat and pollution exposure burdens, aggregated up from gridded data. Building on these and the Poverty Map shown in* **??***, we could identify hotpots as proposed below.*

distributions of climatic burdens. Furthermore, we identify countries and regions that rank jointly high in multiple dimensions of climatic burdens, and combine the gridded spatial distributions of climatic exposures burdens for children with the spatial distribution of poverty and service accessibility in Latin America and the Caribbean to pinpoint areas in LAC where children are most at risk of climatic burdens.

This report is structured as follows. Section 2 describes our data used in our distributional analysis of hazards and the burdens facing children in LAC. In Section 3, we first present a distributional analysis of the location of climatic events and the intensity of these events. Second, we present a population distribution analysis of children in LAC. Third, we map poverty indices. Finally, we overlay these analyses to identify the areas where we have the presence of children, economic vulnerability, and adverse climatic events. This exercise can inform the policy, government, and NGO communities about important "hot spots" of vulnerability for targeting social services to alleviate exposure consequences.

Having presented exposures, in Section 4 we turn to a reflection on likely outcomes of exposures by referencing existing research on the effects of exposure to air pollution and extreme heat on early child development. We review literature on two groups of outcomes: Health and nutrition; and Learning, cognitive development, relationships and behaviors. The age range of our analysis is from the in-utero period to 5 years old, as we focus on early children development. Finally, we review literature on prevention and mitigation strategies—infrastructure and resilience.

In section 5 we describe how countries are investing in tools to deal with the rising climate crisis. After that, we give recommendations on two dimensions. First, we discuss how the region can implement policies to alleviate exposure to air pollution and extreme heat. Second, how can public services alleviate the effects of exposure to increasing air pollution and temperature levels.

Section 6 concludes. Here, we reflect on key findings and policy recommendations, and discuss key areas in need of further evidence. We acknowledge that the scope of climatic and environmental hazards affecting children is broader than what we are able to analyze here. Drawing on other literature, we reflect briefly here on potential implications for young children of other environmental issues such as sea-level rise, vector-borne diseases, deforestation, and other related issues.

2 Distribution of climatic shocks

2.1 Data and methods for computing child population climatic burdens

In this section, we describe our sources for population, air pollution, and extreme heat data. For a particular subnational, national and supranational region, we compute the child-population-weighted pollution or heat exposure measures using the distribution of children jointly with the distribution of climatic burdens at the finest level of geography where data are available. Our statistics inform policy makers where a specific population group, in this case children 0 to 5, faces different magnitudes of climatic exposures. Given that the spatial distribution of children in Latin America and the Caribbean might not overlap with the spatial distribution of climatic burdens, it is essential to combine the population distribution and climatic distribution data jointly to identify locations where children are most at risk.

2.1.1 Population data

We generate cell-specific global population estimates based on the WorldPop population estimates dataset. The WorldPop gridded data provides total population estimates at 30 arc-second grids ($\sim$ 1km at the equator), and it is aggregated based on up to administrative level 6 population data from global economies. Population estimates are provided by age and gender categories, which we restrict to 0-5 years to calculate child population.

2.1.2 Climatic and environmental hazard data

Air pollution data. Atmospheric pollution by aerosols is important to human health and well-being, especially when there is a higher concentration of $\mathrm{PM}_{2.5}$ particles that are smaller then 2.5 micrometers (Jacobson 2002; Bishop, Ketcham, and Kuminoff 2023; Currie et al. 2015; Currie and Walker 2011).

We use (Donkelaar et al. 2016) estimates available at 0.01° as our measure of air pollution. We aggregated the data into $1^{\circ}\times1^{\circ}$ grids, calculating the annual average $PM_{2.5}$ level for each grid based on the cells within it. We aggregate these measures to child population mean exposure for higher geographical groups using cell-level information.

To have a benchmark for air pollution severity, we use interim targets (ITs) from the World Health Organization (WHO) as a threshold analysis (*WHO global air quality guidelines,*). The ITs were defined by WHO to help guide public policy decisions on air quality improvement based on different pollutants. The $PM_{2.5}$ concentrations corresponding to Interim Targets (IT) 4, 3, 2, and 1 are 10, 15, 25, and 35, respectively.

Temperature data. We use the fifth generation of the European Center for Medium-Range Weather Forecasts (ECMWF) atmospheric reanalyses of global climate: the ERA5-HEAT dataset (Napoli 2020). ERA5-HEAT, a distinct advancement from its predecessors, offers hourly data on numerous climate variables with a spatial resolution of 0.25 degrees. We utilize the Universal Thermal Climate Index (UTCI). an integrative measure of the human-perceived equivalent temperature, taking into account factors like air temperature, humidity, wind speed, and radiant heat (Bröde et al. 2012; Jendritzky, Dear, and Havenith 2012; Jendritzky and Höppe 2017).

Following Feng et al. (2024), within a particular span of time at a particular gridded location, we compute extreme heat facing the average child, measured in units of share of time individuals in this location are exposed to extreme heat, considering multiple temperature thresholds capturing different magnitudes of heat stress. Our main results use 32° as threshold, but we present findings using 26° and 38° in our appendix.

To make the share of time easier to interpret, we transform share of time into months of exposure per year. We check how many children are exposed to 0 to 1, 1 to 2, 2 to 3, 3 to 4, 4 to 5, and 5+ months of extreme heat. We focus our discussion of results on time above 32°, but we also compute these numbers using 28° and 38° of exposure as temperature thresholds.

2.2 Overlapping exposures

To capture overlapping exposures to environmental hazardous conditions, we merge our cell-level information on air pollution, temperature, and child population. With the merged dataset, we calculate the number of children exposed to both poor air-quality levels and months under extreme heat. We combine Interim Targets (ITs) of the World Health Organization and months exposed to hot temperatures to define groups. For example, we calculate the number of children exposed to $PM_{2.5}$ above IT1 — 35 $\mu g/m^3$ — and 3 months above 32° in LAC, its subregions, and countries. Our approach is relevant to reveal the "hotpots" where children are more vulnerable.

2.3 Vulnerability factor datasets

Poverty information

Public service access

3 Climatic burdens for children

3.1 Air pollution and extreme temperature

Between 2000 and 2020, children in the region faced a decrease in air quality and an increase in heat exposure. In 2020, 40.6 million children (87% of the population) were exposed to air quality that did not meet WHO safety guidelines, an increase of 7.9 million children compared to 2000. The number of children exposed to at least three months of temperatures exceeding 32°C nearly doubled in these two decades, reaching 7.53 million. Another concerning factor is the growing overlap of these hazards; in 2020 approximately 6 million children faced extreme heat and high particulate matter (PM2.5) pollution, an increase of 4.85 million children since 2000.

3.1.1 Regional results

Figures 3.1 show the distributions of cell-level $PM_{2.5}$ and time shares above 32° for 2000, 2010, and 2010. These distribution histograms are plotted with cell-level information weighted by the total children population at the cell level. We add vertical lines to indicate Interim Targets and months-of-exposure thresholds. We complement the visualization with shaded areas to make clear the range of values associated with each severity category.

We show that these distributional changes were not driven by changes in the distributions of child populations. We do this by plotting the distribution of cell-level exposures in 2010 and 2020, assuming that the population distribution is the same as in 2000. We show these distributions on the right plots of Figure 3.2. We observe that these distributions overlap almost perfectly for both air pollution and extreme heat, which indicates that if the population distribution did not change relative to 2000, the observed cell-level exposure distributions would be similar to the ones observed using the 2020 population.

According to our results in Figure 3.1 and Table 3.1, exposure to air pollution increased over time in the region. The mean exposure in the region increased from $13.05\mu g/m^3$ in 2000 to $15.96\mu g/m^3$ in 2020. Additionally, although the average cell is exposed to levels concentrated close to the interim target 3, there is considerable variation within the region. In terms of severity, in 2010, we observed cells exposed to levels above the two highest interim targets of the WHO guidelines, a new fact relative to 2000, and an increase in the mass of cells exposed to levels above IT2 and IT3.

According to Figure 3.3, the number of children exposed to unhealthy levels of air pollution increased significantly between 2000 and 2010. Tables 3.2 and 3.3 show that in 2020, 40.6 million (85%) children lived in places with $PM_{2.5}$ concentrations higher than those recommended by the WHO ($10\mu g/m^3$). This is 7.9 million additional children relative to the 2000 results, which corresponded to 72% of the child population. We also observed 200 thousand children in 2020 exposed to levels exceeding the worst severity threshold, a new risk category, as this category contained no observations in the year 2000.

Focusing on extreme heat, children were more exposed to hotter temperatures in 2020 compared to 2000. The mean time per year above 32° in 2000 was around 1 month or 9.5% of the whole year, which increased to 12.5% in 2020. In terms of months of exposure, there was an increase in children exposed to 3-to-5 months above 32° between 2000 and 2020. Tables 3.4 and 3.5 show this increase in the number of children exposed to different month thresholds. From 2000 to 2020, an additional 3.5 million children were exposed to 3-to-5 months of temperatures above 32°, representing around 16% of the child population under five years of age.

The overlapping analysis of extreme temperature and air pollution in the region reveals an increase in the number of children facing both. The heat map in figure 3.4 shows an additional 3 million children facing air pollution levels above IT3 and 4 months of exposure to temperatures above 32°. For IT2 and 4 months of exposure to temperatures above 32°, this increase was 1 million children. Figure 3.4 shows this overlap of vulnerabilities in a more granular dimension. From 2000 to 2020, we observed an increase in the child population mass across combinations of temperature thresholds and pollution levels above $25\mu g/m^3$. Tables 3.6 and 3.7 show that in 2000, there were no children exposed to both air pollution levels above IT2 and more than 3 months of exposure, a phenomenon that is present in both 2010 and 2020.

3.1.2 Subregional results

The increase in mean exposure is similar across subregions, as seen in Table 3.1. The average air pollution exposure increased in all three subregional groups. South America has the highest increase compared to 2000 of $3.6\mu g/m^3$. However, Central America is the most polluted subregion in LAC with an average concentration of $18.1\mu g/m^3$ in 2020.

Taking into account the severity thresholds of pollution in Tables 3.2 and 3.3, Central America is the region where children are proportionally more exposed to worse air quality conditions. In 2000, this was the only region with locations above IT2, and in 2020, it is the only one to have children exposed to the level above IT1. In 2020, more than 15 % of the child population lived in places with concentrations above IT2.

We can also observe an increase in the inequality of exposure faced by children in the same subregion. For example, in the Caribbean region, we see a higher share of children living below IT4 in 2020, 40% compared to 33% in 2000. However, with a higher proportion of worse thresholds, IT3 concentration increased from 2% to 38% of the child population in 2020. These changes indicate a more unequal subregion in comparison to 2000. Figures 3.5 and 3.6 adds evidence to it, as shown by the percentiles distance increase compared to 2000.

Similarly to air pollution results, extreme heat exposure within regions and countries increased on average and also exacerbated exposure inequalities relative to 2000. Table 3.1 shows higher shares of the year above $32°C$ in all three groups. The Caribbean has the highest increase, 4%, corresponding approximately to 15 additional days above $32°C$.

Tables 3.4 and 3.5 indicate that South America is proportionally the worst subregion when considering the number of months of exposure. In 2000, 470 thousand children were exposed to 4-to-5 months of temperature above $32°C$, and it was the only region with child exposure above 4 months. Our data shows that this number increased to 2.32 million, accounting for 7.59% of the child population in this position.

Similarly to increases in pollution inequality discussed previously, Figures 3.5 and 3.6 show increasing percentile exposure distances relative to 2000. Indicating that the distance between the level of exposure faced by the lowest percentile and the highest percentile is wider. These patterns are consistent across subregions in Latin America and the Caribbean.

Regarding overlapping vulnerabilities, Table 3.6 shows that they are present in Central America and South America and increased considerably between 2000 and 2020. In 2000, South America was the only subregion with children exposed to both IT3 air pollution levels and more than 4 months of hot temperatures, with 60 thousand children. However, in 2020 this number increased to 1.49 million. In addition, 170 thousand Central American children were also exposed to these overlapping vulnerabilities.

3.1.3 Country level

Figures 3.7, 3.8 maps countries in Latin America and the Caribbean colored according to their weighted mean exposure. Categories are created based on distribution quintiles in 2000 for each measure to make it easier to see increases in mean exposure over time. Darker colors indicate worse levels of exposure.

Confirming what we discussed above, mean air pollution levels increased in multiple countries in the region. There are two main areas where we see in the region, south of Central America and South America. We see that many countries that where in the 1st, 2nd and 3rd quintiles as Brazil, Peru, Colombia, Guiana and Suriname, have pollution levels corresponding to the 5th quintile in 2020. Table F.1 shows the mean for the countries in the region.

For temperature, we also observed a transition of countries from lower quartiles to the first quintiles, confirming the increase in hot days discussed before. Specifically, South of Central America and some countries as Bolivia, Chile, and Paraguay.

The inequality of exposure faced by child populations also increased over time. We also observe an increase in exposure inequalities to air pollution and hot days within countries. Figure 3.5 plots three numbers for each country in South America: air pollution exposure for the 20th percentile of children population (left dot), the 80th percentile (right dot), and population weighted mean exposure (middle dot). Relative to 2000, countries' means shifted to the right for both measures, indicating higher pollution and temperature exposure levels. Additionally, the distance between p20 and p80 increased for some countries, implying more unequal exposure within economies.

Moreover, Table F.2 shows that, over time, multiple countries have more child population in higher pollution thresholds. For example, Brazil had all of its population concentrated below IT3 before 2010, but in 2020 400 thousand children were exposed to pollution levels above IT2. Additionally, concentration on locations following WHO guidelines decreased, which indicates an increase in within country exposure inequality. Similar patterns are also present in other locations as Argentina, Bolivia, Honduras and Peru.

Extreme temperature inequality exposure shows a similar pattern when observing month thresholds. The majority of the countries saw increases of children concentration in higher thresholds, however, a limited number of countries such as Peru, Nicaragua and Venezuela, have children concentrated in unpopulated categories in 2000.

Overlapping exposures show a concerning increase in vulnerability in some countries. For instance, Brasil had an increase of 830 thousand children exposed to both air pollution levels above IT3 and 4 months of exposure above 32 ° in 2020 relative to 2000. Another country with a concerning increase is Colombia, where an additional 270 thousand children were exposed to levels above IT3 and 4 months of exposure above 32° in 2020.

4 Linking exposures to likely impacts on the under-five population

In this section we summarize selected studies on the impacts of air pollution and extreme heat on different components of child development for children five and younger. We focus on studies from LAC, but include some studies from other parts of the world, particularly for topics for which we have not been able to find many studies on LAC.

4.1 Nutrition and growth

4.1.1 Pollution

Rangel and Vogl (2019) use data from satellite-based fire-detection systems, air monitors, and vital records in Brazil to study how in-utero exposure to smoke from sugarcane harvest fires affects birth outcomes. Exploiting daily changes in fire locations and wind directions for identification, they find that late-pregnancy smoke exposure decreases birthweight, gestational length, and in-utero survival. Being upwind versus downwind of fires, for example, increases birthweight by 98 grams and gestation by 0.35 weeks. Fires less associated with smoke exposure, on the other hand, predict improved health, highlighting the importance of disentangling pollution from its economic correlates.

4.1.2 Temperature

Bakhtsiyarava et al. (2022) study the impacts of prenatal exposure to extreme temperature on children birthweight in Latin American cities. The authors combine monthly average temperature data with birth record of cities in Brazil, Mexico, and Chile from 2010 and 2015 to investigate the correlation between temperature and birth outcomes. The study finds that there is a negative correlation between higher temperature exposure and lower birthweight, with the cumulative exposure effects being driven mainly by the exposure faced in the last trimester of pregnancy.

Sanchez (2018) studies the impact of exposure to unusual cold days on children height-for-age at the age of 5 in the Peruvian Highlands. The empirical approach relies on variations in temperature exposure among children within clusters, which are determined by differences in birth dates, specifically at the monthly level, in regions where frosts are common. The author finds that additional exposure to unusually cold months during the first three years of a child's life reduces their height-for-age at 5 years old by 2.7%, with this effect disappearing by age 8.

4.2 Physical and Mental Health

A case–control study conducted in 14 districts in the City of São Paulo, Brazil found increasing risk of early neonatal death with higher exposure to traffic-related air pollution, such that mothers exposed to the highest quartile of a distance-weighted traffic density measure compared with those less exposed exhibited approximately 50% increased mortality risk (De Medeiros et al. 2009)

4.2.1 Pollution

4.2.2 Temperature

4.3 Relationships and behaviors

4.3.1 Pollution

4.3.2 Temperature

Wu et al. (2023) study the effects of early childhood climate on home environment. By examining data on children's household conditions, the study explores how variations in climate during the first years of life impact the quality of home environments in rural China. The findings reveal that households in regions with harsher climates tend to have lower-quality home environments.

4.4 Safety and security

4.4.1 Pollution

4.4.2 Temperature

4.5 Learning and cognitive development

4.5.1 Pollution

4.5.2 Temperature

Odo et al. (2023)'s cross-sectional analysis examines the relationship between long-term exposure to ambient air pollution and cognitive development in children aged 3–4 years across 12 low- and middle-income countries. Using data from a large sample, the study investigates the potential impact of air pollution on cognitive abilities in early childhood. The findings suggest a concerning association between higher levels of ambient air pollution and reduced cognitive development at age 3-4, highlighting the importance of addressing air quality issues in low- and middle-income countries to promote optimal cognitive outcomes for children during their formative years.

Sanchez (2018) investigates the effects of children exposure to cold days within the first three years of life on children cognitive achievement and socio-emotional competencies. The study leverages differences in temperature exposure among children within clusters, based on variations in birth dates at the monthly level, specifically in colder areas. He finds that there is no overall impact of unusual cold days on cognitive achievement and socio-emotional outcomes. However, when focusing on girls, the author finds a negative correlation between cold days exposure and cognitive achievement, with a standardised coefficient of -1.5 per cent.

Wu et al. (2023) study the effects of early childhood climate on cognitive development. By examining data on children's cognitive abilities and household conditions, the study explores how variations in climate during the first years of life impact cognitive development and the quality of home environments in rural China. The findings reveal that exposure to more extreme weather conditions, particularly colder temperatures, during early childhood is associated with adverse effects on cognitive development, such as reduced cognitive abilities before age 5. Furthermore, the findings suggesting lower-quality home environments in regions with harsher climates can potentially exacerbate the negative impact on children's cognitive development.

4.6 Infrastructure

Some countries in LAC have been considering climate resilience in their action plan, however the involvement of the region should increase. The Sixteenth session of the Conference of the Parties (COP 16), defined the National Adaptation Plans (NAP) in order to help countries to develop strategies towards climate resilience. According to (OECD 2023) only 12 out of 33 countries of the regions has submitted their NAP to UN. An alternative to it is the inclusion of the climate transition into the National Determined Contributions (NDCs) or their Long-Term Strategies (LTS). Even though these are alternatives to the commitment to climate resilience transition, nor much progress has been observed in the last years (OECD 2023). The active involvement of the countries in the region is the only path for a sustainable transition to climate resilient enviroments.

Climate resilience is a key factor that can help to alleviate the effects of climatic and environmental shocks on children's development. LAC increasing risk to climate shocks indicates the environmental events discussed before will generate costs to children development in the region. Developing resilience in the precaution and defense can lead to full avoidance of some events, as alerts of poor air pollution quality, or the alleviation of it, as temperature controlling system in hot or cold days.

Climate resilient infrastructure can also help to reduce climate change drivers through sustainable strategies. It is important to consider the sustainable dimension of these facilities, as resource management it is an important topic to reduce climate change pace. For example, this facilities can be equipped with more efficient/sustainable water, emissions and energy system. The installation of solar panels, water storage mechanism or policies to use these resources efficiently can avoid future scarcity in periods of droughts or energy restrictions.

An important aspect for shock prevention is the development of early warning and civil protection system. The unpredictability nature of climatic events makes necessary the existence of prevention system to evacuate or prepare communities to receive these shocks. In the case of natural disasters, this can have a clear and direct impact of saving children's lives, but also help to alleviate household losses by anticipating the events. For air pollution, having a system that can inform households of excessive exposure could avoid health impacts trough the use of masks or avoiding exposure by staying at home.

Specific sector approaches are important to prioritize investments. For example, education providers should be equipped with flood defense mechanism and temperature regulators to minimize negative learning impacts. For the health facilities, the priority is to to provide enough resources to accommodate possible increase on demand for health services and climate related illness when these events happen.

The sector can also contribute with the alleviation of climate change trough specific approaches. Education and health facilities could be helpful in informing agents on the risks, precautions against and information on climate change and its related issues. Another important aspect for early childhood development is developing infrastructures that can guarantee the provisions of these services after climate shocks.

4.6.1 Pollution

4.6.2 Temperature

5 Policy Recommendations

The above discussion suggests at least three major areas of policy.

First, *information* is critical. For governments to develop the most effective policies, they need good information on a fairly localized level about both the distribution of children and about the distributions of different risk factors. There are great heterogeneities within countries so that regionally targeted policies may be necessary to most effectively address risks for children given budgetary constraints. There are also other important information issues. Improvements in warning systems for extreme climate and natural-disaster events, for example, may significantly reduce the negative impacts of such events.

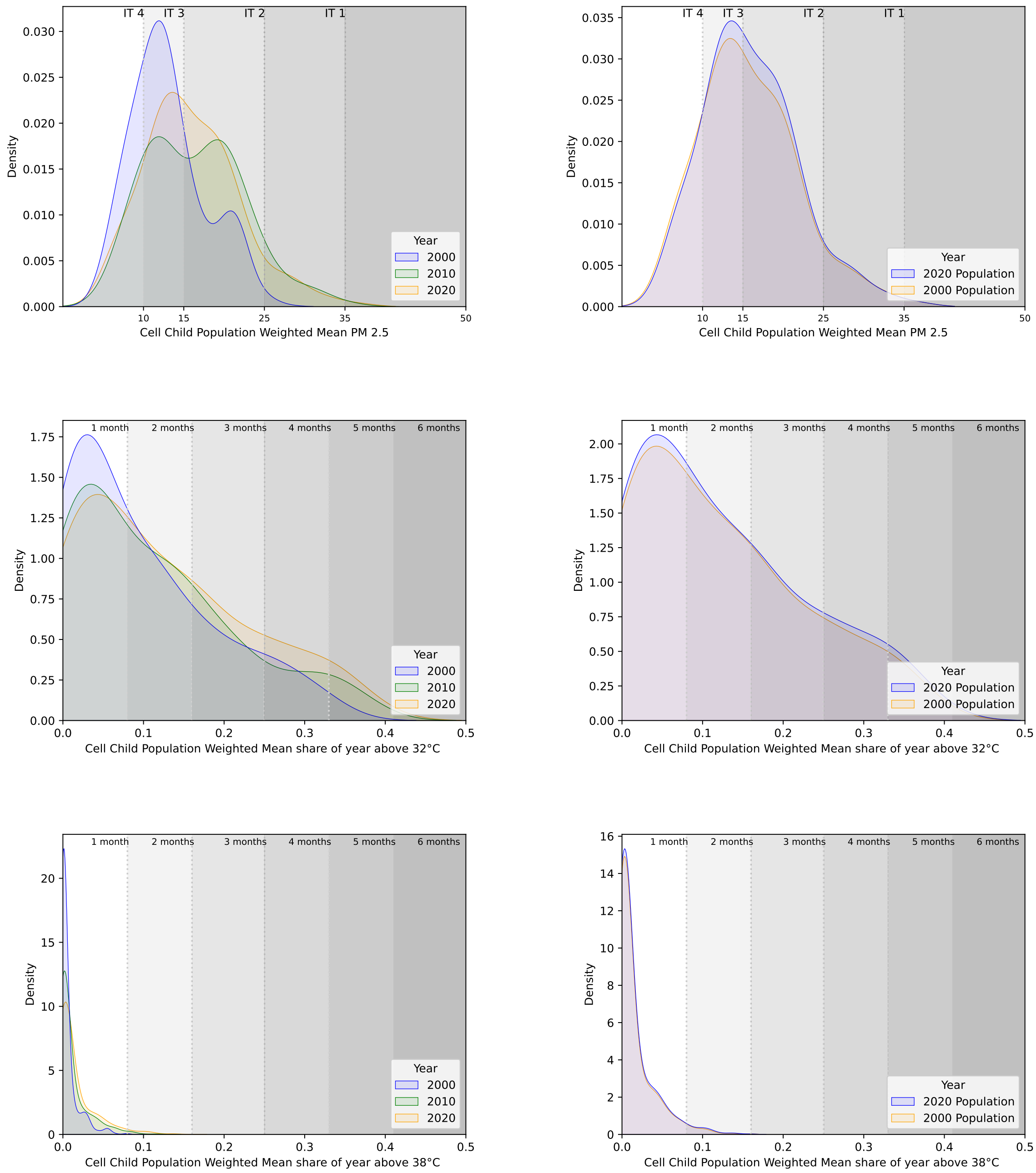
Second, improvements in social and physical *infrastructure* are likely to be critical. Such improvements can be protective to make children and their families and communities more resilient when shocks hit and able to recuperate more quickly and effectively from whatever damaages occur. The previous section gives some examples.

