

*IUSSP Webinar:*

# **Quantifying COVID-19-related excess mortality in Latin America: Demographic analyses of death registration data in Latin America**

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Everton Lima  
**University of Campinas, Brazil**




## ❑ **Research in collaboration with:**

Estevão Vilela (UFMG), Andrés Peralta (CEAD), Marília G. Rocha (Unicamp), Bernardo L. Queiroz (UFMG), Mario Piscoya Díaz (UFG), Marcos R. Gonzaga (UFRN), Flávio H. M. A. Freire (UFRN) and Victor Guerrero (Colmex).

- ❑ **Context of Covid-19 pandemic in Lat. America**
- ❑ **Why study excess mortality?**
- ❑ **Countries analyzed**
- ❑ **Data sources and methods used**
- ❑ **Main findings**
- ❑ **Discussion**

# Why study excess mortality?

## Importance of studying excess mortality

-  Good data on Covid-19 deaths are not readily available;
-  Possible issues with causes of death recording and time-frame;
-  Looking at overall mortality for some specific areas in different points of time provides useful information to public health planning.

## ❑ Importance of studying excess mortality

- ❑ To answer the question: *what number of deaths would we have seen in Sars-Cov-2 (Covid-19) absence ?*
- ❑ Look at ***excess of overall mortality***, i.e. the number of deaths from previous years compared to the current year;
- ❑ We can compare the ratio of death in year X to year X-1 or a longer time trend.

- ❏ **Importance of studying excess mortality**
- ❏ Available information on news outlets and MPIDR:
- ❏ <https://mpidr.shinyapps.io/stmortality/>
- ❏ <https://www.economist.com/graphic-detail/2020/04/16/tracking-covid-19-excess-deaths-across-countries>
- ❏ <https://www.bbc.com/news/world-53073046>
- ❏ [http://www.princeton.edu/~fujiwara/papers/excess\\_deaths.pdf](http://www.princeton.edu/~fujiwara/papers/excess_deaths.pdf)






- ❑ **Importance of studying excess mortality**
- ❑ There is also a lot of misinformation: *zero excess mortality in June?*



The screenshot shows the header of the website 'Revista Oeste' with a navigation menu including 'REVISTA OESTE', 'COLUNISTAS', 'POLÍTICA', 'ECONOMIA', 'MUNDO', 'INTERNET', and 'SOBRE OESTE'. The main article is titled 'Pandemia em declínio: Brasil zerou excesso de mortes em junho' by Paula Leal, dated July 8, 2020. The article is categorized under 'CORONAVÍRUS | SAÚDE | VOCÊ NÃO PODE PERDER'.



## Importance of studying excess mortality

-  Not all of the excess mortality occurred due to Covid-19, but this disease will affect mortality levels in 4 different ways (as discussed by Noymer and HELLERINGER):
  -  Direct (the actual Covid deaths);
  -  Direct-Indirect: deaths that were Covid, but not registered as Covid;
  -  Indirect: deaths by other causes that happened because the health care system was affected by the pandemic;
  -  Now COVID is a competing risk.

- ❑ **Context of Covid-19 pandemic in Lat. America**
- ❑ Latin America is now the epicenter of the disease;
- ❑ The mortality data for Covid-19 pandemic is underreported (Torres and Sacoto 2020; Croda et al 2020);
- ❑ Latin America has one of the lowest test rates in the world;
- ❑ Delays between the Covid-19 tests and the time that their results are released.



# Countries Analyzed

- ❑ **Countries analyzed: Brazil, Chile, Ecuador and Peru**
- ❑ In Brazil, President primarily regards the virus as “**just a little dose of flu**”;
- ❑ In Peru, even with the imposed lockdown, which started in march 15th, it was observed a fast growing number of deaths by COVID-19.

## ❏ Countries analyzed

- ❏ Ecuador, mortality explosion in the months of march and april occurred primarily in coastal provinces. But, epidemic hotspots have gradually moved to rest of the country;
- ❏ Instead of a full quarantine, as an initial strategy, Chile adopted a high number of daily tests, together with local and dynamic quarantines.

## ❏ Countries analyzed

- ❏ In none of the four countries the strategies, adopted to tackle this disease spread, seem to work;
- ❏ As results, the numbers of infected has substantially increased;
- ❏ How to measure its impact on mortality level? Looking at excess mortality in 2020 relative to previous years.



# Data and Methods

## ❑ Data sources and methods used

- ❑ Brazilian Civil Registry Offices on the 'Transparency Portal - Civil Registry', <https://transparencia.registrocivil.org.br/registral-covid>
- ❑ Collected through data scraping.
- ❑ For Ecuador, we use monthly death counts from the Civil Registry for the years 2018-2020, available at <https://www.registrocivil.gob.ec/cifras/>



## ❏ Data sources and methods used

- ❏ Peruvian death data is registered by Ministry of Health, and it is available in <https://www.minsa.gob.pe/defunciones/>
- ❏ The case of Chile, the death counts data was compiled through data scraping from web page "the tableau public", <https://public.tableau.com/profile/deis4231#!/vizhome/HechosVitalesdesdeel2000/NotaTcnica?publish=yes>

## ❏ **Data sources and methods used**

- ❏ We look at mortality levels from March to May in all countries (Total deaths) from 2020 and 2019 (2018);
- ❏ Analysis in small areas of each country;
- ❏ We estimate measures as average deaths, coefficient of variation, and percentages differences in total deaths between the periods.