Third, improvements in *social safety nets* are likely to be key as well. The available literatures suggest that family resources are likely to be important aspects of prevention and remediation in the presence of climatic, pollution and natural-disaster shocks. But such family resources often are depleted rapidly by such shocks. Therefore nimble safety nets may be very important.

6 Conclusions

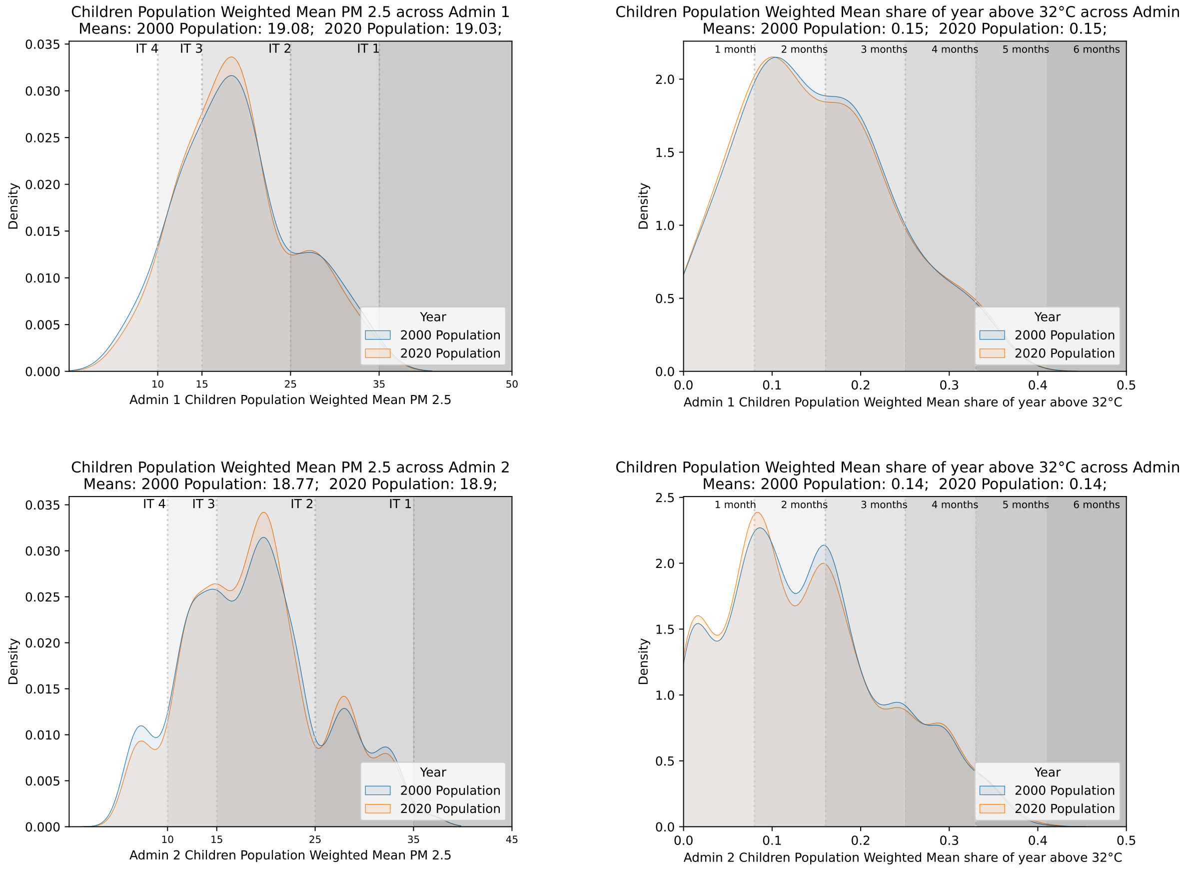
Tables and Figures

Figure 3.1: Cell Child Population means for air pollution and temperature measures by year



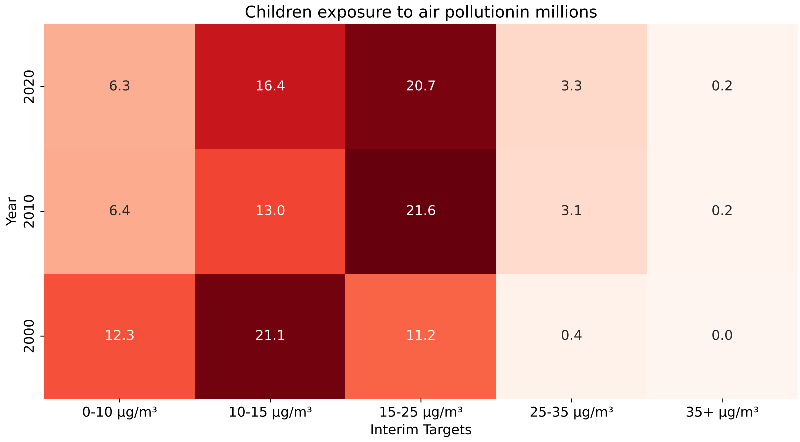
Notes: Distribution of cell-level $PM_{2.5}$ levels, share of time above 32 °, and above 38 ° for 2000, 2010 and 2020. Distributions are weighted by its cell-level population information. On the right, distributions are plotted assuming the same population distribution of 2000 for both 2020 and 2000. Background colors indicate severity ranges and vertical lines indicates severity thresholds.

Figure 3.2

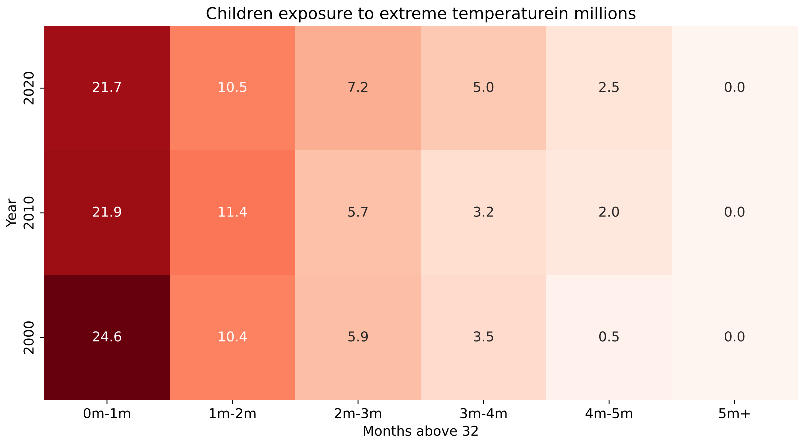


Notes: Distribution of cell-level $PM_{2.5}$ levels, share of time above 32 °, and above 38 ° for 2000, 2010 and 2020. Distributions are weighted by its cell-level population information and assuming the same population distribution of 2000 for both 2020 and 2000. Background colors indicate severity ranges and vertical lines indicates severity thresholds.

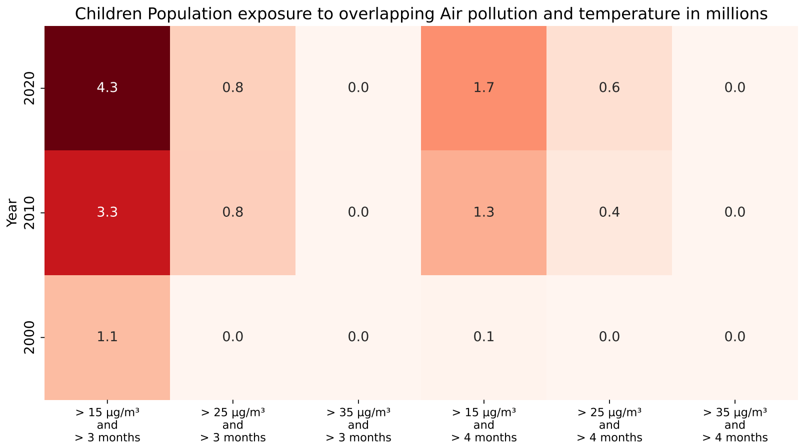
Figure 3.3



PM2.5 Interim Targets



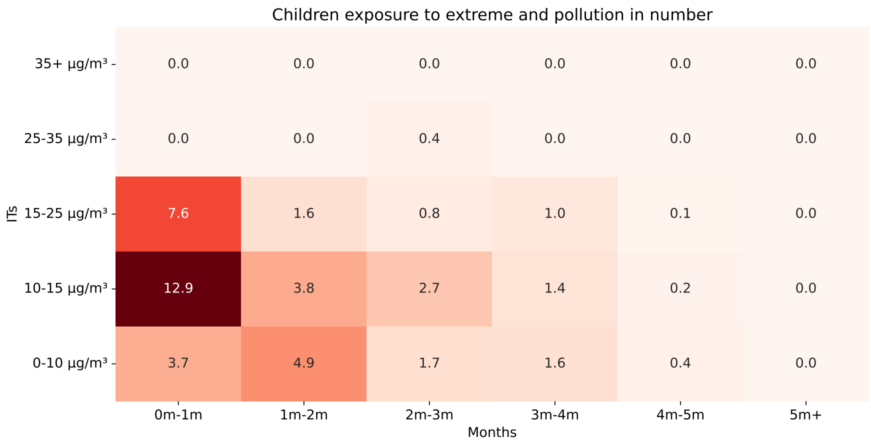
Months above 32 °



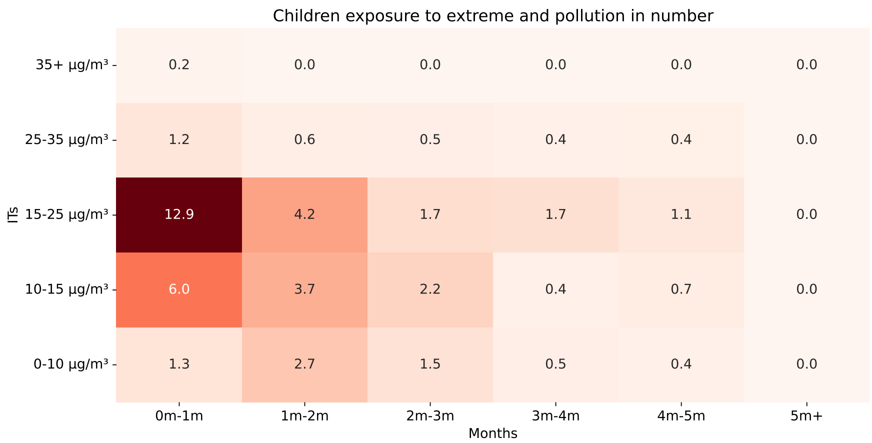
Combined Thresholds

Notes: These heat maps shows the number of children in millions exposed to different pollution and temperature threshold in 2000, 2010, and 2020.

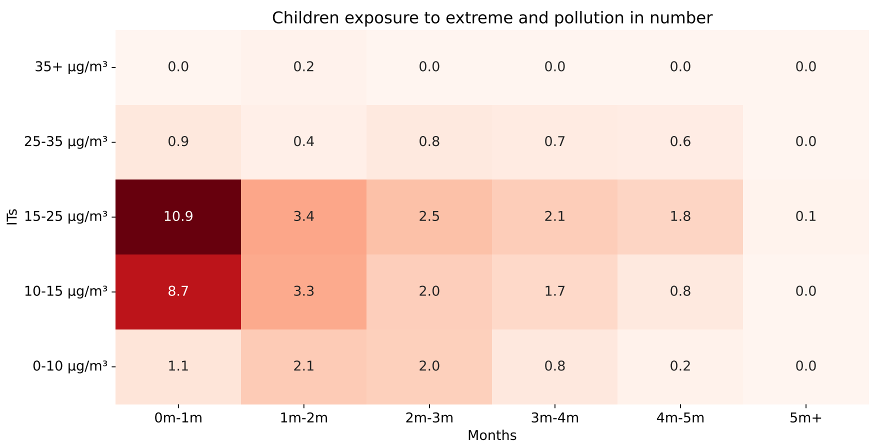
Figure 3.4



2000



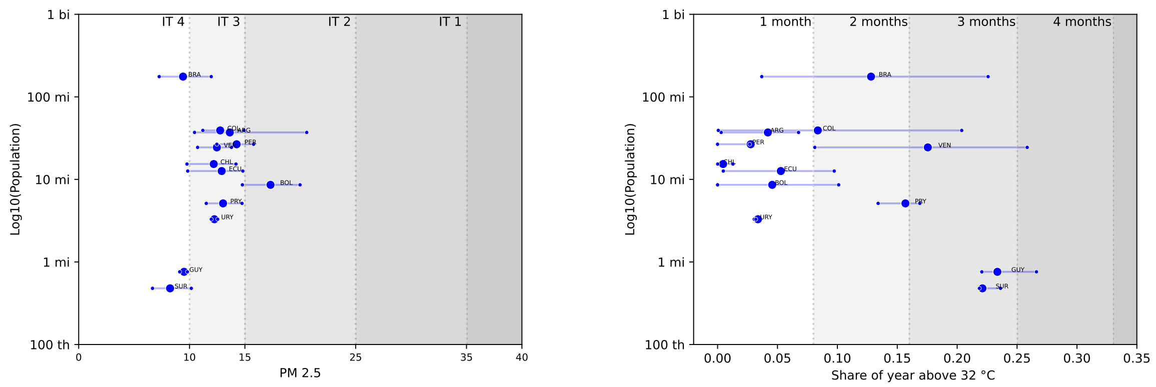
2010



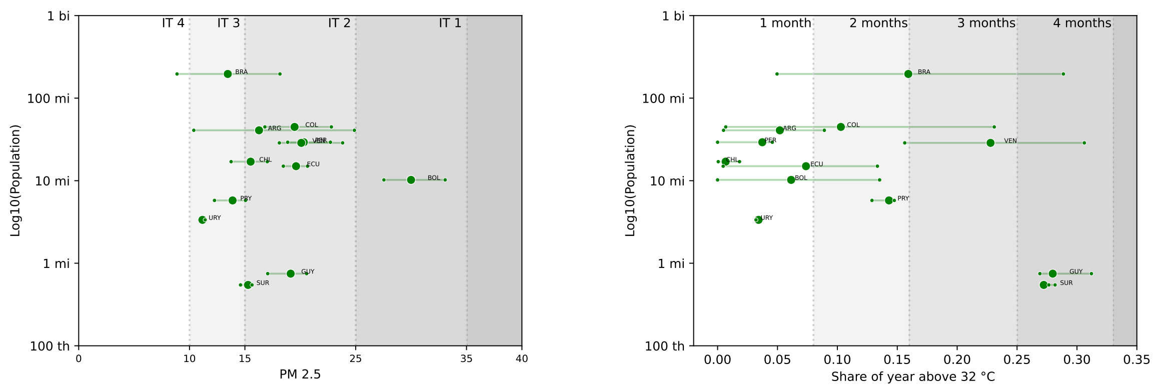
2020

Notes: These heat maps shows the number of children in millions exposed to both pollution and temperature threshold in 2000, 2010, and 2020.

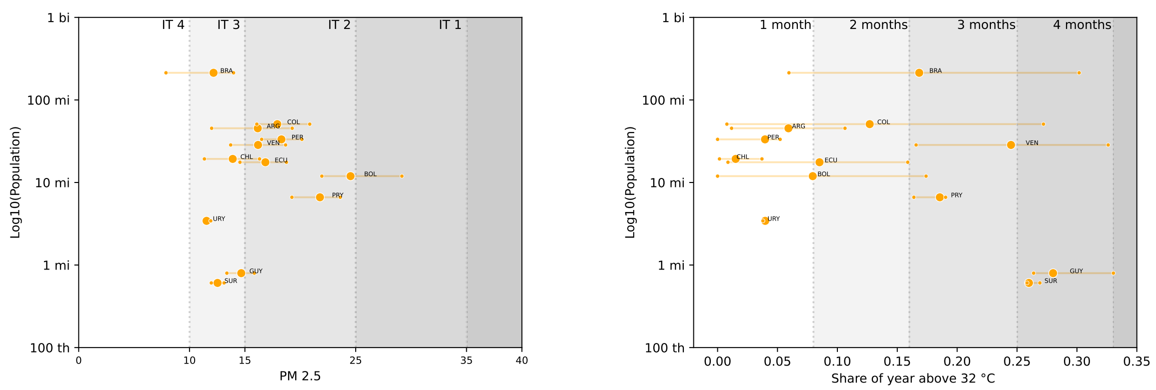
Figure 3.5: Country-specific distributional ranges. P20 (left-dot), mean (center-dot), P80 (right-dot)



2000



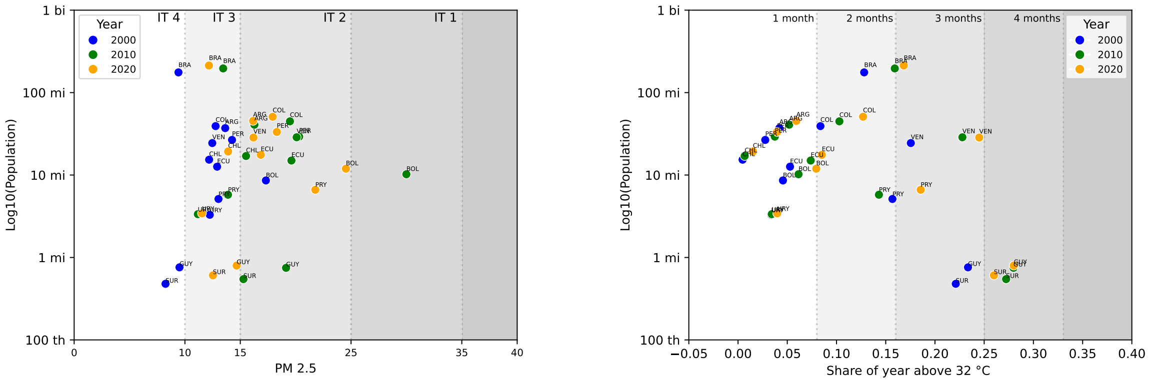
2010



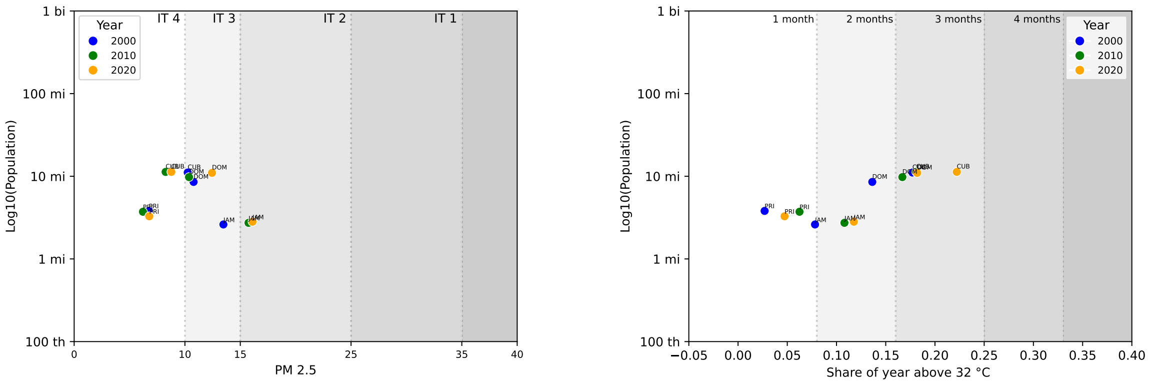
2020

Notes: Lines mark the 20th percentile, mean, and the 80th percentile of a country's $PM_{2.5}$. distribution and share of time above 32 ° , computed based on the distribution of $PM_{2.5}$ levels, time above 32 ° and population across cells corresponding to each country. The x-axis corresponds to levels of $PM_{2.5}$ levels. The vertical dashed lines corresponding to $PM_{2.5}$ thresholds in /m3 units according to WHO interim targets (ITs) and number of months of extreme heat. Background color corresponds to the IT and month ranges, with darker colors indicating lower air quality thresholds and more time of exposure.

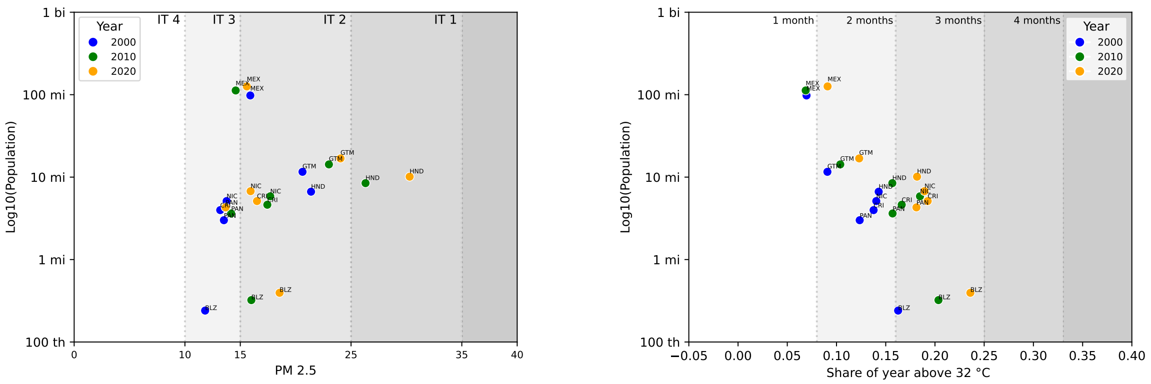
Figure 3.6: $PM_{2.5}$ and Share of year above 32 °C Country-specific means by subregion



South America



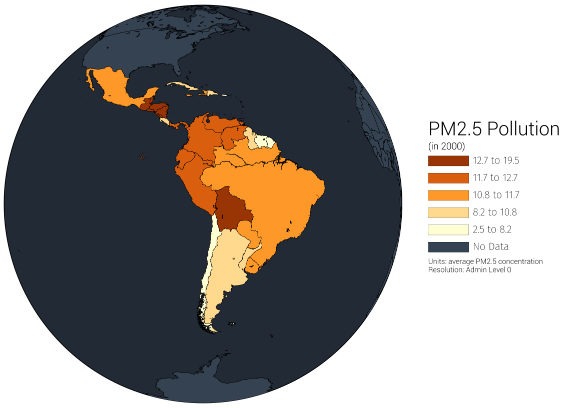
Caribbean



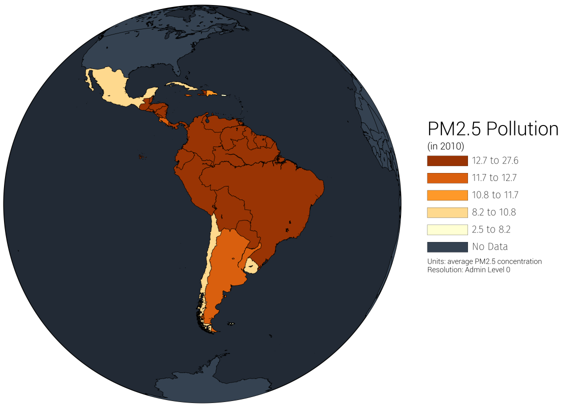
Central America

Notes: Mean country's $PM_{2.5}$ levels and share of year above 32 ° are plotted by subregion. These measures are computed based on the distribution of $PM_{2.5}$ levels, share of time above 32 ° and population across cells corresponding to each country. The x-axis corresponds to levels of $PM_{2.5}$ levels. The vertical dashed lines corresponding to $PM_{2.5}$ thresholds in /m3 units according to WHO interim targets (ITs) and number of months of extreme heat. Background color corresponds to the IT and month ranges, with darker colors indicating lower air quality thresholds and more time of exposure.

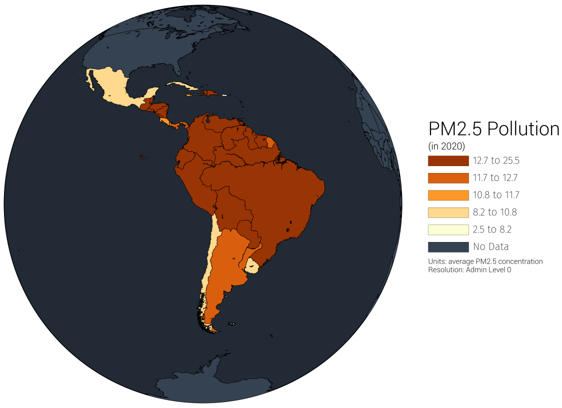
Figure 3.7: Country-level $PM_{2.5}$ levels categories



(a) 2000



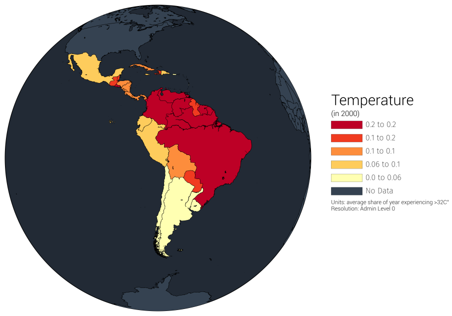
(b) 2010



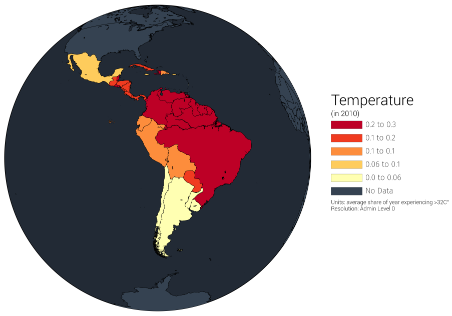
(c) 2020

Notes: These maps display country-level air pollution level aggregated to the country level obtained by overlapping Worldpop data on population and Van Donkelaar et al. (2021) dataset on $PM_{2.5}$ for years 2000, 2010, and 2020. Lighter colors indicate countries with smaller air pollution levels and darker colors indicates more air pollution. Black is used to indicate missing on country-level air pollution information.

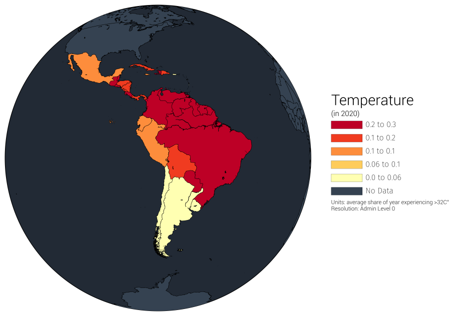
Figure 3.8: Country-level share of time > 32°



(a) 2000



(b) 2010



(c) 2020

Notes: These maps display country-level share of year above 32 ° obtained by overlapping Worldpop data on population and UTCI dataset for years 2000, 2010, and 2020. Lighter colors indicate countries with less time above 32 ° and darker colors indicates more time above this temperature. Black is used to indicate missing on country-level temperature information.

Table 3.1: Mean PM 2.5 and time above temperature thresholds by Admin 1

Region	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
Latin America and the Caribbean	2000	13.05	0.28	0.10	0.01
Latin America and the Caribbean	2010	16.44	0.31	0.11	0.01
Latin America and the Caribbean	2020	15.96	0.34	0.13	0.02
Caribbean	2000	10.69	0.46	0.14	0.01
Caribbean	2010	10.10	0.52	0.17	0.01
Caribbean	2020	11.94	0.56	0.18	0.01
Central America	2000	16.91	0.28	0.09	0.01
Central America	2010	17.01	0.29	0.09	0.01
Central America	2020	18.10	0.32	0.11	0.01
South America	2000	11.49	0.28	0.10	0.01
South America	2010	16.48	0.32	0.12	0.01
South America	2020	15.16	0.33	0.13	0.02

Note: This table show the number of children exposed to different pollution thresholds in each subregion in Latin America and the Caribbean. We obtain it by overlapping cell-level $PM_{2.5}$ levels and child population data and categorizing each cell according to the World Health Organization Interim Targets. Who Guideline corresponds to $PM_{2.5}$ levels $< 10\mu g/m^3$, WHO IT4 to $10 - 15\mu g/m^3$, WHO IT3 to $15 - 25\mu g/m^3$, WHO IT2 to $25 - 35\mu g/m^3$, and WHO IT1 to $35 + \mu g/m^3$. We show these numbers for 2000, 2010, and 2020

Table 3.2: Number of children exposure to PM 2.5 interim targets in millions by subregion

Region	Year	WHO Guideline	WHO IT4	WHO IT3	WHO IT2	WHO IT1
Latin America and the Caribbean	2000	12.28	21.09	11.16	0.45	0.00
Latin America and the Caribbean	2010	6.43	12.97	21.58	3.09	0.18
Latin America and the Caribbean	2020	6.26	16.44	20.74	3.27	0.21
Caribbean	2000	0.49	0.99	0.00	0.00	0.00
Caribbean	2010	0.78	0.61	0.03	0.00	0.00
Caribbean	2020	0.66	0.36	0.63	0.00	0.00
Central America	2000	1.18	4.10	7.44	0.45	0.00
Central America	2010	1.57	3.73	6.65	1.44	0.00
Central America	2020	1.36	4.42	6.49	2.18	0.21
South America	2000	10.61	16.00	3.72	0.00	0.00
South America	2010	4.07	8.63	14.90	1.65	0.18
South America	2020	4.25	11.67	13.62	1.09	0.00

Note: This table shows the number of children exposed to different pollution thresholds in each subregion in Latin America and the Caribbean. We obtain it by overlapping cell-level $PM_{2.5}$ levels and child population data and categorizing each cell according to the World Health Organization Interim Targets. Who Guideline corresponds to $PM_{2.5}$ levels $< 10\mu g/m^3$, WHO IT4 to $10 - 15\mu g/m^3$, WHO IT3 to $15 - 25\mu g/m^3$, WHO IT2 to $25 - 35\mu g/m^3$, and WHO IT1 to $35 + \mu g/m^3$. We show these numbers for 2000, 2010, and 2020

Table 3.3: Share of children exposed to PM 2.5 interim targets by subregion

Region	Year	WHO Guideline	WHO IT-4	WHO IT-3	WHO IT-2	WHO IT-1
Latin America and the Caribbean	2000	27.30	46.89	24.81	1.00	0.00
Latin America and the Caribbean	2010	14.53	29.30	48.76	6.99	0.41
Latin America and the Caribbean	2020	13.35	35.04	44.21	6.97	0.44
Caribbean	2000	32.95	67.05	0.00	0.00	0.00
Caribbean	2010	54.90	42.70	2.40	0.00	0.00
Caribbean	2020	39.88	21.66	38.46	0.00	0.00
Central America	2000	8.99	31.11	56.49	3.41	0.00
Central America	2010	11.76	27.83	49.65	10.76	0.00
Central America	2020	9.27	30.18	44.28	14.87	1.40
South America	2000	34.98	52.76	12.26	0.00	0.00
South America	2010	13.84	29.32	50.61	5.62	0.62
South America	2020	13.87	38.08	44.48	3.57	0.00

Note: This table shows the share of children exposed to different pollution thresholds in each subregion in Latin America and the Caribbean. We obtain it by overlapping cell-level $PM_{2.5}$ levels and child population data and categorizing each cell according to the World Health Organization Interim Targets. Who Guideline corresponds to $PM_{2.5}$ levels $< 10\mu g/m^3$, WHO IT4 to $10 - 15\mu g/m^3$, WHO IT3 to $15 - 25\mu g/m^3$, WHO IT2 to $25 - 35\mu g/m^3$, and WHO IT1 to $35 + \mu g/m^3$. We show these numbers for 2000, 2010, and 2020

Table 3.4: Number of children exposed to temperature > 32 ° in millions

Region	Year	0-1 months	1-2 months	2-3 months	3-4 months	4-5 months	5+ months
Latin America and the Caribbean	2000	24.63	10.40	5.95	3.54	0.47	0.00
Latin America and the Caribbean	2010	21.92	11.38	5.72	3.22	2.02	0.00
Latin America and the Caribbean	2020	21.69	10.49	7.21	5.03	2.50	0.00
Caribbean	2000	0.25	0.60	0.63	0.00	0.00	0.00
Caribbean	2010	0.02	0.80	0.61	0.00	0.00	0.00
Caribbean	2020	0.02	0.85	0.68	0.11	0.00	0.00
Central America	2000	8.07	2.36	2.23	0.52	0.00	0.00
Central America	2010	7.55	3.24	2.20	0.40	0.00	0.00
Central America	2020	7.76	2.82	2.41	1.48	0.17	0.00
South America	2000	16.31	7.45	3.09	3.01	0.47	0.00
South America	2010	14.35	7.34	2.91	2.82	2.02	0.00
South America	2020	13.92	6.82	4.12	3.45	2.32	0.00

Note: This table show the number of children exposed to different temperature thresholds in each subregion in Latin America and the Caribbean. We obtain it by overlapping cell-level UTCI and child population data and categorizing each cell according to the the corresponding time in months. We show these numbers for 2000, 2010, and 2020

Table 3.5: Share of children exposed to temperature > 32 ° by subregion

Region	Year	0-1 months	1-2 months	2-3 months	3-4 months	4-5 months	5+ months
Latin America and the Caribbean	2000	54.75	23.12	13.22	7.87	1.04	0.00
Latin America and the Caribbean	2010	49.53	25.71	12.92	7.28	4.56	0.00
Latin America and the Caribbean	2020	46.23	22.35	15.37	10.72	5.32	0.00
Caribbean	2000	17.02	40.24	42.74	0.00	0.00	0.00
Caribbean	2010	1.47	55.69	42.84	0.00	0.00	0.00
Caribbean	2020	1.02	51.37	41.21	6.40	0.00	0.00
Central America	2000	61.24	17.90	16.89	3.98	0.00	0.00
Central America	2010	56.38	24.21	16.41	2.99	0.00	0.00
Central America	2020	52.99	19.24	16.46	10.12	1.19	0.00
South America	2000	53.77	24.56	10.19	9.94	1.54	0.00
South America	2010	48.74	24.94	9.88	9.58	6.85	0.00
South America	2020	45.43	22.27	13.46	11.25	7.59	0.00

Note: This table show the share of children exposed to different temperature thresholds in each subregion in Latin America and the Caribbean. We obtain it by overlapping cell-level UTCI and child population data and categorizing each cell according to the the corresponding time in months. We show these numbers for 2000, 2010, and 2020

Table 3.6: Number of children exposed to combined air pollution and temperature thresholds by region

Region	Year	> IT3 & > 3 months	> IT3 & > 4 month	> IT2 & > 3 month	> IT2 & > 4
Latin America and the Caribbean	2000	1.08	0.06	0.00	
Latin America and the Caribbean	2010	3.31	1.26	0.80	
Latin America and the Caribbean	2020	4.33	1.66	0.78	
Caribbean	2000	0.00	0.00	0.00	
Caribbean	2010	0.00	0.00	0.00	
Caribbean	2020	0.00	0.00	0.00	
Central America	2000	0.41	0.00	0.00	
Central America	2010	0.21	0.00	0.18	
Central America	2020	1.14	0.17	0.30	
South America	2000	0.67	0.06	0.00	
South America	2010	3.10	1.26	0.62	
South America	2020	3.19	1.49	0.48	

Note: This table show the number of children exposed to different combinations of air pollution and temperature thresholds in each subregion in Latin America and the Caribbean. We obtain it by overlapping cell-level air pollution, UTCI and child population data and categorizing each cell according to the the corresponding time in months. We show these numbers for 2000, 2010, and 2020

Table 3.7: Share of children exposed to combined thresholds by region

Region	Year	> IT3 & > 3 months	> IT3 & > 4 month	> IT2 & > 3 month	> IT2 & > 4
Latin America and the Caribbean	2000	2.40	0.13	0.00	
Latin America and the Caribbean	2010	7.48	2.86	1.81	
Latin America and the Caribbean	2020	9.22	3.55	1.66	
Caribbean	2000	0.00	0.00	0.00	
Caribbean	2010	0.00	0.00	0.00	
Caribbean	2020	0.00	0.00	0.00	
Central America	2000	3.11	0.00	0.00	
Central America	2010	1.55	0.00	1.32	
Central America	2020	7.78	1.19	2.04	
South America	2000	2.21	0.20	0.00	
South America	2010	10.54	4.29	2.12	
South America	2020	10.40	4.86	1.57	

Note: This table show the share of children exposed to different combinations of air pollution and temperature thresholds in each subregion in Latin America and the Caribbean. We obtain it by overlapping cell-level air pollution, UTCI and child population data and categorizing each cell according to the the corresponding time in months. We show these numbers for 2000, 2010, and 2020

Tables and Figures (Existing data)

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ONLINE APPENDIX

Extreme-Heat and Air-Pollution Risks for Early Childhood Development in Latin America and the Caribbean

Angelo dos Santos, Alexandre Bagolle, Jere R. Behrman, Florencia Lopez Boo,

Emily Hannum, Joaquín Paseyro Mayol, Oscar Morales, Fan Wang

A Data Appendix (online)

This is the data appendix. Here is a footnote.[A.1]

Below we include a markdown file. This markdown file is copied over from a github issue.

In dataset with hh $\times$ loan as observation, file: `tstm_loans_startend_paired`.

We construct loan relationships, analyze loan connection type, connection named based on main, not paired loan. Note that the file below is not sufficient for tabulation, because it only includes connected loans:

1. Sort by hh, and loan start times
2. Generate is top-hook, and corresponding bottom.
    - Step two finds top and bottom hook jointly, the main is always candidate for top.
3. Keep only cases where hooks are established
4. Compute distances: GL, GM, GR
    - GL: top left - bottom left
    - GM: bottom left - top right
    - GR: top right - bottom right
5. Merge in loan lender categories of top and bottom

A.1. This is a footnote. Which is re-indexed for the appendix.

B Additional Estimation (online)

This is the additional estimation appendix. Here is a footnote.[B.1]

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

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And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

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B.1. This is a footnote. Which is re-indexed for the appendix.

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C Solution, Identification and Estimation of the Model (online)

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha)+\cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special content, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

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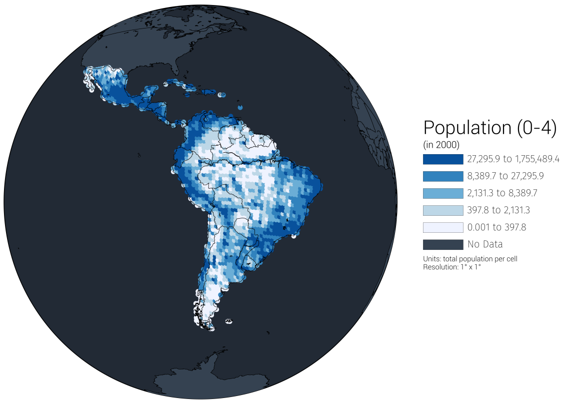
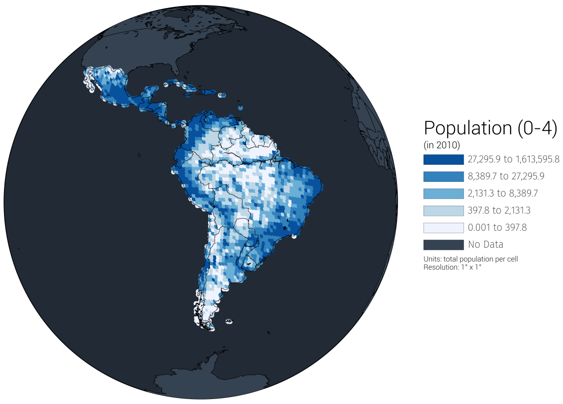
D Additional Figures and Tables (online)

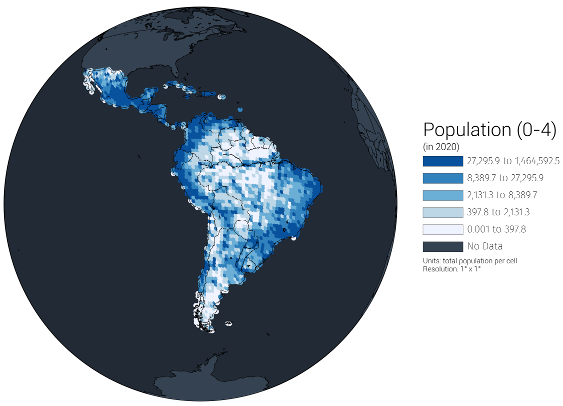
Figure D.1: Cell-level population estimates over $1^\circ \times 1^\circ$ longitude–latitude grids



(a) 2000



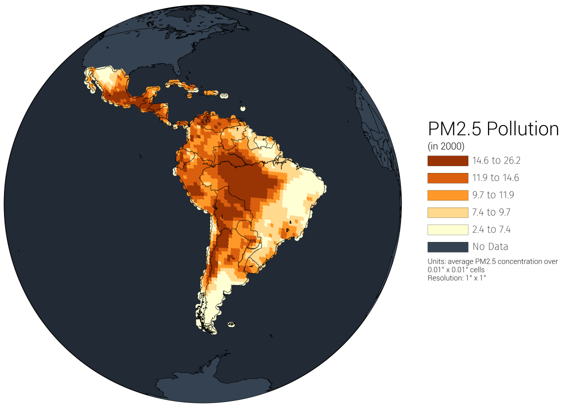
(b) 2010



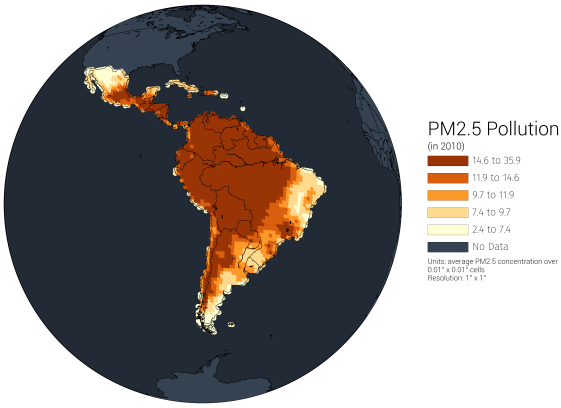
(c) 2020

Notes: These maps display cell-level population estimates in $1^o \times 1^o$ resolution using Worldpop data for years 2000, 2005, 2010, 2015, and 2020. Lighter colors indicate less populated cells and darker colors indicates more populated cells. Black is used to indicate missing on cell-level population estimates, cell country label, and boundaries belonging to regions or countries outside LAC.

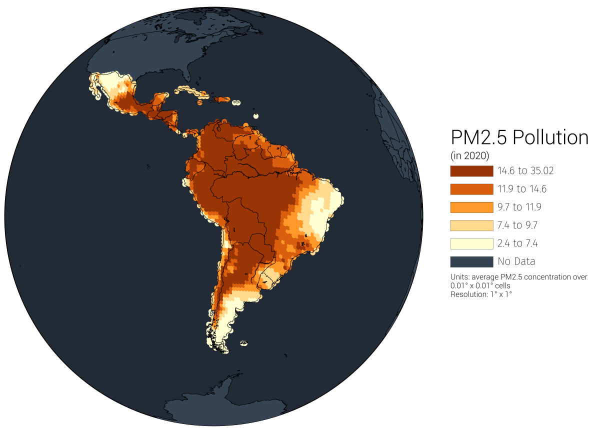
Figure D.2: Cell-level $PM_{2.5}$ level over $1° \times 1°$ longitude–latitude grids



(a) 2000



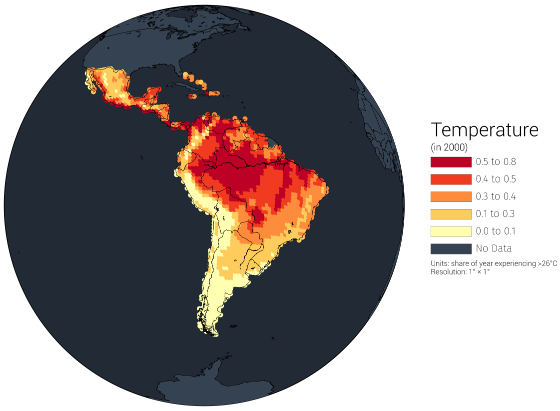
(b) 2010



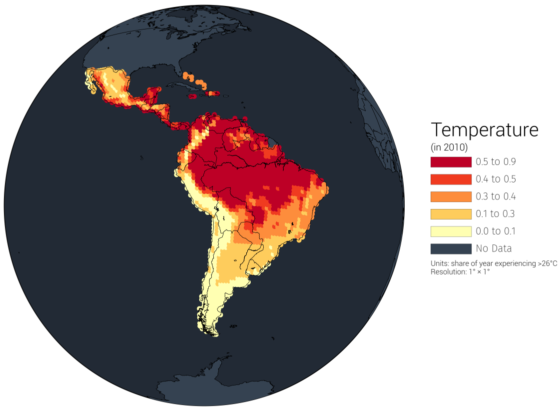
(c) 2020

Notes: These maps display cell-level $PM_{2.5}$ levels in $1^o \times 1^o$ resolution using Van Donkelaar et al. (2021) dataset for years 2000, 2005, 2010, 2015, and 2020. Lighter colors indicate lower levels of air pollution levels and darker colors indicates more higher levels of pollution. Black is used to indicate missing on cell-level air pollution level, cell country label, and boundaries belonging to regions or countries outside LAC.

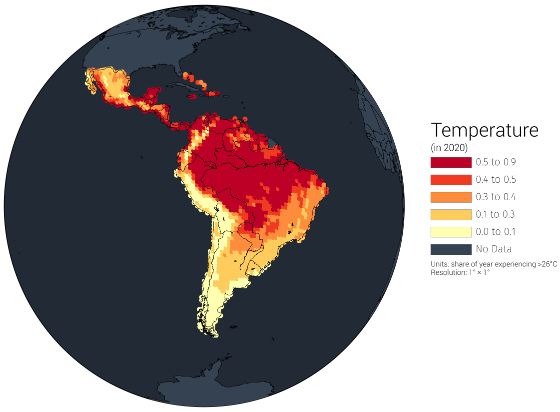
Figure D.3: Cell-level share of time temperature was in excess of UTCI 26 over 1° × 1° longitude–latitude grids



(a) 2000



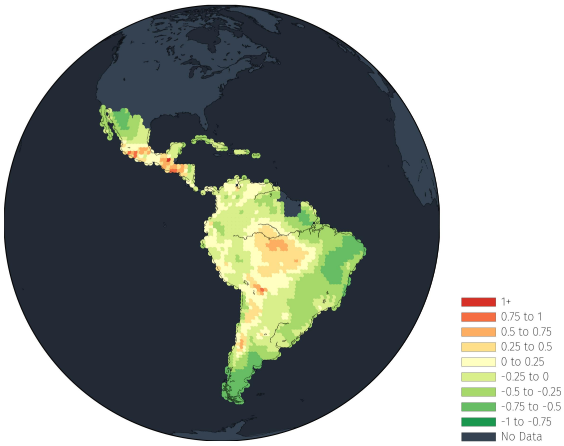
(b) 2010



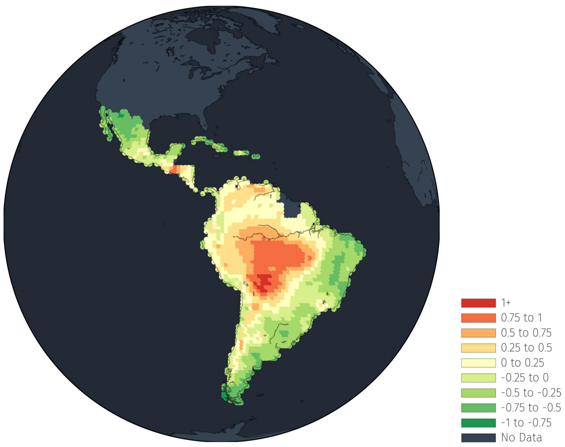
(c) 2020

Notes: These maps display cell-level share of time temperature was in excess of UTCI 26 in $1^o \times 1^o$ resolution using UTCI dataset from ERA5 for years 2000, 2005, 2010, 2015, and 2020. Lighter colors indicate cell with smaller share of time temperature was in excess of UTCI 26 in a particular year and darker colors indicates more share of time above the same threshold. Black is used to indicate missing on cell-level time temperature was in excess of UTCI 26, cell country label, and boundaries belonging to regions or countries outside LAC.

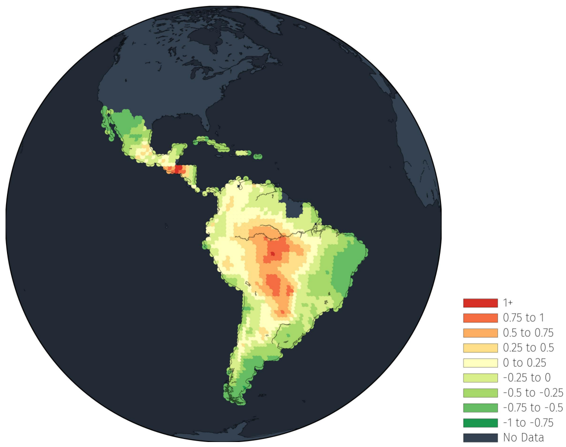
Figure D.4: Cell-level excess burden over $1^\circ \times 1^\circ$ longitude–latitude grids



(a) 2000



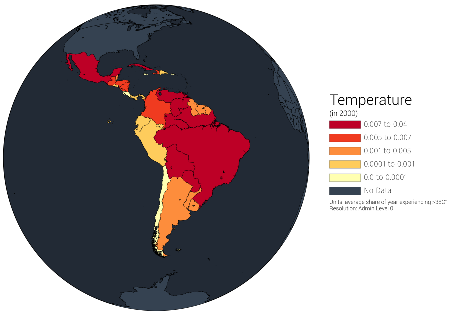
(b) 2010



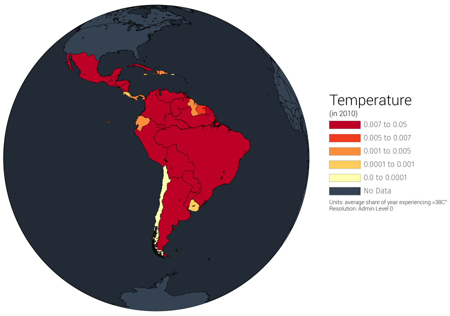
(c) 2020

Notes: These maps display cell-level air pollution burden in $1^o \times 1^o$ resolution obtained by overlapping Worldpop data on population and Van Donkelaar et al. (2021) dataset on $PM_{2.5}$ for years 2000, 2005, 2010, 2015, and 2020. Lighter colors indicate cells with smaller air pollution burden and darker colors indicates cells with more air pollution burden. Black is used to indicate missing on cell-level air pollution burden estimates, cell country label, and boundaries belonging to regions or countries outside LAC.

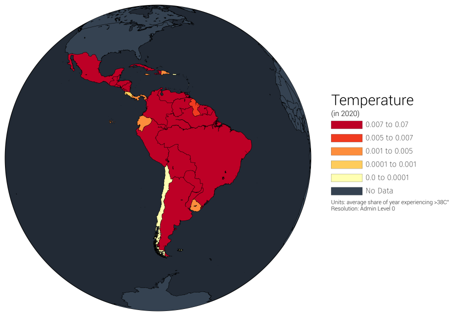
Figure D.5: Country-level share of time > 38°



(a) 2000



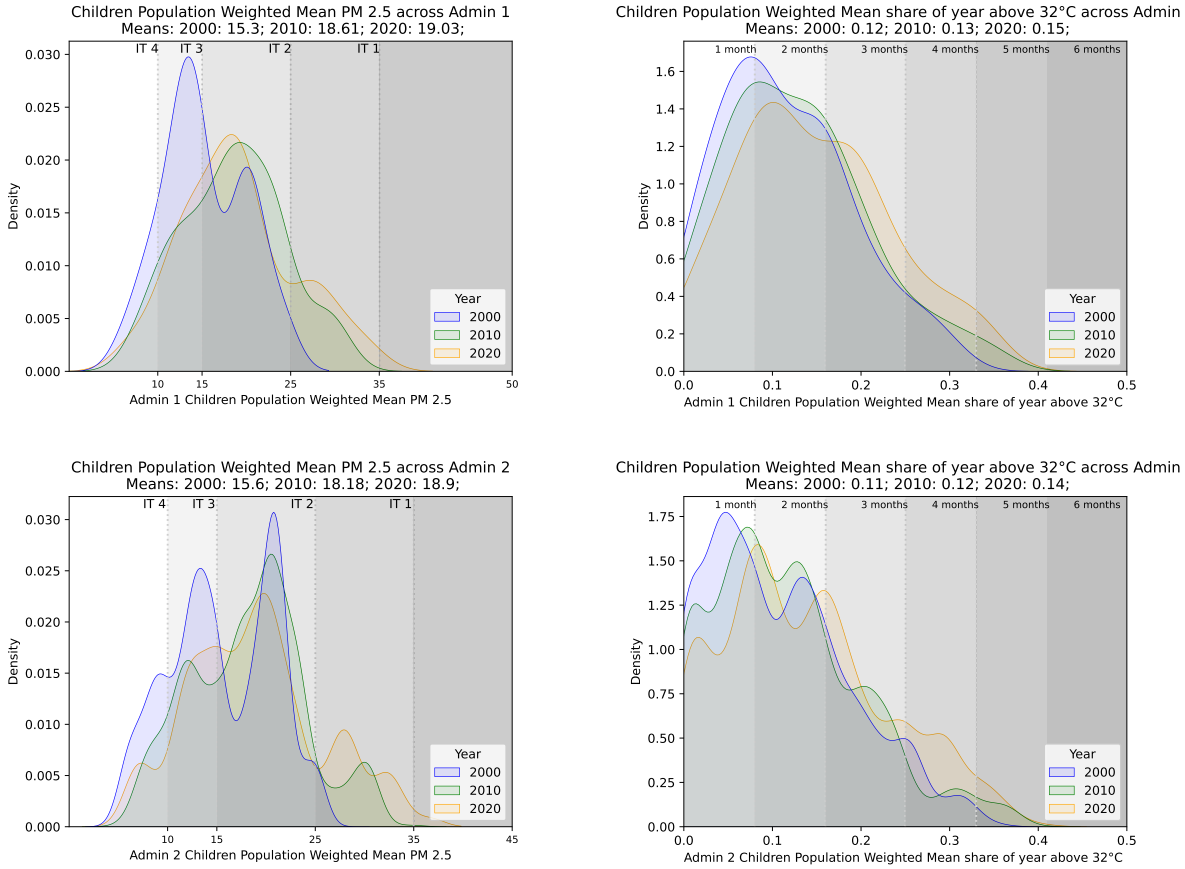
(b) 2010



(c) 2020

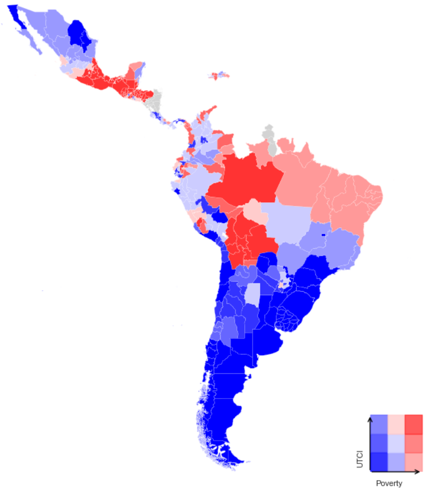
Notes: These maps display country-level share of year above 38 ° obtained by overlapping Worldpop data on population and UTCI dataset for years 2000, 2010, and 2020. Lighter colors indicate countries with less time above 38 ° and darker colors indicates more time above this temperature. Black is used to indicate missing on country-level temperature information.

Figure D.6

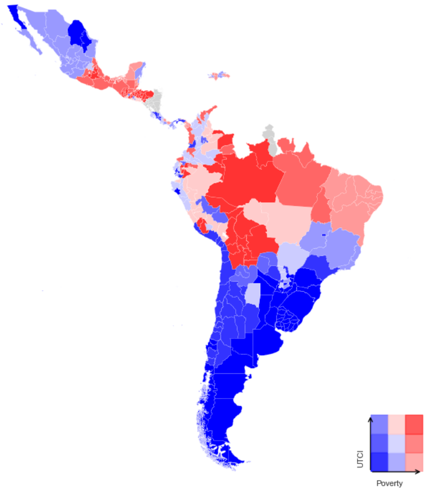


Notes: Distribution of Admin level 1 and Admin level PM 2.5 levels, share of time above 32 °, and above 38 ° for 2000, 2010 and 2020. Distributions are weighted by its cell-level population information. Background colors indicate severity ranges and vertical lines indicates severity thresholds.

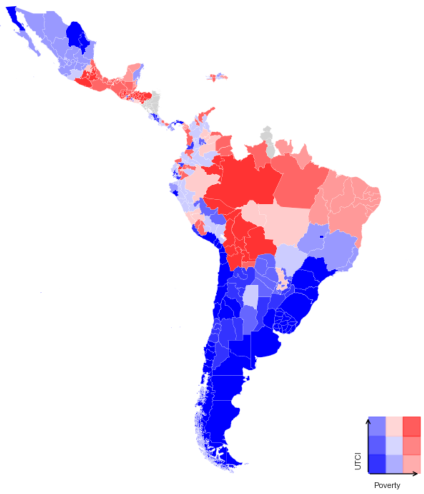
Figure D.7: Bivariate map for Poverty-UTCI mean tercile groups



(a) 2000



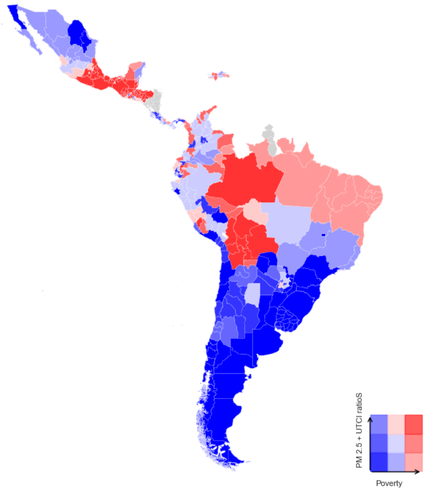
(b) 2010



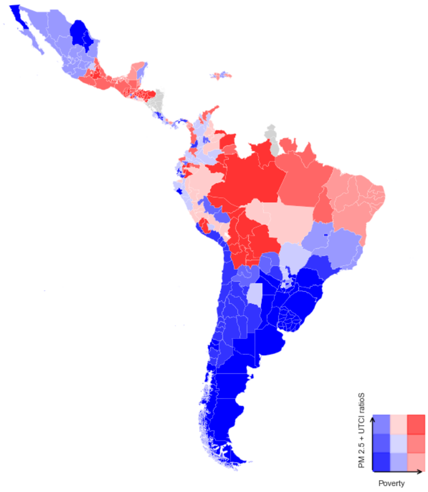
(c) 2020

Notes:

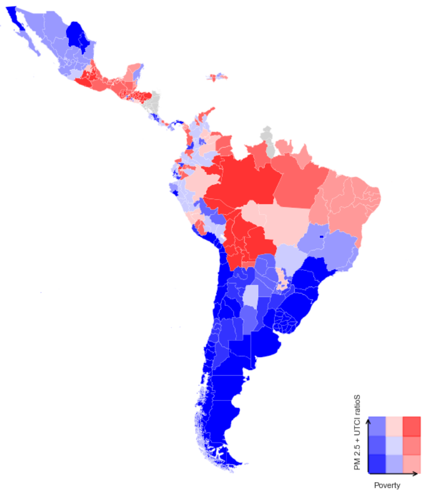
Figure D.8: Bivariate map for Poverty-Overall exposure inequality tercile groups



(a) 2000



(b) 2010



(c) 2020

Notes:

E Regions

Table E.1: Number of children exposed to temperature $> 38\ ^\circ$ in millions

Region	Year	0-1 months	1-2 months	2-3 months	3-4 months	4-5 months	5+ months
Latin America and the Caribbean	2000	44.96	0.02	0.00	0.00	0.00	0.00
Latin America and the Caribbean	2010	43.75	0.51	0.00	0.00	0.00	0.00
Latin America and the Caribbean	2020	45.64	1.28	0.00	0.00	0.00	0.00
Caribbean	2000	1.48	0.00	0.00	0.00	0.00	0.00
Caribbean	2010	1.43	0.00	0.00	0.00	0.00	0.00
Caribbean	2020	1.65	0.00	0.00	0.00	0.00	0.00
Central America	2000	13.15	0.02	0.00	0.00	0.00	0.00
Central America	2010	13.36	0.03	0.00	0.00	0.00	0.00
Central America	2020	14.44	0.20	0.00	0.00	0.00	0.00
South America	2000	30.33	0.00	0.00	0.00	0.00	0.00
South America	2010	28.96	0.48	0.00	0.00	0.00	0.00
South America	2020	29.55	1.08	0.00	0.00	0.00	0.00

Table E.2: Number of children exposed to temperature $> 38\ ^\circ$ in millions

Region	Year	0-1 months	1-2 months	2-3 months	3-4 months	4-5 months	5+ months
Latin America and the Caribbean	2000	99.95	0.05	0.00	0.00	0.00	0.00
Latin America and the Caribbean	2010	98.85	1.15	0.00	0.00	0.00	0.00
Latin America and the Caribbean	2020	97.27	2.73	0.00	0.00	0.00	0.00
Caribbean	2000	100.00	0.00	0.00	0.00	0.00	0.00
Caribbean	2010	100.00	0.00	0.00	0.00	0.00	0.00
Caribbean	2020	100.00	0.00	0.00	0.00	0.00	0.00
Central America	2000	99.82	0.18	0.00	0.00	0.00	0.00
Central America	2010	99.80	0.20	0.00	0.00	0.00	0.00
Central America	2020	98.60	1.40	0.00	0.00	0.00	0.00
South America	2000	100.00	0.00	0.00	0.00	0.00	0.00
South America	2010	98.36	1.64	0.00	0.00	0.00	0.00
South America	2020	96.48	3.52	0.00	0.00	0.00	0.00

F Country

Table F.1: Mean PM 2.5 and time above temperature thresholds by country

Country	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
ARG	2000	13.64	0.14	0.04	0.00
ARG	2010	16.27	0.15	0.05	0.01
ARG	2020	16.16	0.17	0.06	0.01
BLZ	2000	11.82	0.43	0.16	0.00
BLZ	2010	16.00	0.50	0.20	0.02
BLZ	2020	18.55	0.51	0.24	0.03
BOL	2000	17.31	0.14	0.05	0.00
BOL	2010	30.00	0.17	0.06	0.01
BOL	2020	24.53	0.20	0.08	0.01
BRA	2000	9.42	0.34	0.13	0.01
BRA	2010	13.45	0.39	0.16	0.02
BRA	2020	12.17	0.41	0.17	0.02
CHL	2000	12.19	0.08	0.00	0.00
CHL	2010	15.52	0.08	0.01	0.00
CHL	2020	13.90	0.11	0.02	0.00
COL	2000	12.77	0.28	0.08	0.01
COL	2010	19.48	0.34	0.10	0.01
COL	2020	17.92	0.38	0.13	0.02
CRI	2000	13.19	0.62	0.14	0.00
CRI	2010	17.44	0.63	0.17	0.00
CRI	2020	16.51	0.69	0.19	0.00
CUB	2000	10.25	0.45	0.18	0.02
CUB	2010	8.26	0.48	0.18	0.02
CUB	2020	8.77	0.55	0.22	0.03
DOM	2000	10.78	0.46	0.14	0.00
DOM	2010	10.37	0.53	0.17	0.00
DOM	2020	12.44	0.56	0.18	0.01
ECU	2000	12.91	0.22	0.05	0.00
ECU	2010	19.62	0.27	0.07	0.00
ECU	2020	16.85	0.28	0.09	0.00
FLK	2000	2.71	0.00	0.00	0.00
FLK	2010	3.66	0.00	0.00	0.00
FLK	2020	3.89	0.00	0.00	0.00
GTM	2000	20.62	0.30	0.09	0.00
GTM	2010	23.00	0.33	0.10	0.01
GTM	2020	24.05	0.36	0.12	0.01
GUF	2000	10.38	0.45	0.21	0.00
GUF	2010	13.63	0.55	0.26	0.01
GUF	2020	12.17	0.52	0.24	0.01
GUY	2000	9.51	0.50	0.23	0.01
GUY	2010	19.13	0.60	0.28	0.02
GUY	2020	14.67	0.59	0.28	0.02
HND	2000	21.39	0.40	0.14	0.01
HND	2010	26.31	0.42	0.16	0.01
HND	2020	30.29	0.45	0.18	0.01
JAM	2000	13.47	0.45	0.08	0.00

Country	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
JAM	2010	15.74	0.55	0.11	0.00
JAM	2020	16.10	0.57	0.12	0.00
MEX	2000	15.90	0.24	0.07	0.01
MEX	2010	14.58	0.23	0.07	0.01
MEX	2020	15.59	0.28	0.09	0.01
MTQ	2000	6.04	0.34	0.01	0.00
MTQ	2010	6.90	0.51	0.04	0.00
MTQ	2020	6.44	0.46	0.04	0.00
NIC	2000	13.77	0.43	0.14	0.01
NIC	2010	17.70	0.52	0.18	0.02
NIC	2020	15.93	0.52	0.19	0.02
PAN	2000	13.52	0.51	0.12	0.00
PAN	2010	14.18	0.59	0.16	0.00
PAN	2020	13.67	0.63	0.18	0.00
PER	2000	14.25	0.12	0.03	0.00
PER	2010	20.32	0.15	0.04	0.00
PER	2020	18.30	0.16	0.04	0.00
PRI	2000	6.75	0.33	0.03	0.00
PRI	2010	6.21	0.47	0.06	0.00
PRI	2020	6.78	0.44	0.05	0.00
PRY	2000	13.03	0.32	0.16	0.03
PRY	2010	13.89	0.32	0.14	0.03
PRY	2020	21.77	0.37	0.19	0.04
SUR	2000	8.25	0.47	0.22	0.00
SUR	2010	15.28	0.57	0.27	0.01
SUR	2020	12.53	0.55	0.26	0.01
URY	2000	12.24	0.12	0.03	0.00
URY	2010	11.17	0.13	0.03	0.00
URY	2020	11.54	0.14	0.04	0.00
USA	2000	0.00	0.00	0.00	0.00
USA	2010	0.00	0.00	0.00	0.00
USA	2020	0.00	0.00	0.00	0.00
VEN	2000	12.47	0.45	0.18	0.02
VEN	2010	20.09	0.56	0.23	0.03
VEN	2020	16.18	0.55	0.24	0.05

Note: This table show population weighted mean for countries in Latin America and the Caribbean. We show means for air pollution and temperature exposure for 2000, 2010 and 2020.

Table F.2: Number of children exposure to PM 2.5 interim targets in thousands by country

Country	Year	WHO Guideline	WHO IT-4	WHO IT-3	WHO IT-2	WHO IT-1
ARG	2000	463.13	1276.28	859.99	0.00	0.00
ARG	2010	451.51	738.06	1384.37	39.92	0.00
ARG	2020	302.47	721.04	1732.51	6.28	0.00
BLZ	2000	0.00	122.53	0.00	0.00	0.00
BLZ	2010	0.00	47.73	84.67	0.00	0.00
BLZ	2020	0.00	58.95	94.61	0.00	0.00
BOL	2000	0.00	284.76	956.53	0.00	0.00
BOL	2010	0.00	0.00	216.26	873.99	181.71
BOL	2020	0.00	47.21	663.50	660.87	0.00
BRA	2000	8889.33	5168.84	538.03	0.00	0.00
BRA	2010	3529.20	5610.68	3452.99	514.64	0.00
BRA	2020	3691.13	7246.86	1603.29	401.19	0.00
CHL	2000	130.03	332.82	96.66	0.00	0.00
CHL	2010	8.79	225.06	294.91	0.00	0.00
CHL	2020	36.22	270.39	272.47	0.00	0.00
COL	2000	409.74	3017.76	93.20	0.00	0.00
COL	2010	0.00	85.39	3664.38	0.47	0.00
COL	2020	0.00	634.75	3544.21	0.00	0.00
CRI	2000	0.00	139.08	0.00	0.00	0.00
CRI	2010	0.00	0.00	124.89	0.00	0.00
CRI	2020	0.00	0.00	116.04	0.00	0.00
CUB	2000	127.97	157.46	0.00	0.00	0.00
CUB	2010	232.40	0.00	0.00	0.00	0.00
CUB	2020	231.59	0.00	0.00	0.00	0.00
DOM	2000	334.76	791.63	0.00	0.00	0.00
DOM	2010	531.39	609.62	0.00	0.00	0.00
DOM	2020	408.99	356.98	600.62	0.00	0.00
ECU	2000	348.81	811.02	228.11	0.00	0.00
ECU	2010	0.00	0.68	1468.06	0.00	0.00
ECU	2020	0.00	334.57	1237.72	0.00	0.00
FLK	2000	0.00	0.00	0.00	0.00	0.00
FLK	2010	0.00	0.00	0.00	0.00	0.00
FLK	2020	0.00	0.00	0.00	0.00	0.00
GTM	2000	0.00	0.00	1574.74	39.75	0.00
GTM	2010	0.00	39.26	1037.12	608.03	0.00
GTM	2020	0.00	108.17	565.48	1196.09	0.00
GUF	2000	1.65	2.62	0.00	0.00	0.00
GUF	2010	0.00	5.26	0.24	0.00	0.00
GUF	2020	0.00	7.83	0.00	0.00	0.00
GUY	2000	45.00	5.00	0.00	0.00	0.00
GUY	2010	0.00	5.75	52.10	0.00	0.00
GUY	2020	0.00	27.15	53.06	0.00	0.00
HND	2000	24.14	5.80	1058.21	390.17	0.00
HND	2010	0.00	7.11	517.71	832.48	0.00
HND	2020	0.00	9.08	196.80	981.66	205.26
JAM	2000	0.00	42.72	0.00	0.00	0.00
JAM	2010	0.00	0.00	34.29	0.00	0.00
JAM	2020	0.00	0.00	33.39	0.00	0.00
MEX	2000	1101.20	3406.32	4564.65	18.77	0.00

Country	Year	WHO Guideline	WHO IT-4	WHO IT-3	WHO IT-2	WHO IT-1
MEX	2010	1574.02	3462.01	4322.97	0.00	0.00
MEX	2020	1357.54	3773.27	5244.57	0.00	0.00
MTQ	2000	12.45	0.00	0.00	0.00	0.00
MTQ	2010	9.72	0.00	0.00	0.00	0.00
MTQ	2020	8.49	0.00	0.00	0.00	0.00
NIC	2000	59.49	315.60	245.55	0.00	0.00
NIC	2010	0.00	93.50	518.46	0.00	0.00
NIC	2020	0.00	345.38	267.59	0.00	0.00
PAN	2000	0.00	110.11	0.00	0.00	0.00
PAN	2010	0.00	76.40	40.78	0.00	0.00
PAN	2020	0.00	124.53	0.00	0.00	0.00
PER	2000	2.55	1717.74	789.99	0.00	0.00
PER	2010	0.00	101.26	2419.14	58.14	0.00
PER	2020	13.32	297.81	2516.80	0.00	0.00
PRI	2000	12.26	0.00	0.00	0.00	0.00
PRI	2010	10.37	0.00	0.00	0.00	0.00
PRI	2020	8.36	0.00	0.00	0.00	0.00
PRY	2000	75.07	567.40	4.42	0.00	0.00
PRY	2010	0.00	304.30	300.34	0.00	0.00
PRY	2020	0.00	0.00	611.76	23.83	0.00
SUR	2000	2.67	2.02	0.00	0.00	0.00
SUR	2010	0.00	2.27	2.11	0.00	0.00
SUR	2020	0.00	4.58	0.00	0.00	0.00
URY	2000	37.13	1297.06	0.00	0.00	0.00
URY	2010	84.70	1399.34	0.00	0.00	0.00
URY	2020	83.45	1483.28	0.00	0.00	0.00
USA	2000	0.00	0.00	0.00	0.00	0.00
USA	2010	0.00	0.00	0.00	0.00	0.00
USA	2020	0.00	0.00	0.00	0.00	0.00
VEN	2000	202.59	1517.86	152.60	0.00	0.00
VEN	2010	0.00	156.64	1646.74	166.64	0.00
VEN	2020	122.38	590.29	1389.16	0.00	0.00

Note: This table show the number of children exposed to different pollution thresholds in each country in Latin America and the Caribbean. We obtain it by overlapping cell-level PM 2.5 levels and child population data and categorizing each cell according to the World Health Organization Interim Targets. Who Guideline corresponds to PM 2.5 levels $< 10\mu g/m^3$, WHO IT4 to $10 - 15\mu g/m^3$, WHO IT3 to $15 - 25\mu g/m^3$, WHO IT2 to $25 - 35\mu g/m^3$, and WHO IT1 to $35 + \mu g/m^3$. We show these numbers for 2000, 2010, and 2020

Table F.3: Number of children exposed to temperature $> 32\,^{\circ}$ in millions by country

Country	Year	0-1 months	1-2 months	2-3 months	3-4 months	4-5 months	5+ months
ARG	2000	2219.10	380.29	0.00	0.00	0.00	0.00
ARG	2010	2032.46	576.62	4.78	0.00	0.00	0.00
ARG	2020	1983.82	719.04	59.43	0.00	0.00	0.00
BLZ	2000	0.00	40.16	82.37	0.00	0.00	0.00
BLZ	2010	0.00	0.00	132.40	0.00	0.00	0.00
BLZ	2020	0.00	0.00	153.56	0.00	0.00	0.00
BOL	2000	893.64	260.40	53.74	33.52	0.00	0.00
BOL	2010	823.62	287.67	98.92	61.74	0.00	0.00
BOL	2020	855.72	62.56	332.74	108.99	11.58	0.00
BRA	2000	5156.82	5575.35	1462.22	2107.41	294.39	0.00
BRA	2010	3830.00	4588.24	1769.60	1299.55	1620.13	0.00
BRA	2020	3346.99	4196.38	2228.27	1546.39	1624.42	0.00
CHL	2000	559.51	0.00	0.00	0.00	0.00	0.00
CHL	2010	528.76	0.00	0.00	0.00	0.00	0.00
CHL	2020	579.08	0.00	0.00	0.00	0.00	0.00
COL	2000	2383.99	297.11	494.56	174.99	170.06	0.00
COL	2010	2284.51	417.95	390.03	462.70	195.05	0.00
COL	2020	2341.95	556.93	138.37	837.08	304.62	0.00
CRI	2000	0.00	139.08	0.00	0.00	0.00	0.00
CRI	2010	0.00	124.89	0.00	0.00	0.00	0.00
CRI	2020	0.00	0.00	116.04	0.00	0.00	0.00
CUB	2000	1.14	126.17	158.12	0.00	0.00	0.00
CUB	2010	0.86	103.09	128.45	0.00	0.00	0.00
CUB	2020	0.00	47.41	78.66	105.52	0.00	0.00
DOM	2000	183.24	469.08	474.07	0.00	0.00	0.00
DOM	2010	0.00	657.77	483.24	0.00	0.00	0.00
DOM	2020	0.00	765.97	600.62	0.00	0.00	0.00
ECU	2000	1084.26	303.22	0.47	0.00	0.00	0.00
ECU	2010	925.37	444.39	98.30	0.68	0.00	0.00
ECU	2020	594.27	723.49	253.63	0.91	0.00	0.00
FLK	2000	0.00	0.00	0.00	0.00	0.00	0.00
FLK	2010	0.00	0.00	0.00	0.00	0.00	0.00
FLK	2020	0.00	0.00	0.00	0.00	0.00	0.00
GTM	2000	911.75	569.29	23.91	109.54	0.00	0.00
GTM	2010	878.01	652.38	114.76	39.26	0.00	0.00
GTM	2020	944.27	56.97	692.70	175.79	0.00	0.00
GUF	2000	0.00	0.00	4.27	0.00	0.00	0.00
GUF	2010	0.00	0.00	1.82	3.68	0.00	0.00
GUF	2020	0.00	0.00	6.38	1.45	0.00	0.00
GUY	2000	2.48	2.60	14.26	30.66	0.00	0.00
GUY	2010	1.25	4.90	1.84	49.85	0.00	0.00
GUY	2020	3.26	9.08	1.86	21.14	44.87	0.00
HND	2000	720.84	24.14	521.82	211.51	0.00	0.00
HND	2010	215.34	514.29	451.34	176.33	0.00	0.00
HND	2020	0.00	731.06	487.14	0.00	174.60	0.00
JAM	2000	42.72	0.00	0.00	0.00	0.00	0.00
JAM	2010	0.00	34.29	0.00	0.00	0.00	0.00
JAM	2020	0.00	33.39	0.00	0.00	0.00	0.00
MEX	2000	6175.89	1378.03	1333.46	203.55	0.00	0.00

Country	Year	0-1 months	1-2 months	2-3 months	3-4 months	4-5 months	5+ months
MEX	2010	6454.53	1520.26	1229.65	154.57	0.00	0.00
MEX	2020	6816.17	1640.09	829.08	1090.04	0.00	0.00
MTQ	2000	12.45	0.00	0.00	0.00	0.00	0.00
MTQ	2010	9.72	0.00	0.00	0.00	0.00	0.00
MTQ	2020	8.49	0.00	0.00	0.00	0.00	0.00
NIC	2000	259.98	101.84	258.81	0.00	0.00	0.00
NIC	2010	0.00	317.47	263.79	30.70	0.00	0.00
NIC	2020	0.00	347.51	49.93	215.54	0.00	0.00
PAN	2000	0.00	105.47	4.64	0.00	0.00	0.00
PAN	2010	0.00	111.94	5.24	0.00	0.00	0.00
PAN	2020	0.00	42.04	82.48	0.00	0.00	0.00
PER	2000	2273.85	46.27	70.19	119.97	0.00	0.00
PER	2010	2268.76	83.01	81.30	60.41	85.06	0.00
PER	2020	2471.09	93.15	98.90	136.05	28.74	0.00
PRI	2000	12.26	0.00	0.00	0.00	0.00	0.00
PRI	2010	10.37	0.00	0.00	0.00	0.00	0.00
PRI	2020	8.36	0.00	0.00	0.00	0.00	0.00
PRY	2000	0.00	247.31	399.58	0.00	0.00	0.00
PRY	2010	0.00	559.23	45.41	0.00	0.00	0.00
PRY	2020	0.00	143.11	487.45	5.03	0.00	0.00
SUR	2000	0.00	0.00	4.69	0.00	0.00	0.00
SUR	2010	0.00	0.00	0.54	3.84	0.00	0.00
SUR	2020	0.00	0.00	0.43	4.15	0.00	0.00
URY	2000	1334.20	0.00	0.00	0.00	0.00	0.00
URY	2010	1484.03	0.00	0.00	0.00	0.00	0.00
URY	2020	1566.73	0.00	0.00	0.00	0.00	0.00
USA	2000	0.00	0.00	0.00	0.00	0.00	0.00
USA	2010	0.00	0.00	0.00	0.00	0.00	0.00
USA	2020	0.00	0.00	0.00	0.00	0.00	0.00
VEN	2000	400.44	335.17	587.10	547.11	3.23	0.00
VEN	2010	173.67	381.02	418.15	879.18	118.00	0.00
VEN	2020	174.07	318.58	515.24	784.46	309.49	0.00

Note: This table show the number of children exposed to different temperature thresholds in each country in Latin America and the Caribbean. We obtain it by overlapping cell-level UTCI and child population data and categorizing each cell according to the the corresponding time in months. We show these numbers for 2000, 2010, and 2020

Table F.4: Number of children exposed to combined air pollution and temperature thresholds by country

Country	Year	> IT3 & > 3 months	> IT3 & > 4 month	> IT2 & > 3 month	> IT2 & > 4 month
ARG	2000	0.00	0.00	0.00	0.00
ARG	2010	0.00	0.00	0.00	0.00
ARG	2020	0.00	0.00	0.00	0.00
BLZ	2000	0.00	0.00	0.00	0.00
BLZ	2010	0.00	0.00	0.00	0.00
BLZ	2020	0.00	0.00	0.00	0.00
BOL	2000	25.42	0.00	0.00	0.00
BOL	2010	61.74	0.00	52.56	0.00
BOL	2020	120.57	11.58	75.47	11.58
BRA	2000	531.36	36.66	0.00	0.00
BRA	2010	1296.41	866.09	511.66	335.84
BRA	2020	1256.27	884.46	401.19	370.75
CHL	2000	0.00	0.00	0.00	0.00
CHL	2010	0.00	0.00	0.00	0.00
CHL	2020	0.00	0.00	0.00	0.00
COL	2000	23.96	23.96	0.00	0.00
COL	2010	572.36	195.05	0.47	0.47
COL	2020	916.43	304.62	0.00	0.00
CRI	2000	0.00	0.00	0.00	0.00
CRI	2010	0.00	0.00	0.00	0.00
CRI	2020	0.00	0.00	0.00	0.00
CUB	2000	0.00	0.00	0.00	0.00
CUB	2010	0.00	0.00	0.00	0.00
CUB	2020	0.00	0.00	0.00	0.00
DOM	2000	0.00	0.00	0.00	0.00
DOM	2010	0.00	0.00	0.00	0.00
DOM	2020	0.00	0.00	0.00	0.00
ECU	2000	0.00	0.00	0.00	0.00
ECU	2010	0.00	0.00	0.00	0.00
ECU	2020	0.91	0.00	0.00	0.00
FLK	2000	0.00	0.00	0.00	0.00
FLK	2010	0.00	0.00	0.00	0.00
FLK	2020	0.00	0.00	0.00	0.00
GTM	2000	109.54	0.00	0.00	0.00
GTM	2010	0.00	0.00	0.00	0.00
GTM	2020	124.59	0.00	124.59	0.00
GUF	2000	0.00	0.00	0.00	0.00
GUF	2010	0.00	0.00	0.00	0.00
GUF	2020	0.00	0.00	0.00	0.00
GUY	2000	0.00	0.00	0.00	0.00
GUY	2010	44.11	0.00	0.00	0.00
GUY	2020	47.11	43.38	0.00	0.00
HND	2000	211.51	0.00	0.00	0.00
HND	2010	176.33	0.00	176.33	0.00
HND	2020	174.60	174.60	174.60	174.60
JAM	2000	0.00	0.00	0.00	0.00
JAM	2010	0.00	0.00	0.00	0.00
JAM	2020	0.00	0.00	0.00	0.00

Country	Year	> IT3 & > 3 months	> IT3 & > 4 month	> IT2 & > 3 month	> IT2 & > 4 month
MEX	2000	88.50	0.00	0.00	0.00
MEX	2010	0.00	0.00	0.00	0.00
MEX	2020	624.95	0.00	0.00	0.00
MTQ	2000	0.00	0.00	0.00	0.00
MTQ	2010	0.00	0.00	0.00	0.00
MTQ	2020	0.00	0.00	0.00	0.00
NIC	2000	0.00	0.00	0.00	0.00
NIC	2010	30.70	0.00	0.00	0.00
NIC	2020	215.54	0.00	0.00	0.00
PAN	2000	0.00	0.00	0.00	0.00
PAN	2010	0.00	0.00	0.00	0.00
PAN	2020	0.00	0.00	0.00	0.00
PER	2000	5.20	0.00	0.00	0.00
PER	2010	143.00	85.06	0.83	0.00
PER	2020	156.77	28.74	0.00	0.00
PRI	2000	0.00	0.00	0.00	0.00
PRI	2010	0.00	0.00	0.00	0.00
PRI	2020	0.00	0.00	0.00	0.00
PRY	2000	0.00	0.00	0.00	0.00
PRY	2010	0.00	0.00	0.00	0.00
PRY	2020	5.03	0.00	5.03	0.00
SUR	2000	0.00	0.00	0.00	0.00
SUR	2010	1.57	0.00	0.00	0.00
SUR	2020	0.00	0.00	0.00	0.00
URY	2000	0.00	0.00	0.00	0.00
URY	2010	0.00	0.00	0.00	0.00
URY	2020	0.00	0.00	0.00	0.00
USA	2000	0.00	0.00	0.00	0.00
USA	2010	0.00	0.00	0.00	0.00
USA	2020	0.00	0.00	0.00	0.00
VEN	2000	84.14	0.00	0.00	0.00
VEN	2010	985.31	118.00	57.68	13.77
VEN	2020	683.27	216.70	0.00	0.00

Note: This table show the number of children exposed to different combinations of air pollution and temperature thresholds in each country in Latin America and the Caribbean. We obtain it by overlapping cell-level air pollution, UTCI and child population data and categorizing each cell according to the the corresponding time in months. We show these numbers for 2000, 2010, and 2020

Table F.5: Share of children exposed to PM 2.5 interim targets by country

Country	Year	WHO Guideline	WHO IT-4	WHO IT-3	WHO IT-2	WHO IT-1
ARG	2000	17.82	49.10	33.08	0.00	0.00
ARG	2010	17.27	28.24	52.96	1.53	0.00
ARG	2020	10.95	26.10	62.72	0.23	0.00
BLZ	2000	0.00	100.00	0.00	0.00	0.00
BLZ	2010	0.00	36.05	63.95	0.00	0.00
BLZ	2020	0.00	38.39	61.61	0.00	0.00
BOL	2000	0.00	22.94	77.06	0.00	0.00
BOL	2010	0.00	0.00	17.00	68.71	14.29
BOL	2020	0.00	3.44	48.37	48.18	0.00
BRA	2000	60.90	35.41	3.69	0.00	0.00
BRA	2010	26.93	42.81	26.34	3.93	0.00
BRA	2020	28.52	55.99	12.39	3.10	0.00
CHL	2000	23.24	59.48	17.28	0.00	0.00
CHL	2010	1.66	42.56	55.77	0.00	0.00
CHL	2020	6.25	46.69	47.05	0.00	0.00
COL	2000	11.64	85.71	2.65	0.00	0.00
COL	2010	0.00	2.28	97.71	0.01	0.00
COL	2020	0.00	15.19	84.81	0.00	0.00
CRI	2000	0.00	100.00	0.00	0.00	0.00
CRI	2010	0.00	0.00	100.00	0.00	0.00
CRI	2020	0.00	0.00	100.00	0.00	0.00
CUB	2000	44.83	55.17	0.00	0.00	0.00
CUB	2010	100.00	0.00	0.00	0.00	0.00
CUB	2020	100.00	0.00	0.00	0.00	0.00
DOM	2000	29.72	70.28	0.00	0.00	0.00
DOM	2010	46.57	53.43	0.00	0.00	0.00
DOM	2020	29.93	26.12	43.95	0.00	0.00
ECU	2000	25.13	58.43	16.44	0.00	0.00
ECU	2010	0.00	0.05	99.95	0.00	0.00
ECU	2020	0.00	21.28	78.72	0.00	0.00
FLK	2000	100.00	0.00	0.00	0.00	0.00
FLK	2010	100.00	0.00	0.00	0.00	0.00
FLK	2020	100.00	0.00	0.00	0.00	0.00
GTM	2000	0.00	0.00	97.54	2.46	0.00
GTM	2010	0.00	2.33	61.57	36.10	0.00
GTM	2020	0.00	5.79	30.24	63.97	0.00
GUF	2000	38.71	61.29	0.00	0.00	0.00
GUF	2010	0.00	95.62	4.38	0.00	0.00
GUF	2020	0.00	100.00	0.00	0.00	0.00
GUY	2000	90.00	10.00	0.00	0.00	0.00
GUY	2010	0.00	9.93	90.07	0.00	0.00
GUY	2020	0.00	33.85	66.15	0.00	0.00
HND	2000	1.63	0.39	71.58	26.39	0.00
HND	2010	0.00	0.52	38.14	61.33	0.00
HND	2020	0.00	0.65	14.13	70.48	14.74
JAM	2000	0.00	100.00	0.00	0.00	0.00
JAM	2010	0.00	0.00	100.00	0.00	0.00
JAM	2020	0.00	0.00	100.00	0.00	0.00
MEX	2000	12.11	37.47	50.21	0.21	0.00

Country	Year	WHO Guideline	WHO IT-4	WHO IT-3	WHO IT-2	WHO IT-1
MEX	2010	16.82	36.99	46.19	0.00	0.00
MEX	2020	13.08	36.37	50.55	0.00	0.00
MTQ	2000	100.00	0.00	0.00	0.00	0.00
MTQ	2010	100.00	0.00	0.00	0.00	0.00
MTQ	2020	100.00	0.00	0.00	0.00	0.00
NIC	2000	9.59	50.85	39.56	0.00	0.00
NIC	2010	0.00	15.28	84.72	0.00	0.00
NIC	2020	0.00	56.35	43.65	0.00	0.00
PAN	2000	0.00	100.00	0.00	0.00	0.00
PAN	2010	0.00	65.20	34.80	0.00	0.00
PAN	2020	0.00	100.00	0.00	0.00	0.00
PER	2000	0.10	68.43	31.47	0.00	0.00
PER	2010	0.00	3.93	93.82	2.25	0.00
PER	2020	0.47	10.53	89.00	0.00	0.00
PRI	2000	100.00	0.00	0.00	0.00	0.00
PRI	2010	100.00	0.00	0.00	0.00	0.00
PRI	2020	100.00	0.00	0.00	0.00	0.00
PRY	2000	11.60	87.71	0.68	0.00	0.00
PRY	2010	0.00	50.33	49.67	0.00	0.00
PRY	2020	0.00	0.00	96.25	3.75	0.00
SUR	2000	56.87	43.13	0.00	0.00	0.00
SUR	2010	0.00	51.74	48.26	0.00	0.00
SUR	2020	0.00	100.00	0.00	0.00	0.00
URY	2000	2.78	97.22	0.00	0.00	0.00
URY	2010	5.71	94.29	0.00	0.00	0.00
URY	2020	5.33	94.67	0.00	0.00	0.00
USA	2000	0.00	0.00	0.00	0.00	0.00
USA	2010	0.00	0.00	0.00	0.00	0.00
USA	2020	0.00	0.00	0.00	0.00	0.00
VEN	2000	10.82	81.04	8.15	0.00	0.00
VEN	2010	0.00	7.95	83.59	8.46	0.00
VEN	2020	5.82	28.08	66.09	0.00	0.00

Table F.6: Share of children exposed to temperature > 32 ° by country

Country	Year	0-1 months	0-1 months	1-2 months	2-3 months	4-5 months	5+ months
ARG	2000	85.58	14.42	0.00	0.00	0.00	0.00
ARG	2010	81.71	18.00	0.28	0.00	0.00	0.00
ARG	2020	76.03	22.65	1.32	0.00	0.00	0.00
BOL	2000	89.59	5.18	3.41	1.82	0.00	0.00
BOL	2010	68.26	23.94	3.88	3.92	0.00	0.00
BOL	2020	65.98	21.98	6.20	4.75	1.09	0.00
BRA	2000	37.56	30.93	12.77	17.53	1.21	0.00
BRA	2010	32.70	26.91	14.93	11.85	13.61	0.00
BRA	2020	25.27	27.29	19.99	12.53	14.92	0.00
CHL	2000	100.00	0.00	0.00	0.00	0.00	0.00
CHL	2010	100.00	0.00	0.00	0.00	0.00	0.00
CHL	2020	100.00	0.00	0.00	0.00	0.00	0.00
COL	2000	65.80	7.57	16.71	5.16	4.77	0.00
COL	2010	50.52	20.07	6.77	17.71	4.93	0.00
COL	2020	43.40	24.89	2.67	22.16	6.87	0.00
CRI	2000	0.00	100.00	0.00	0.00	0.00	0.00
CRI	2010	0.00	100.00	0.00	0.00	0.00	0.00
CRI	2020	0.00	0.00	100.00	0.00	0.00	0.00
CUB	2000	3.71	75.90	20.38	0.00	0.00	0.00
CUB	2010	3.69	75.67	20.64	0.00	0.00	0.00
CUB	2020	0.00	55.03	30.40	14.56	0.00	0.00
DOM	2000	27.81	21.80	50.39	0.00	0.00	0.00
DOM	2010	0.00	48.51	51.49	0.00	0.00	0.00
DOM	2020	0.00	49.77	50.23	0.00	0.00	0.00
ECU	2000	57.92	42.03	0.04	0.00	0.00	0.00
ECU	2010	35.54	56.52	7.88	0.06	0.00	0.00
ECU	2020	27.10	58.41	14.40	0.09	0.00	0.00
GTM	2000	21.11	37.33	13.36	28.20	0.00	0.00
GTM	2010	20.00	38.85	39.25	1.90	0.00	0.00
GTM	2020	20.42	1.39	37.73	40.46	0.00	0.00
GUF	2000	0.00	0.00	100.00	0.00	0.00	0.00
GUF	2010	0.00	0.00	45.74	54.26	0.00	0.00
GUF	2020	0.00	0.00	88.85	11.15	0.00	0.00
GUY	2000	10.81	14.28	36.27	38.65	0.00	0.00
GUY	2010	0.00	32.36	0.00	67.64	0.00	0.00
GUY	2020	0.00	40.23	0.00	36.07	23.71	0.00
HND	2000	39.90	0.39	47.14	12.57	0.00	0.00
HND	2010	4.47	38.50	44.95	12.08	0.00	0.00
HND	2020	0.00	42.81	45.31	0.00	11.88	0.00
MEX	2000	47.94	33.61	15.18	3.27	0.00	0.00
MEX	2010	49.73	34.52	15.32	0.43	0.00	0.00
MEX	2020	48.57	29.83	9.59	12.01	0.00	0.00
NIC	2000	53.48	7.09	39.42	0.00	0.00	0.00
NIC	2010	0.00	56.13	26.57	17.29	0.00	0.00
NIC	2020	0.00	58.63	5.46	35.91	0.00	0.00
PAN	2000	0.00	97.55	2.45	0.00	0.00	0.00
PAN	2010	0.00	97.59	2.41	0.00	0.00	0.00
PAN	2020	0.00	48.96	51.04	0.00	0.00	0.00
PER	2000	92.15	0.73	3.11	4.00	0.00	0.00

Country	Year	0-1 months	0-1 months	1-2 months	2-3 months	4-5 months	5+ months
PER	2010	91.29	0.74	2.03	2.83	3.11	0.00
PER	2020	90.78	0.80	2.20	3.71	2.51	0.00
PRI	2000	100.00	0.00	0.00	0.00	0.00	0.00
PRI	2010	100.00	0.00	0.00	0.00	0.00	0.00
PRI	2020	100.00	0.00	0.00	0.00	0.00	0.00
PRY	2000	0.00	67.94	32.06	0.00	0.00	0.00
PRY	2010	0.00	92.48	7.52	0.00	0.00	0.00
PRY	2020	0.00	32.53	67.26	0.21	0.00	0.00
SUR	2000	0.00	0.00	100.00	0.00	0.00	0.00
SUR	2010	0.00	0.00	100.00	0.00	0.00	0.00
SUR	2020	0.00	0.00	100.00	0.00	0.00	0.00
URY	2000	100.00	0.00	0.00	0.00	0.00	0.00
URY	2010	100.00	0.00	0.00	0.00	0.00	0.00
URY	2020	100.00	0.00	0.00	0.00	0.00	0.00
VEN	2000	13.79	7.35	33.53	45.12	0.21	0.00
VEN	2010	6.70	13.06	13.89	61.30	5.05	0.00
VEN	2020	6.63	10.91	15.76	38.02	28.68	0.00

Table F.7: Share of children exposed to temperature > 38 ° by country

Country	Year	0-1 months	0-1 months	1-2 months	2-3 months	4-5 months	5+ months
ARG	2000	100.00	0.00	0.00	0.00	0.00	0.00
ARG	2010	100.00	0.00	0.00	0.00	0.00	0.00
ARG	2020	100.00	0.00	0.00	0.00	0.00	0.00
BOL	2000	100.00	0.00	0.00	0.00	0.00	0.00
BOL	2010	100.00	0.00	0.00	0.00	0.00	0.00
BOL	2020	99.92	0.08	0.00	0.00	0.00	0.00
BRA	2000	100.00	0.00	0.00	0.00	0.00	0.00
BRA	2010	97.86	2.14	0.00	0.00	0.00	0.00
BRA	2020	97.92	2.08	0.00	0.00	0.00	0.00
CHL	2000	100.00	0.00	0.00	0.00	0.00	0.00
CHL	2010	100.00	0.00	0.00	0.00	0.00	0.00
CHL	2020	100.00	0.00	0.00	0.00	0.00	0.00
COL	2000	100.00	0.00	0.00	0.00	0.00	0.00
COL	2010	96.41	3.59	0.00	0.00	0.00	0.00
COL	2020	94.18	5.82	0.00	0.00	0.00	0.00
CRI	2000	100.00	0.00	0.00	0.00	0.00	0.00
CRI	2010	100.00	0.00	0.00	0.00	0.00	0.00
CRI	2020	100.00	0.00	0.00	0.00	0.00	0.00
CUB	2000	100.00	0.00	0.00	0.00	0.00	0.00
CUB	2010	100.00	0.00	0.00	0.00	0.00	0.00
CUB	2020	100.00	0.00	0.00	0.00	0.00	0.00
DOM	2000	100.00	0.00	0.00	0.00	0.00	0.00
DOM	2010	100.00	0.00	0.00	0.00	0.00	0.00
DOM	2020	100.00	0.00	0.00	0.00	0.00	0.00
ECU	2000	100.00	0.00	0.00	0.00	0.00	0.00
ECU	2010	100.00	0.00	0.00	0.00	0.00	0.00
ECU	2020	100.00	0.00	0.00	0.00	0.00	0.00
GTM	2000	100.00	0.00	0.00	0.00	0.00	0.00
GTM	2010	100.00	0.00	0.00	0.00	0.00	0.00
GTM	2020	100.00	0.00	0.00	0.00	0.00	0.00
GUF	2000	100.00	0.00	0.00	0.00	0.00	0.00
GUF	2010	100.00	0.00	0.00	0.00	0.00	0.00
GUF	2020	100.00	0.00	0.00	0.00	0.00	0.00
GUY	2000	100.00	0.00	0.00	0.00	0.00	0.00
GUY	2010	100.00	0.00	0.00	0.00	0.00	0.00
GUY	2020	100.00	0.00	0.00	0.00	0.00	0.00
HND	2000	100.00	0.00	0.00	0.00	0.00	0.00
HND	2010	100.00	0.00	0.00	0.00	0.00	0.00
HND	2020	100.00	0.00	0.00	0.00	0.00	0.00
MEX	2000	99.27	0.73	0.00	0.00	0.00	0.00
MEX	2010	99.19	0.81	0.00	0.00	0.00	0.00
MEX	2020	99.02	0.98	0.00	0.00	0.00	0.00
NIC	2000	100.00	0.00	0.00	0.00	0.00	0.00
NIC	2010	100.00	0.00	0.00	0.00	0.00	0.00
NIC	2020	100.00	0.00	0.00	0.00	0.00	0.00
PAN	2000	100.00	0.00	0.00	0.00	0.00	0.00
PAN	2010	100.00	0.00	0.00	0.00	0.00	0.00
PAN	2020	100.00	0.00	0.00	0.00	0.00	0.00
PER	2000	100.00	0.00	0.00	0.00	0.00	0.00

Country	Year	0-1 months	0-1 months	1-2 months	2-3 months	4-5 months	5+ months
PER	2010	100.00	0.00	0.00	0.00	0.00	0.00
PER	2020	100.00	0.00	0.00	0.00	0.00	0.00
PRI	2000	100.00	0.00	0.00	0.00	0.00	0.00
PRI	2010	100.00	0.00	0.00	0.00	0.00	0.00
PRI	2020	100.00	0.00	0.00	0.00	0.00	0.00
PRY	2000	100.00	0.00	0.00	0.00	0.00	0.00
PRY	2010	100.00	0.00	0.00	0.00	0.00	0.00
PRY	2020	99.33	0.67	0.00	0.00	0.00	0.00
SUR	2000	100.00	0.00	0.00	0.00	0.00	0.00
SUR	2010	100.00	0.00	0.00	0.00	0.00	0.00
SUR	2020	100.00	0.00	0.00	0.00	0.00	0.00
URY	2000	100.00	0.00	0.00	0.00	0.00	0.00
URY	2010	100.00	0.00	0.00	0.00	0.00	0.00
URY	2020	100.00	0.00	0.00	0.00	0.00	0.00
VEN	2000	100.00	0.00	0.00	0.00	0.00	0.00
VEN	2010	98.22	1.78	0.00	0.00	0.00	0.00
VEN	2020	78.65	21.35	0.00	0.00	0.00	0.00

G ADMIN 1

Table G.1: Mean PM 2.5 and time above temperature thresholds by Admin 1

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
AR002	2000	12.22	0.14	0.05	0.00
AR002	2010	11.26	0.16	0.05	0.00
AR002	2020	12.48	0.17	0.06	0.00
AR006	2000	12.01	0.12	0.03	0.00
AR006	2010	11.17	0.13	0.04	0.00
AR006	2020	11.69	0.14	0.04	0.00
AR010	2000	12.81	0.16	0.04	0.01
AR010	2010	15.36	0.19	0.06	0.01
AR010	2020	15.56	0.23	0.07	0.02
AR014	2000	14.77	0.15	0.04	0.00
AR014	2010	17.98	0.18	0.06	0.01
AR014	2020	19.99	0.20	0.06	0.01
AR018	2000	11.13	0.24	0.10	0.01
AR018	2010	9.96	0.25	0.10	0.01
AR018	2020	15.51	0.29	0.13	0.03
AR022	2000	11.87	0.27	0.12	0.02
AR022	2010	12.48	0.30	0.13	0.03
AR022	2020	20.89	0.35	0.17	0.04
AR026	2000	6.62	0.02	0.00	0.00
AR026	2010	13.39	0.02	0.00	0.00
AR026	2020	10.62	0.03	0.01	0.00
AR030	2000	11.22	0.17	0.06	0.01
AR030	2010	10.11	0.19	0.07	0.00
AR030	2020	11.97	0.21	0.07	0.00
AR034	2000	12.16	0.30	0.14	0.03
AR034	2010	14.39	0.32	0.15	0.04
AR034	2020	23.23	0.38	0.19	0.05
AR038	2000	17.49	0.08	0.01	0.00
AR038	2010	21.64	0.09	0.02	0.00
AR038	2020	17.44	0.11	0.03	0.00
AR042	2000	7.33	0.12	0.04	0.00
AR042	2010	11.17	0.14	0.05	0.01
AR042	2020	9.51	0.16	0.06	0.01
AR046	2000	12.27	0.16	0.04	0.01
AR046	2010	16.35	0.20	0.07	0.01
AR046	2020	13.83	0.22	0.08	0.02
AR050	2000	17.96	0.08	0.01	0.00
AR050	2010	21.80	0.09	0.02	0.00
AR050	2020	18.36	0.11	0.03	0.00
AR054	2000	8.34	0.29	0.13	0.01
AR054	2010	11.21	0.29	0.12	0.01
AR054	2020	14.26	0.33	0.16	0.02
AR058	2000	11.39	0.03	0.00	0.00
AR058	2010	17.17	0.04	0.00	0.00
AR058	2020	15.12	0.06	0.01	0.00
AR062	2000	7.65	0.07	0.02	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
AR062	2010	14.22	0.08	0.03	0.00
AR062	2020	11.20	0.10	0.03	0.00
AR066	2000	14.09	0.14	0.04	0.00
AR066	2010	18.42	0.16	0.05	0.01
AR066	2020	17.72	0.19	0.06	0.01
AR070	2000	12.68	0.13	0.03	0.00
AR070	2010	16.90	0.16	0.05	0.01
AR070	2020	14.84	0.17	0.06	0.01
AR074	2000	11.89	0.16	0.05	0.01
AR074	2010	17.13	0.20	0.08	0.02
AR074	2020	16.24	0.22	0.10	0.02
AR078	2000	5.15	0.01	0.00	0.00
AR078	2010	9.11	0.01	0.00	0.00
AR078	2020	6.94	0.01	0.00	0.00
AR082	2000	11.85	0.19	0.07	0.01
AR082	2010	11.20	0.22	0.09	0.01
AR082	2020	15.00	0.24	0.09	0.01
AR086	2000	12.26	0.18	0.06	0.01
AR086	2010	14.96	0.21	0.08	0.01
AR086	2020	18.32	0.26	0.10	0.02
AR090	2000	13.20	0.14	0.03	0.00
AR090	2010	16.47	0.16	0.04	0.00
AR090	2020	17.62	0.20	0.06	0.01
AR094	2000	4.06	0.00	0.00	0.00
AR094	2010	4.93	0.00	0.00	0.00
AR094	2020	4.95	0.00	0.00	0.00
BO01	2000	17.57	0.08	0.01	0.00
BO01	2010	28.60	0.10	0.02	0.00
BO01	2020	22.44	0.11	0.02	0.00
BO02	2000	17.51	0.05	0.01	0.00
BO02	2010	26.62	0.07	0.02	0.00
BO02	2020	21.09	0.08	0.03	0.00
BO03	2000	19.48	0.05	0.01	0.00
BO03	2010	31.92	0.06	0.01	0.00
BO03	2020	24.37	0.06	0.01	0.00
BO04	2000	17.04	0.06	0.00	0.00
BO04	2010	25.37	0.07	0.00	0.00
BO04	2020	19.53	0.07	0.01	0.00
BO05	2000	19.74	0.02	0.00	0.00
BO05	2010	32.34	0.03	0.00	0.00
BO05	2020	23.95	0.03	0.00	0.00
BO06	2000	12.50	0.17	0.06	0.01
BO06	2010	21.77	0.20	0.07	0.01
BO06	2020	19.95	0.22	0.08	0.02
BO07	2000	16.54	0.25	0.09	0.00
BO07	2010	32.06	0.29	0.11	0.01
BO07	2020	27.81	0.34	0.14	0.02
BO08	2000	16.65	0.36	0.16	0.01
BO08	2010	31.59	0.42	0.18	0.02
BO08	2020	25.01	0.45	0.21	0.03

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
BO09	2000	13.98	0.51	0.28	0.01
BO09	2010	29.15	0.62	0.32	0.04
BO09	2020	24.10	0.61	0.32	0.05
BR11	2000	17.31	0.56	0.31	0.02
BR11	2010	30.62	0.67	0.33	0.06
BR11	2020	27.79	0.67	0.35	0.07
BR12	2000	12.70	0.53	0.28	0.01
BR12	2010	25.50	0.67	0.33	0.04
BR12	2020	21.23	0.65	0.33	0.04
BR13	2000	15.44	0.67	0.29	0.01
BR13	2010	25.92	0.82	0.35	0.04
BR13	2020	24.30	0.82	0.35	0.04
BR14	2000	10.13	0.51	0.24	0.01
BR14	2010	19.96	0.62	0.28	0.02
BR14	2020	15.80	0.62	0.28	0.03
BR15	2000	9.08	0.56	0.27	0.01
BR15	2010	15.43	0.73	0.34	0.03
BR15	2020	13.93	0.70	0.32	0.02
BR16	2000	7.91	0.48	0.23	0.00
BR16	2010	13.97	0.62	0.30	0.02
BR16	2020	12.08	0.59	0.28	0.01
BR17	2000	9.16	0.52	0.31	0.02
BR17	2010	16.21	0.63	0.35	0.05
BR17	2020	12.60	0.60	0.34	0.05
BR21	2000	7.98	0.54	0.30	0.02
BR21	2010	11.59	0.67	0.35	0.05
BR21	2020	11.69	0.65	0.34	0.04
BR22	2000	6.54	0.54	0.29	0.03
BR22	2010	8.41	0.64	0.34	0.07
BR22	2020	8.72	0.62	0.33	0.06
BR23	2000	6.25	0.48	0.24	0.03
BR23	2010	7.64	0.56	0.29	0.06
BR23	2020	7.85	0.56	0.28	0.04
BR24	2000	5.72	0.44	0.23	0.03
BR24	2010	7.22	0.50	0.27	0.05
BR24	2020	6.87	0.51	0.27	0.05
BR25	2000	5.64	0.39	0.16	0.01
BR25	2010	7.50	0.43	0.20	0.02
BR25	2020	6.71	0.45	0.20	0.02
BR26	2000	5.92	0.37	0.13	0.01
BR26	2010	8.04	0.40	0.17	0.02
BR26	2020	6.90	0.42	0.17	0.02
BR27	2000	7.05	0.35	0.11	0.01
BR27	2010	8.67	0.36	0.14	0.01
BR27	2020	6.61	0.39	0.16	0.02
BR28	2000	8.01	0.36	0.13	0.01
BR28	2010	9.22	0.37	0.17	0.02
BR28	2020	6.65	0.41	0.18	0.03
BR29	2000	7.28	0.36	0.12	0.00
BR29	2010	9.05	0.38	0.16	0.01

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
BR29	2020	7.10	0.39	0.16	0.02
BR31	2000	9.61	0.31	0.09	0.00
BR31	2010	13.38	0.33	0.12	0.01
BR31	2020	11.44	0.34	0.12	0.01
BR32	2000	7.87	0.31	0.10	0.00
BR32	2010	8.61	0.34	0.13	0.01
BR32	2020	8.68	0.34	0.13	0.01
BR33	2000	10.12	0.28	0.09	0.00
BR33	2010	12.17	0.31	0.11	0.01
BR33	2020	11.82	0.31	0.10	0.01
BR35	2000	11.25	0.25	0.06	0.00
BR35	2010	16.83	0.26	0.08	0.00
BR35	2020	13.75	0.27	0.08	0.01
BR41	2000	8.50	0.25	0.08	0.00
BR41	2010	11.37	0.25	0.08	0.00
BR41	2020	12.79	0.29	0.11	0.01
BR42	2000	9.19	0.18	0.04	0.00
BR42	2010	11.56	0.18	0.04	0.00
BR42	2020	12.16	0.21	0.05	0.00
BR43	2000	9.57	0.19	0.06	0.00
BR43	2010	11.11	0.19	0.06	0.00
BR43	2020	11.60	0.22	0.08	0.01
BR50	2000	8.36	0.39	0.19	0.02
BR50	2010	13.90	0.39	0.19	0.02
BR50	2020	16.13	0.44	0.23	0.05
BR51	2000	13.93	0.49	0.28	0.02
BR51	2010	23.68	0.54	0.30	0.05
BR51	2020	20.14	0.56	0.32	0.07
BR52	2000	8.11	0.38	0.15	0.00
BR52	2010	12.60	0.41	0.19	0.01
BR52	2020	10.62	0.40	0.19	0.02
BR53	2000	8.37	0.36	0.13	0.00
BR53	2010	13.22	0.39	0.18	0.00
BR53	2020	10.98	0.38	0.17	0.01
BZ01	2000	11.28	0.40	0.15	0.01
BZ01	2010	14.03	0.46	0.20	0.02
BZ01	2020	14.25	0.47	0.22	0.04
BZ02	2000	14.09	0.44	0.19	0.01
BZ02	2010	13.92	0.51	0.23	0.04
BZ02	2020	13.98	0.52	0.26	0.06
BZ03	2000	9.88	0.46	0.16	0.00
BZ03	2010	10.01	0.54	0.21	0.02
BZ03	2020	11.73	0.59	0.24	0.03
BZ04	2000	10.96	0.46	0.22	0.03
BZ04	2010	12.94	0.53	0.25	0.06
BZ04	2020	13.01	0.56	0.28	0.08
BZ05	2000	11.28	0.40	0.15	0.01
BZ05	2010	14.03	0.46	0.20	0.02
BZ05	2020	14.25	0.47	0.22	0.04
BZ06	2000	15.00	0.40	0.15	0.01

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
BZ06	2010	17.15	0.45	0.18	0.02
BZ06	2020	18.14	0.47	0.21	0.03
CL01	2000	12.68	0.12	0.00	0.00
CL01	2010	17.14	0.11	0.01	0.00
CL01	2020	13.01	0.14	0.01	0.00
CL02	2000	12.28	0.08	0.00	0.00
CL02	2010	16.02	0.08	0.01	0.00
CL02	2020	10.61	0.10	0.01	0.00
CL03	2000	12.05	0.11	0.00	0.00
CL03	2010	14.81	0.10	0.00	0.00
CL03	2020	11.22	0.13	0.00	0.00
CL04	2000	12.79	0.11	0.00	0.00
CL04	2010	15.19	0.10	0.00	0.00
CL04	2020	12.78	0.13	0.01	0.00
CL05	2000	14.55	0.12	0.01	0.00
CL05	2010	17.37	0.12	0.01	0.00
CL05	2020	15.68	0.15	0.03	0.00
CL06	2000	15.36	0.13	0.01	0.00
CL06	2010	17.55	0.13	0.02	0.00
CL06	2020	16.88	0.17	0.04	0.00
CL07	2000	14.62	0.10	0.01	0.00
CL07	2010	16.85	0.10	0.01	0.00
CL07	2020	15.95	0.13	0.03	0.00
CL08	2000	10.96	0.02	0.00	0.00
CL08	2010	15.83	0.03	0.00	0.00
CL08	2020	14.69	0.05	0.01	0.00
CL09	2000	10.79	0.02	0.00	0.00
CL09	2010	15.94	0.03	0.00	0.00
CL09	2020	14.62	0.04	0.00	0.00
CL10	2000	9.32	0.01	0.00	0.00
CL10	2010	16.86	0.01	0.00	0.00
CL10	2020	14.01	0.02	0.00	0.00
CL11	2000	6.22	0.00	0.00	0.00
CL11	2010	14.74	0.00	0.00	0.00
CL11	2020	11.41	0.00	0.00	0.00
CL12	2000	4.25	0.00	0.00	0.00
CL12	2010	5.37	0.00	0.00	0.00
CL12	2020	5.32	0.00	0.00	0.00
CL13	2000	19.35	0.07	0.00	0.00
CL13	2010	23.34	0.07	0.01	0.00
CL13	2020	18.71	0.09	0.02	0.00
CL14	2000	9.83	0.01	0.00	0.00
CL14	2010	16.06	0.01	0.00	0.00
CL14	2020	13.99	0.02	0.00	0.00
CL15	2000	14.76	0.13	0.01	0.00
CL15	2010	18.77	0.14	0.01	0.00
CL15	2020	14.21	0.15	0.01	0.00
CL16	2000	10.96	0.04	0.00	0.00
CL16	2010	14.54	0.04	0.00	0.00
CL16	2020	13.69	0.07	0.01	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
CO05	2000	11.17	0.31	0.09	0.01
CO05	2010	20.33	0.38	0.10	0.02
CO05	2020	18.04	0.43	0.13	0.03
CO11	2000	14.40	0.16	0.03	0.00
CO11	2010	22.80	0.19	0.05	0.00
CO11	2020	21.09	0.20	0.06	0.01
CO13	2000	11.87	0.41	0.15	0.02
CO13	2010	20.06	0.49	0.15	0.03
CO13	2020	18.03	0.54	0.20	0.06
CO15	2000	12.68	0.20	0.04	0.00
CO15	2010	22.38	0.23	0.06	0.01
CO15	2020	19.66	0.25	0.07	0.01
CO17	2000	11.90	0.26	0.02	0.00
CO17	2010	19.22	0.31	0.04	0.00
CO17	2020	19.12	0.35	0.05	0.00
CO18	2000	11.61	0.23	0.06	0.00
CO18	2010	16.48	0.29	0.08	0.00
CO18	2020	15.19	0.30	0.09	0.00
CO19	2000	12.06	0.21	0.02	0.00
CO19	2010	16.17	0.26	0.04	0.00
CO19	2020	14.55	0.28	0.04	0.00
CO20	2000	13.55	0.59	0.24	0.03
CO20	2010	16.68	0.67	0.25	0.05
CO20	2020	16.91	0.71	0.29	0.08
CO23	2000	13.15	0.62	0.28	0.03
CO23	2010	18.47	0.74	0.29	0.06
CO23	2020	16.64	0.78	0.33	0.10
CO25	2000	13.92	0.18	0.04	0.00
CO25	2010	22.51	0.20	0.05	0.00
CO25	2020	20.97	0.22	0.06	0.01
CO27	2000	14.27	0.51	0.08	0.00
CO27	2010	16.20	0.63	0.11	0.00
CO27	2020	15.14	0.68	0.13	0.00
CO41	2000	12.54	0.16	0.01	0.00
CO41	2010	17.07	0.19	0.02	0.00
CO41	2020	16.10	0.21	0.03	0.00
CO44	2000	12.74	0.50	0.18	0.02
CO44	2010	15.41	0.60	0.22	0.03
CO44	2020	15.35	0.61	0.24	0.05
CO47	2000	13.64	0.65	0.27	0.04
CO47	2010	16.80	0.75	0.28	0.06
CO47	2020	16.97	0.78	0.33	0.10
CO50	2000	13.83	0.19	0.05	0.00
CO50	2010	22.12	0.23	0.07	0.01
CO50	2020	20.29	0.24	0.08	0.01
CO52	2000	12.26	0.24	0.04	0.00
CO52	2010	16.76	0.31	0.06	0.00
CO52	2020	15.13	0.34	0.07	0.00
CO54	2000	14.03	0.54	0.22	0.02
CO54	2010	20.77	0.60	0.24	0.04

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
CO54	2020	18.62	0.66	0.29	0.07
CO63	2000	13.48	0.31	0.04	0.00
CO63	2010	17.74	0.38	0.07	0.00
CO63	2020	18.75	0.42	0.09	0.00
CO66	2000	13.30	0.34	0.06	0.00
CO66	2010	17.34	0.43	0.08	0.00
CO66	2020	17.99	0.48	0.11	0.00
CO68	2000	11.23	0.25	0.06	0.00
CO68	2010	21.54	0.30	0.07	0.01
CO68	2020	18.75	0.35	0.10	0.02
CO70	2000	13.89	0.68	0.30	0.03
CO70	2010	17.94	0.80	0.30	0.06
CO70	2020	17.32	0.82	0.35	0.10
CO73	2000	12.78	0.16	0.01	0.00
CO73	2010	19.04	0.20	0.02	0.00
CO73	2020	18.45	0.22	0.02	0.00
CO76	2000	13.50	0.18	0.01	0.00
CO76	2010	17.21	0.22	0.02	0.00
CO76	2020	17.03	0.25	0.02	0.00
CO81	2000	12.14	0.25	0.07	0.00
CO81	2010	23.95	0.31	0.10	0.01
CO81	2020	18.57	0.33	0.12	0.01
CO85	2000	13.91	0.20	0.05	0.00
CO85	2010	22.46	0.23	0.07	0.01
CO85	2020	19.97	0.25	0.09	0.01
CO86	2000	11.77	0.23	0.06	0.00
CO86	2010	16.39	0.30	0.08	0.00
CO86	2020	14.73	0.32	0.09	0.00
CO91	2000	12.53	0.56	0.28	0.00
CO91	2010	23.92	0.74	0.32	0.03
CO91	2020	22.27	0.73	0.33	0.03
CO94	2000	10.99	0.51	0.26	0.00
CO94	2010	19.30	0.66	0.32	0.03
CO94	2020	17.82	0.67	0.33	0.03
CO95	2000	11.85	0.46	0.23	0.00
CO95	2010	18.60	0.58	0.29	0.02
CO95	2020	17.47	0.57	0.29	0.01
CO97	2000	10.88	0.48	0.25	0.00
CO97	2010	19.99	0.62	0.31	0.02
CO97	2020	19.04	0.62	0.32	0.02
CO99	2000	12.86	0.52	0.26	0.01
CO99	2010	20.99	0.68	0.32	0.04
CO99	2020	17.18	0.68	0.34	0.04
CR1	2000	12.97	0.51	0.11	0.00
CR1	2010	17.53	0.56	0.15	0.00
CR1	2020	14.68	0.59	0.17	0.00
CR2	2000	13.10	0.41	0.08	0.00
CR2	2010	16.38	0.54	0.13	0.01
CR2	2020	14.85	0.54	0.13	0.01
CR3	2000	12.91	0.53	0.11	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
CR3	2010	17.40	0.57	0.16	0.00
CR3	2020	14.71	0.60	0.17	0.00
CR4	2000	12.66	0.37	0.08	0.00
CR4	2010	17.64	0.47	0.14	0.01
CR4	2020	12.65	0.49	0.14	0.01
CR5	2000	13.24	0.43	0.09	0.00
CR5	2010	15.77	0.55	0.14	0.01
CR5	2020	15.37	0.55	0.14	0.01
CR6	2000	13.18	0.59	0.13	0.00
CR6	2010	17.45	0.61	0.16	0.00
CR6	2020	16.05	0.66	0.19	0.00
CR7	2000	12.91	0.53	0.11	0.00
CR7	2010	17.40	0.57	0.16	0.00
CR7	2020	14.71	0.60	0.17	0.00
DO01	2000	10.62	0.38	0.08	0.00
DO01	2010	9.86	0.45	0.12	0.00
DO01	2020	12.55	0.46	0.12	0.00
DO04	2000	11.16	0.39	0.10	0.00
DO04	2010	11.38	0.44	0.13	0.00
DO04	2020	13.43	0.46	0.13	0.00
DO05	2000	12.43	0.51	0.17	0.00
DO05	2010	12.52	0.56	0.19	0.00
DO05	2020	15.07	0.60	0.21	0.01
DO06	2000	12.43	0.51	0.17	0.00
DO06	2010	12.52	0.56	0.19	0.00
DO06	2020	15.07	0.60	0.21	0.01
DO07	2000	11.16	0.39	0.10	0.00
DO07	2010	11.38	0.44	0.13	0.00
DO07	2020	13.43	0.46	0.13	0.00
DO08	2000	11.16	0.39	0.10	0.00
DO08	2010	11.38	0.44	0.13	0.00
DO08	2020	13.43	0.46	0.13	0.00
DO09	2000	12.43	0.51	0.17	0.00
DO09	2010	12.52	0.56	0.19	0.00
DO09	2020	15.07	0.60	0.21	0.01
DO10	2000	8.85	0.41	0.10	0.00
DO10	2010	7.90	0.49	0.14	0.00
DO10	2020	9.36	0.52	0.15	0.00
EC01	2000	12.89	0.25	0.05	0.00
EC01	2010	20.02	0.31	0.08	0.00
EC01	2020	18.13	0.33	0.09	0.00
EC02	2000	14.80	0.33	0.09	0.00
EC02	2010	19.33	0.42	0.13	0.00
EC02	2020	18.69	0.44	0.15	0.00
EC03	2000	13.32	0.27	0.06	0.00
EC03	2010	20.34	0.34	0.09	0.00
EC03	2020	18.73	0.36	0.10	0.00
EC04	2000	12.07	0.22	0.05	0.00
EC04	2010	17.60	0.29	0.07	0.00
EC04	2020	15.79	0.32	0.09	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
EC05	2000	15.24	0.32	0.08	0.00
EC05	2010	19.72	0.41	0.11	0.00
EC05	2020	18.42	0.43	0.13	0.00
EC06	2000	13.91	0.29	0.07	0.00
EC06	2010	20.00	0.37	0.10	0.00
EC06	2020	18.72	0.39	0.12	0.00
EC08	2000	12.79	0.33	0.08	0.00
EC08	2010	15.41	0.43	0.10	0.00
EC08	2020	14.43	0.45	0.13	0.00
EC09	2000	14.42	0.34	0.10	0.00
EC09	2010	17.04	0.44	0.13	0.00
EC09	2020	17.02	0.46	0.16	0.00
EC10	2000	12.07	0.22	0.05	0.00
EC10	2010	17.60	0.29	0.07	0.00
EC10	2020	15.79	0.32	0.09	0.00
EC11	2000	15.66	0.40	0.12	0.00
EC11	2010	19.47	0.42	0.15	0.01
EC11	2020	16.97	0.44	0.21	0.01
EC12	2000	14.42	0.34	0.10	0.00
EC12	2010	17.04	0.44	0.13	0.00
EC12	2020	17.02	0.46	0.16	0.00
EC13	2000	14.46	0.34	0.10	0.00
EC13	2010	15.76	0.45	0.13	0.00
EC13	2020	16.07	0.47	0.16	0.00
EC14	2000	12.72	0.21	0.04	0.00
EC14	2010	20.52	0.27	0.06	0.00
EC14	2020	17.43	0.28	0.07	0.00
EC15	2000	12.12	0.13	0.02	0.00
EC15	2010	20.30	0.17	0.04	0.00
EC15	2020	17.07	0.18	0.04	0.00
EC16	2000	12.67	0.20	0.04	0.00
EC16	2010	20.79	0.26	0.07	0.00
EC16	2020	16.74	0.26	0.07	0.00
EC17	2000	12.04	0.14	0.03	0.00
EC17	2010	19.01	0.19	0.04	0.00
EC17	2020	16.32	0.20	0.05	0.00
EC18	2000	15.75	0.30	0.07	0.00
EC18	2010	22.23	0.38	0.10	0.00
EC18	2020	19.84	0.40	0.12	0.00
EC19	2000	13.08	0.27	0.07	0.00
EC19	2010	18.32	0.29	0.09	0.01
EC19	2020	14.70	0.31	0.12	0.02
EC21	2000	10.35	0.09	0.03	0.00
EC21	2010	18.29	0.13	0.05	0.00
EC21	2020	15.42	0.14	0.05	0.00
EC22	2000	9.83	0.07	0.02	0.00
EC22	2010	19.10	0.10	0.03	0.00
EC22	2020	15.31	0.10	0.03	0.00
EC23	2000	15.61	0.30	0.07	0.00
EC23	2010	20.19	0.39	0.10	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
EC23	2020	18.04	0.41	0.12	0.00
EC90	2000	13.44	0.33	0.09	0.00
EC90	2010	16.97	0.42	0.12	0.00
EC90	2020	16.10	0.45	0.14	0.00
GT01	2000	19.06	0.34	0.15	0.01
GT01	2010	22.96	0.37	0.15	0.02
GT01	2020	28.36	0.40	0.17	0.03
GT02	2000	20.35	0.26	0.08	0.00
GT02	2010	23.33	0.30	0.09	0.01
GT02	2020	24.36	0.32	0.10	0.01
GT03	2000	19.06	0.34	0.15	0.01
GT03	2010	22.96	0.37	0.15	0.02
GT03	2020	28.36	0.40	0.17	0.03
GT04	2000	19.42	0.40	0.17	0.01
GT04	2010	23.10	0.43	0.17	0.02
GT04	2020	28.25	0.47	0.19	0.03
GT05	2000	19.41	0.40	0.17	0.01
GT05	2010	23.09	0.43	0.17	0.02
GT05	2020	28.24	0.47	0.19	0.03
GT06	2000	19.05	0.34	0.15	0.01
GT06	2010	22.95	0.37	0.15	0.02
GT06	2020	28.34	0.40	0.17	0.03
GT07	2000	21.34	0.71	0.25	0.01
GT07	2010	23.74	0.71	0.24	0.01
GT07	2020	27.77	0.79	0.30	0.02
GT08	2000	21.34	0.52	0.18	0.00
GT08	2010	21.92	0.53	0.18	0.01
GT08	2020	23.78	0.58	0.22	0.01
GT09	2000	21.34	0.52	0.18	0.00
GT09	2010	21.92	0.53	0.18	0.01
GT09	2020	23.78	0.58	0.22	0.01
GT10	2000	21.34	0.71	0.25	0.01
GT10	2010	23.74	0.71	0.24	0.01
GT10	2020	27.77	0.79	0.30	0.02
GT11	2000	21.34	0.71	0.25	0.01
GT11	2010	23.74	0.71	0.24	0.01
GT11	2020	27.77	0.79	0.30	0.02
GT12	2000	21.26	0.53	0.18	0.00
GT12	2010	21.62	0.53	0.18	0.01
GT12	2020	23.55	0.58	0.22	0.01
GT13	2000	21.30	0.30	0.08	0.00
GT13	2010	17.85	0.32	0.08	0.00
GT13	2020	17.97	0.34	0.10	0.01
GT14	2000	20.49	0.29	0.10	0.01
GT14	2010	20.91	0.32	0.10	0.01
GT14	2020	22.61	0.35	0.12	0.01
GT15	2000	19.05	0.27	0.10	0.01
GT15	2010	21.21	0.30	0.10	0.01
GT15	2020	22.95	0.32	0.12	0.02
GT16	2000	19.77	0.23	0.06	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
GT16	2010	18.98	0.28	0.08	0.01
GT16	2020	17.86	0.30	0.10	0.01
GT17	2000	19.45	0.29	0.10	0.01
GT17	2010	17.21	0.33	0.11	0.02
GT17	2020	17.33	0.35	0.13	0.02
GT18	2000	15.02	0.39	0.14	0.00
GT18	2010	18.15	0.44	0.17	0.02
GT18	2020	19.48	0.46	0.19	0.02
GT19	2000	20.95	0.28	0.06	0.00
GT19	2010	24.63	0.32	0.08	0.00
GT19	2020	24.56	0.34	0.10	0.01
GT20	2000	22.17	0.26	0.05	0.00
GT20	2010	26.57	0.29	0.06	0.00
GT20	2020	26.74	0.31	0.08	0.00
GT21	2000	20.92	0.29	0.09	0.01
GT21	2010	25.07	0.32	0.10	0.01
GT21	2020	27.43	0.35	0.12	0.01
GT22	2000	20.98	0.31	0.09	0.01
GT22	2010	25.16	0.33	0.10	0.01
GT22	2020	27.51	0.36	0.12	0.01
GY01	2000	9.34	0.45	0.17	0.00
GY01	2010	13.66	0.57	0.26	0.01
GY01	2020	10.47	0.56	0.26	0.01
GY02	2000	9.19	0.46	0.18	0.00
GY02	2010	13.70	0.56	0.27	0.01
GY02	2020	10.26	0.53	0.26	0.01
GY03	2000	8.82	0.47	0.20	0.00
GY03	2010	14.40	0.57	0.28	0.01
GY03	2020	10.65	0.54	0.27	0.01
GY04	2000	8.82	0.47	0.20	0.00
GY04	2010	14.40	0.57	0.28	0.01
GY04	2020	10.65	0.54	0.27	0.01
GY05	2000	9.69	0.48	0.21	0.00
GY05	2010	17.33	0.61	0.28	0.01
GY05	2020	13.07	0.57	0.27	0.01
GY06	2000	9.07	0.46	0.20	0.00
GY06	2010	17.79	0.56	0.26	0.01
GY06	2020	13.76	0.54	0.26	0.01
GY07	2000	8.68	0.43	0.16	0.00
GY07	2010	15.00	0.51	0.24	0.01
GY07	2020	11.38	0.48	0.23	0.01
GY08	2000	8.92	0.40	0.12	0.00
GY08	2010	17.38	0.44	0.15	0.00
GY08	2020	14.23	0.42	0.14	0.00
GY09	2000	9.63	0.52	0.25	0.01
GY09	2010	20.16	0.63	0.30	0.02
GY09	2020	15.58	0.64	0.31	0.03
GY10	2000	9.16	0.46	0.19	0.00
GY10	2010	17.15	0.57	0.25	0.01
GY10	2020	13.00	0.53	0.24	0.01

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
HN03	2000	20.72	0.29	0.06	0.00
HN03	2010	28.99	0.31	0.10	0.00
HN03	2020	35.56	0.34	0.11	0.00
HN04	2000	20.37	0.30	0.07	0.00
HN04	2010	24.93	0.33	0.10	0.01
HN04	2020	26.49	0.36	0.12	0.01
HN05	2000	18.96	0.32	0.09	0.00
HN05	2010	26.47	0.35	0.12	0.01
HN05	2020	32.41	0.38	0.14	0.01
HN06	2000	22.26	0.52	0.27	0.02
HN06	2010	25.00	0.55	0.27	0.04
HN06	2020	29.80	0.58	0.30	0.05
HN07	2000	20.08	0.40	0.15	0.01
HN07	2010	23.27	0.42	0.16	0.02
HN07	2020	27.16	0.44	0.18	0.02
HN08	2000	21.00	0.40	0.16	0.01
HN08	2010	25.14	0.42	0.17	0.02
HN08	2020	29.91	0.44	0.19	0.02
HN09	2000	9.96	0.40	0.11	0.00
HN09	2010	16.09	0.44	0.17	0.01
HN09	2020	14.36	0.47	0.19	0.00
HN10	2000	23.20	0.41	0.13	0.00
HN10	2010	29.90	0.42	0.15	0.01
HN10	2020	34.07	0.46	0.18	0.01
HN12	2000	22.97	0.44	0.17	0.01
HN12	2010	28.93	0.45	0.18	0.01
HN12	2020	33.22	0.49	0.21	0.02
HN13	2000	24.04	0.44	0.15	0.00
HN13	2010	30.34	0.45	0.17	0.01
HN13	2020	34.20	0.49	0.20	0.01
HN14	2000	22.03	0.27	0.05	0.00
HN14	2010	27.32	0.29	0.07	0.00
HN14	2020	29.29	0.32	0.09	0.00
HN15	2000	18.55	0.30	0.05	0.00
HN15	2010	22.42	0.32	0.09	0.00
HN15	2020	25.72	0.35	0.11	0.00
HN16	2000	18.96	0.32	0.09	0.00
HN16	2010	26.47	0.35	0.12	0.01
HN16	2020	32.41	0.38	0.14	0.01
HN17	2000	22.20	0.55	0.31	0.02
HN17	2010	25.30	0.58	0.30	0.05
HN17	2020	29.86	0.62	0.33	0.05
HN18	2000	19.29	0.28	0.05	0.00
HN18	2010	28.04	0.30	0.08	0.00
HN18	2020	33.53	0.33	0.10	0.00
HT01	2000	12.57	0.54	0.18	0.01
HT01	2010	12.23	0.59	0.20	0.00
HT01	2020	15.12	0.63	0.22	0.01
HT02	2000	12.57	0.54	0.18	0.01
HT02	2010	12.23	0.59	0.20	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
HT02	2020	15.12	0.63	0.22	0.01
HT06	2000	12.57	0.54	0.18	0.01
HT06	2010	12.23	0.59	0.20	0.00
HT06	2020	15.12	0.63	0.22	0.01
JM.KI	2000	13.47	0.45	0.08	0.00
JM.KI	2010	15.74	0.55	0.11	0.00
JM.KI	2020	16.10	0.57	0.12	0.00
JM.PO	2000	13.47	0.45	0.08	0.00
JM.PO	2010	15.74	0.55	0.11	0.00
JM.PO	2020	16.10	0.57	0.12	0.00
JM.SC	2000	13.47	0.45	0.08	0.00
JM.SC	2010	15.74	0.55	0.11	0.00
JM.SC	2020	16.10	0.57	0.12	0.00
JM.SD	2000	13.47	0.45	0.08	0.00
JM.SD	2010	15.74	0.55	0.11	0.00
JM.SD	2020	16.10	0.57	0.12	0.00
JM.ST	2000	13.47	0.45	0.08	0.00
JM.ST	2010	15.74	0.55	0.11	0.00
JM.ST	2020	16.10	0.57	0.12	0.00
MX01	2000	11.88	0.20	0.03	0.00
MX01	2010	11.04	0.18	0.03	0.00
MX01	2020	10.30	0.23	0.04	0.00
MX02	2000	7.33	0.17	0.06	0.01
MX02	2010	5.54	0.15	0.05	0.01
MX02	2020	6.75	0.19	0.09	0.02
MX03	2000	9.34	0.21	0.08	0.02
MX03	2010	8.36	0.18	0.07	0.02
MX03	2020	7.58	0.24	0.10	0.03
MX04	2000	15.31	0.49	0.22	0.03
MX04	2010	11.80	0.53	0.23	0.06
MX04	2020	15.41	0.57	0.27	0.07
MX05	2000	9.06	0.29	0.12	0.02
MX05	2010	8.29	0.27	0.12	0.02
MX05	2020	9.54	0.30	0.14	0.03
MX06	2000	16.10	0.43	0.14	0.00
MX06	2010	12.52	0.39	0.10	0.00
MX06	2020	11.39	0.44	0.17	0.00
MX07	2000	19.63	0.38	0.13	0.01
MX07	2010	15.77	0.39	0.14	0.02
MX07	2020	17.98	0.43	0.17	0.02
MX08	2000	6.43	0.32	0.13	0.03
MX08	2010	5.80	0.32	0.13	0.03
MX08	2020	5.79	0.35	0.16	0.05
MX09	2000	21.01	0.07	0.00	0.00
MX09	2010	20.28	0.07	0.00	0.00
MX09	2020	19.88	0.11	0.01	0.00
MX10	2000	8.18	0.37	0.15	0.02
MX10	2010	7.88	0.36	0.14	0.02
MX10	2020	7.99	0.39	0.17	0.03
MX11	2000	13.85	0.24	0.03	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
MX11	2010	13.35	0.22	0.04	0.00
MX11	2020	13.67	0.27	0.06	0.00
MX12	2000	19.39	0.43	0.17	0.01
MX12	2010	17.48	0.42	0.15	0.01
MX12	2020	19.56	0.47	0.20	0.02
MX13	2000	19.27	0.10	0.01	0.00
MX13	2010	18.54	0.10	0.01	0.00
MX13	2020	19.44	0.14	0.02	0.00
MX14	2000	13.38	0.29	0.05	0.00
MX14	2010	11.80	0.27	0.05	0.00
MX14	2020	11.96	0.32	0.08	0.00
MX15	2000	19.44	0.13	0.02	0.00
MX15	2010	18.66	0.12	0.02	0.00
MX15	2020	19.11	0.17	0.03	0.00
MX16	2000	14.92	0.29	0.05	0.00
MX16	2010	13.70	0.26	0.05	0.00
MX16	2020	14.22	0.31	0.08	0.00
MX17	2000	20.95	0.10	0.02	0.00
MX17	2010	20.32	0.10	0.02	0.00
MX17	2020	20.27	0.14	0.03	0.00
MX18	2000	11.98	0.44	0.14	0.00
MX18	2010	9.40	0.41	0.11	0.00
MX18	2020	8.73	0.45	0.16	0.00
MX19	2000	11.44	0.22	0.07	0.01
MX19	2010	10.16	0.21	0.07	0.01
MX19	2020	12.17	0.24	0.08	0.01
MX20	2000	16.31	0.35	0.12	0.01
MX20	2010	15.06	0.35	0.11	0.01
MX20	2020	17.15	0.40	0.15	0.02
MX21	2000	20.26	0.12	0.02	0.00
MX21	2010	19.21	0.12	0.03	0.00
MX21	2020	20.87	0.16	0.04	0.00
MX22	2000	13.23	0.17	0.02	0.00
MX22	2010	13.06	0.16	0.02	0.00
MX22	2020	13.80	0.21	0.04	0.00
MX23	2000	10.33	0.48	0.23	0.04
MX23	2010	9.57	0.53	0.23	0.04
MX23	2020	10.93	0.59	0.26	0.06
MX24	2000	11.80	0.19	0.03	0.00
MX24	2010	11.44	0.17	0.03	0.00
MX24	2020	11.18	0.22	0.05	0.00
MX25	2000	7.74	0.49	0.21	0.04
MX25	2010	7.35	0.48	0.19	0.04
MX25	2020	6.45	0.52	0.24	0.06
MX26	2000	5.34	0.36	0.18	0.06
MX26	2010	4.43	0.36	0.17	0.06
MX26	2020	4.81	0.39	0.20	0.09
MX27	2000	16.60	0.48	0.22	0.03
MX27	2010	12.37	0.51	0.22	0.05
MX27	2020	16.63	0.56	0.26	0.06

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
MX28	2000	11.41	0.23	0.07	0.01
MX28	2010	10.11	0.22	0.07	0.01
MX28	2020	11.82	0.25	0.08	0.01
MX29	2000	21.46	0.06	0.00	0.00
MX29	2010	20.21	0.06	0.00	0.00
MX29	2020	20.90	0.09	0.00	0.00
MX30	2000	18.18	0.20	0.06	0.01
MX30	2010	16.74	0.20	0.06	0.01
MX30	2020	20.40	0.24	0.07	0.01
MX31	2000	10.48	0.49	0.25	0.05
MX31	2010	9.35	0.52	0.24	0.05
MX31	2020	10.90	0.58	0.28	0.07
MX32	2000	9.90	0.25	0.07	0.01
MX32	2010	9.23	0.23	0.07	0.01
MX32	2020	9.35	0.27	0.09	0.01
NI05	2000	19.59	0.34	0.09	0.01
NI05	2010	22.86	0.36	0.12	0.01
NI05	2020	26.76	0.38	0.13	0.01
NI10	2000	16.80	0.43	0.16	0.01
NI10	2010	20.07	0.48	0.18	0.02
NI10	2020	21.63	0.48	0.20	0.02
NI20	2000	22.36	0.47	0.21	0.02
NI20	2010	24.50	0.51	0.22	0.03
NI20	2020	29.69	0.52	0.24	0.03
NI25	2000	21.29	0.52	0.22	0.02
NI25	2010	23.12	0.56	0.23	0.03
NI25	2020	27.76	0.58	0.25	0.04
NI30	2000	21.81	0.53	0.27	0.02
NI30	2010	24.34	0.57	0.27	0.04
NI30	2020	28.99	0.60	0.30	0.05
NI35	2000	21.29	0.52	0.22	0.02
NI35	2010	23.12	0.56	0.23	0.03
NI35	2020	27.76	0.58	0.25	0.04
NI40	2000	18.09	0.46	0.19	0.02
NI40	2010	20.56	0.51	0.20	0.03
NI40	2020	23.46	0.52	0.22	0.03
NI50	2000	15.56	0.45	0.19	0.02
NI50	2010	19.00	0.53	0.22	0.03
NI50	2020	19.45	0.53	0.22	0.03
NI55	2000	17.11	0.52	0.23	0.03
NI55	2010	19.19	0.60	0.24	0.04
NI55	2020	21.53	0.61	0.26	0.04
NI60	2000	16.35	0.50	0.20	0.02
NI60	2010	18.29	0.59	0.22	0.03
NI60	2020	20.43	0.60	0.24	0.03
NI65	2000	14.95	0.44	0.16	0.01
NI65	2010	18.24	0.53	0.19	0.02
NI65	2020	18.42	0.54	0.20	0.03
NI70	2000	16.35	0.50	0.20	0.02
NI70	2010	18.29	0.59	0.22	0.03

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
NI70	2020	20.43	0.60	0.24	0.03
NI80	2000	13.14	0.44	0.08	0.00
NI80	2010	14.50	0.57	0.13	0.00
NI80	2020	15.84	0.57	0.13	0.01
NI85	2000	12.58	0.38	0.07	0.00
NI85	2010	16.62	0.50	0.14	0.01
NI85	2020	13.23	0.51	0.14	0.01
NI91	2000	13.53	0.33	0.07	0.00
NI91	2010	18.59	0.37	0.12	0.00
NI91	2020	18.10	0.39	0.14	0.00
NI93	2000	14.09	0.40	0.13	0.01
NI93	2010	18.37	0.47	0.18	0.02
NI93	2020	17.43	0.47	0.18	0.02
PA01	2000	12.02	0.57	0.13	0.00
PA01	2010	13.59	0.60	0.15	0.00
PA01	2020	14.33	0.67	0.18	0.00
PA02	2000	12.02	0.57	0.13	0.00
PA02	2010	13.59	0.60	0.15	0.00
PA02	2020	14.33	0.67	0.18	0.00
PA04	2000	13.38	0.45	0.10	0.00
PA04	2010	15.02	0.53	0.15	0.00
PA04	2020	14.16	0.56	0.16	0.00
PA05	2000	13.84	0.54	0.14	0.00
PA05	2010	13.77	0.62	0.16	0.00
PA05	2020	13.38	0.66	0.19	0.00
PA06	2000	13.84	0.54	0.14	0.00
PA06	2010	13.77	0.62	0.16	0.00
PA06	2020	13.38	0.66	0.19	0.00
PA07	2000	12.31	0.64	0.15	0.00
PA07	2010	12.98	0.63	0.15	0.01
PA07	2020	12.32	0.72	0.18	0.01
PA08	2000	12.09	0.62	0.19	0.00
PA08	2010	12.84	0.67	0.19	0.01
PA08	2020	12.08	0.73	0.24	0.01
PA09	2000	13.32	0.46	0.10	0.00
PA09	2010	14.90	0.54	0.15	0.00
PA09	2020	14.07	0.57	0.16	0.00
PA10	2000	12.02	0.57	0.13	0.00
PA10	2010	13.59	0.60	0.15	0.00
PA10	2020	14.33	0.67	0.18	0.00
PA11	2000	13.38	0.45	0.10	0.00
PA11	2010	15.02	0.53	0.15	0.00
PA11	2020	14.16	0.56	0.16	0.00
PA12	2000	13.74	0.50	0.12	0.00
PA12	2010	14.31	0.58	0.16	0.00
PA12	2020	13.75	0.62	0.18	0.00
PA13	2000	12.31	0.64	0.15	0.00
PA13	2010	12.98	0.63	0.15	0.01
PA13	2020	12.32	0.72	0.18	0.01
PE01	2000	13.28	0.17	0.02	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
PE01	2010	20.55	0.21	0.03	0.00
PE01	2020	15.86	0.21	0.03	0.00
PE02	2000	12.81	0.07	0.00	0.00
PE02	2010	17.60	0.07	0.01	0.00
PE02	2020	16.10	0.09	0.01	0.00
PE03	2000	13.82	0.01	0.00	0.00
PE03	2010	20.35	0.02	0.00	0.00
PE03	2020	18.19	0.01	0.00	0.00
PE04	2000	11.93	0.04	0.00	0.00
PE04	2010	15.25	0.05	0.00	0.00
PE04	2020	13.46	0.06	0.00	0.00
PE05	2000	14.83	0.07	0.01	0.00
PE05	2010	20.96	0.07	0.01	0.00
PE05	2020	18.43	0.07	0.01	0.00
PE06	2000	13.49	0.20	0.05	0.00
PE06	2010	19.57	0.23	0.06	0.00
PE06	2020	15.68	0.24	0.08	0.01
PE08	2000	13.14	0.06	0.01	0.00
PE08	2010	21.40	0.08	0.01	0.00
PE08	2020	18.86	0.09	0.02	0.00
PE09	2000	15.29	0.08	0.00	0.00
PE09	2010	19.89	0.09	0.01	0.00
PE09	2020	19.57	0.10	0.01	0.00
PE10	2000	13.78	0.10	0.02	0.00
PE10	2010	20.78	0.11	0.02	0.00
PE10	2020	18.30	0.12	0.03	0.00
PE11	2000	14.69	0.12	0.01	0.00
PE11	2010	18.64	0.13	0.01	0.00
PE11	2020	18.91	0.13	0.01	0.00
PE12	2000	15.45	0.09	0.01	0.00
PE12	2010	20.68	0.10	0.01	0.00
PE12	2020	19.89	0.11	0.01	0.00
PE13	2000	12.87	0.11	0.01	0.00
PE13	2010	19.36	0.13	0.02	0.00
PE13	2020	15.98	0.13	0.02	0.00
PE14	2000	13.01	0.33	0.14	0.01
PE14	2010	16.27	0.34	0.14	0.02
PE14	2020	12.78	0.35	0.17	0.03
PE15	2000	15.82	0.08	0.00	0.00
PE15	2010	20.04	0.08	0.00	0.00
PE15	2020	19.66	0.10	0.01	0.00
PE16	2000	13.10	0.37	0.14	0.00
PE16	2010	21.43	0.47	0.19	0.01
PE16	2020	17.84	0.47	0.18	0.01
PE17	2000	11.71	0.12	0.04	0.00
PE17	2010	22.28	0.17	0.06	0.00
PE17	2020	19.44	0.19	0.07	0.01
PE18	2000	12.51	0.05	0.00	0.00
PE18	2010	15.39	0.07	0.00	0.00
PE18	2020	13.35	0.08	0.00	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
PE19	2000	15.43	0.12	0.02	0.00
PE19	2010	20.97	0.12	0.02	0.00
PE19	2020	19.35	0.14	0.02	0.00
PE20	2000	14.02	0.37	0.13	0.01
PE20	2010	17.49	0.37	0.15	0.01
PE20	2020	14.39	0.39	0.18	0.03
PE21	2000	13.13	0.03	0.00	0.00
PE21	2010	19.69	0.04	0.00	0.00
PE21	2020	17.01	0.05	0.01	0.00
PE22	2000	12.96	0.16	0.04	0.00
PE22	2010	21.05	0.20	0.06	0.00
PE22	2020	17.01	0.21	0.06	0.00
PE23	2000	13.30	0.07	0.00	0.00
PE23	2010	16.33	0.08	0.00	0.00
PE23	2020	13.50	0.09	0.01	0.00
PE25	2000	14.55	0.27	0.10	0.00
PE25	2010	23.06	0.34	0.13	0.01
PE25	2020	19.65	0.36	0.14	0.01
PY00	2000	15.08	0.32	0.16	0.03
PY00	2010	14.57	0.32	0.15	0.03
PY00	2020	26.21	0.37	0.19	0.05
PY01	2000	10.35	0.41	0.21	0.04
PY01	2010	15.27	0.42	0.20	0.05
PY01	2020	23.12	0.46	0.24	0.07
PY02	2000	13.66	0.35	0.17	0.03
PY02	2010	14.81	0.34	0.16	0.03
PY02	2020	23.14	0.39	0.20	0.05
PY03	2000	14.66	0.34	0.17	0.03
PY03	2010	15.02	0.33	0.15	0.03
PY03	2020	23.68	0.38	0.19	0.05
PY04	2000	14.31	0.34	0.17	0.03
PY04	2010	14.73	0.33	0.15	0.03
PY04	2020	23.05	0.38	0.19	0.05
PY05	2000	13.43	0.34	0.17	0.03
PY05	2010	14.41	0.33	0.15	0.03
PY05	2020	22.27	0.38	0.19	0.05
PY06	2000	14.14	0.34	0.17	0.03
PY06	2010	14.60	0.33	0.15	0.03
PY06	2020	22.83	0.38	0.19	0.05
PY07	2000	10.82	0.29	0.13	0.02
PY07	2010	12.18	0.29	0.12	0.01
PY07	2020	17.22	0.33	0.16	0.03
PY08	2000	12.75	0.27	0.12	0.02
PY08	2010	11.25	0.28	0.12	0.02
PY08	2020	20.44	0.33	0.16	0.04
PY09	2000	14.59	0.33	0.16	0.03
PY09	2010	14.74	0.33	0.15	0.03
PY09	2020	23.56	0.38	0.19	0.05
PY10	2000	10.59	0.33	0.16	0.02
PY10	2010	12.82	0.32	0.15	0.02

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
PY10	2020	18.27	0.37	0.19	0.04
PY11	2000	13.70	0.30	0.14	0.02
PY11	2010	12.31	0.30	0.13	0.03
PY11	2020	23.65	0.35	0.17	0.04
PY12	2000	12.82	0.27	0.12	0.02
PY12	2010	11.36	0.28	0.12	0.02
PY12	2020	20.80	0.33	0.16	0.04
PY13	2000	9.38	0.39	0.20	0.03
PY13	2010	14.84	0.40	0.19	0.04
PY13	2020	20.87	0.44	0.24	0.06
PY14	2000	9.04	0.37	0.19	0.03
PY14	2010	13.38	0.37	0.17	0.03
PY14	2020	19.09	0.41	0.22	0.05
PY15	2000	12.15	0.35	0.17	0.04
PY15	2010	15.88	0.36	0.17	0.05
PY15	2020	26.27	0.42	0.21	0.07
PY16	2000	10.59	0.31	0.14	0.03
PY16	2010	20.87	0.34	0.16	0.04
PY16	2020	22.41	0.40	0.19	0.06
PY17	2000	12.01	0.40	0.20	0.04
PY17	2010	20.68	0.42	0.21	0.06
PY17	2020	25.65	0.49	0.25	0.09
SR01	2000	10.14	0.48	0.22	0.00
SR01	2010	14.62	0.61	0.28	0.01
SR01	2020	11.96	0.57	0.26	0.01
SR05	2000	10.07	0.49	0.22	0.00
SR05	2010	17.55	0.63	0.29	0.01
SR05	2020	13.37	0.58	0.28	0.01
SR06	2000	10.16	0.48	0.22	0.00
SR06	2010	14.61	0.61	0.28	0.01
SR06	2020	11.97	0.57	0.26	0.01
SR09	2000	8.80	0.46	0.21	0.00
SR09	2010	16.47	0.57	0.26	0.01
SR09	2020	13.12	0.54	0.26	0.01
SV01	2000	22.22	0.28	0.05	0.00
SV01	2010	26.65	0.31	0.07	0.00
SV01	2020	26.90	0.33	0.09	0.00
SV02	2000	24.04	0.44	0.15	0.00
SV02	2010	30.34	0.45	0.17	0.01
SV02	2020	34.20	0.49	0.20	0.01
SV03	2000	23.11	0.36	0.10	0.00
SV03	2010	28.38	0.37	0.11	0.00
SV03	2020	30.33	0.40	0.14	0.00
SV04	2000	23.41	0.37	0.11	0.00
SV04	2010	28.13	0.38	0.12	0.00
SV04	2020	28.97	0.42	0.14	0.00
SV05	2000	22.24	0.28	0.05	0.00
SV05	2010	26.68	0.31	0.07	0.00
SV05	2020	26.90	0.33	0.09	0.00
SV06	2000	25.21	0.53	0.19	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
SV06	2010	30.69	0.54	0.20	0.01
SV06	2020	32.58	0.59	0.25	0.01
SV07	2000	24.20	0.53	0.24	0.01
SV07	2010	28.89	0.54	0.23	0.02
SV07	2020	31.73	0.59	0.27	0.02
SV08	2000	24.20	0.53	0.24	0.01
SV08	2010	28.89	0.54	0.23	0.02
SV08	2020	31.73	0.59	0.27	0.02
SV09	2000	25.28	0.52	0.19	0.00
SV09	2010	30.76	0.52	0.20	0.01
SV09	2020	32.65	0.57	0.24	0.01
SV10	2000	23.41	0.37	0.11	0.00
SV10	2010	28.13	0.38	0.12	0.00
SV10	2020	28.97	0.42	0.14	0.00
SV11	2000	25.28	0.52	0.19	0.00
SV11	2010	30.76	0.52	0.20	0.01
SV11	2020	32.65	0.57	0.24	0.01
SV12	2000	22.24	0.28	0.05	0.00
SV12	2010	26.68	0.31	0.07	0.00
SV12	2020	26.90	0.33	0.09	0.00
SV13	2000	24.01	0.79	0.22	0.00
SV13	2010	29.61	0.77	0.22	0.00
SV13	2020	31.52	0.87	0.29	0.00
SV14	2000	25.28	0.52	0.19	0.00
SV14	2010	30.76	0.52	0.20	0.01
SV14	2020	32.65	0.57	0.24	0.01
UY01	2000	9.10	0.18	0.07	0.01
UY01	2010	8.11	0.19	0.07	0.01
UY01	2020	8.67	0.21	0.08	0.01
UY02	2000	11.82	0.12	0.04	0.00
UY02	2010	10.72	0.13	0.04	0.00
UY02	2020	10.19	0.14	0.04	0.00
UY03	2000	9.18	0.15	0.05	0.00
UY03	2010	8.57	0.16	0.05	0.00
UY03	2020	8.49	0.16	0.05	0.00
UY04	2000	12.51	0.12	0.03	0.00
UY04	2010	11.38	0.13	0.03	0.00
UY04	2020	11.92	0.14	0.04	0.00
UY05	2000	11.04	0.16	0.06	0.01
UY05	2010	9.68	0.17	0.06	0.00
UY05	2020	10.26	0.18	0.06	0.00
UY06	2000	11.75	0.15	0.06	0.00
UY06	2010	10.33	0.16	0.05	0.00
UY06	2020	11.11	0.17	0.06	0.00
UY07	2000	11.78	0.12	0.04	0.00
UY07	2010	10.68	0.13	0.04	0.00
UY07	2020	10.17	0.14	0.04	0.00
UY08	2000	11.58	0.13	0.04	0.00
UY08	2010	10.57	0.13	0.04	0.00
UY08	2020	9.90	0.14	0.04	0.00

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
UY09	2000	11.61	0.12	0.04	0.00
UY09	2010	10.60	0.13	0.04	0.00
UY09	2020	9.91	0.14	0.04	0.00
UY10	2000	11.97	0.11	0.03	0.00
UY10	2010	11.01	0.12	0.03	0.00
UY10	2020	10.42	0.12	0.04	0.00
UY11	2000	10.24	0.18	0.06	0.01
UY11	2010	8.84	0.18	0.07	0.00
UY11	2020	9.52	0.20	0.08	0.01
UY12	2000	11.24	0.17	0.06	0.01
UY12	2010	9.83	0.17	0.06	0.00
UY12	2020	10.65	0.19	0.07	0.00
UY13	2000	9.07	0.16	0.06	0.01
UY13	2010	8.20	0.17	0.06	0.00
UY13	2020	8.29	0.18	0.06	0.00
UY14	2000	10.27	0.11	0.03	0.00
UY14	2010	9.77	0.11	0.03	0.00
UY14	2020	8.74	0.11	0.03	0.00
UY15	2000	9.62	0.18	0.07	0.01
UY15	2010	8.35	0.19	0.08	0.00
UY15	2020	9.08	0.21	0.08	0.01
UY16	2000	12.51	0.11	0.03	0.00
UY16	2010	11.38	0.12	0.03	0.00
UY16	2020	11.85	0.13	0.04	0.00
UY17	2000	11.35	0.16	0.06	0.01
UY17	2010	9.92	0.17	0.06	0.00
UY17	2020	10.76	0.19	0.07	0.00
UY18	2000	9.24	0.16	0.06	0.01
UY18	2010	8.22	0.17	0.06	0.00
UY18	2020	8.33	0.18	0.07	0.01
UY19	2000	9.66	0.14	0.04	0.00
UY19	2010	8.91	0.14	0.04	0.00
UY19	2020	8.61	0.15	0.04	0.00
VE02	2000	10.56	0.53	0.25	0.01
VE02	2010	17.79	0.65	0.29	0.04
VE02	2020	15.44	0.67	0.32	0.05
VE03	2000	11.08	0.41	0.16	0.01
VE03	2010	16.64	0.57	0.22	0.03
VE03	2020	12.08	0.52	0.22	0.03
VE04	2000	12.62	0.35	0.14	0.01
VE04	2010	23.58	0.45	0.17	0.03
VE04	2020	17.88	0.46	0.20	0.04
VE05	2000	14.65	0.54	0.27	0.03
VE05	2010	24.31	0.65	0.31	0.06
VE05	2020	20.16	0.64	0.33	0.08
VE06	2000	13.26	0.34	0.13	0.01
VE06	2010	23.23	0.43	0.16	0.02
VE06	2020	18.07	0.44	0.18	0.03
VE07	2000	10.91	0.50	0.22	0.01
VE07	2010	19.09	0.63	0.29	0.04

ADMIN1	Year	Mean PM 2.5	time > 26°	time > 32°	time > 38°
VE07	2020	13.47	0.59	0.29	0.04
VE08	2000	13.04	0.43	0.16	0.01
VE08	2010	22.36	0.53	0.23	0.03
VE08	2020	17.52	0.52	0.25	0.04
VE09	2000	13.21	0.45	0.18	0.01
VE09	2010	22.49	0.55	0.24	0.03
VE09	2020	17.39	0.55	0.27	0.05
VE10	2000	10.98	0.46	0.18	0.01
VE10	2010	16.41	0.60	0.27	0.03
VE10	2020	11.86	0.55	0.26	0.02
VE11	2000	12.65	0.54	0.20	0.03
VE11	2010	17.57	0.66	0.27	0.04
VE11	2020	15.83	0.65	0.28	0.07
VE12	2000	14.33	0.56	0.28	0.03
VE12	2010	23.51	0.70	0.33	0.07
VE12	2020	16.81	0.69	0.35	0.09
VE13	2000	12.66	0.52	0.20	0.03
VE13	2010	19.92	0.63	0.26	0.04
VE13	2020	17.29	0.63	0.28	0.06
VE14	2000	13.34	0.30	0.09	0.01
VE14	2010	23.12	0.37	0.13	0.01
VE14	2020	18.76	0.37	0.14	0.02
VE15	2000	15.03	0.49	0.25	0.02
VE15	2010	21.78	0.60	0.29	0.05
VE15	2020	18.19	0.58	0.31	0.06
VE16	2000	10.83	0.43	0.16	0.01
VE16	2010	15.56	0.57	0.23	0.03
VE16	2020	11.43	0.52	0.22	0.02
VE17	2000	9.23	0.32	0.04	0.00
VE17	2010	10.02	0.53	0.11	0.00
VE17	2020	8.54	0.45	0.09	0.00
VE18	2000	12.85	0.40	0.15	0.01
VE18	2010	23.05	0.48	0.19	0.02
VE18	2020	18.25	0.48	0.21	0.03
VE19	2000	9.23	0.32	0.04	0.00
VE19	2010	10.02	0.53	0.11	0.00
VE19	2020	8.54	0.45	0.09	0.00
VE20	2000	13.48	0.35	0.13	0.01
VE20	2010	23.08	0.42	0.15	0.02
VE20	2020	19.08	0.43	0.18	0.03
VE21	2000	12.72	0.54	0.20	0.03
VE21	2010	19.37	0.65	0.25	0.04
VE21	2020	17.73	0.65	0.27	0.07
VE22	2000	12.20	0.40	0.15	0.01
VE22	2010	21.44	0.48	0.21	0.02
VE22	2020	16.98	0.49	0.23	0.03
VE23	2000	13.84	0.58	0.23	0.04
VE23	2010	17.93	0.69	0.27	0.05
VE23	2020	17.01	0.68	0.30	0.08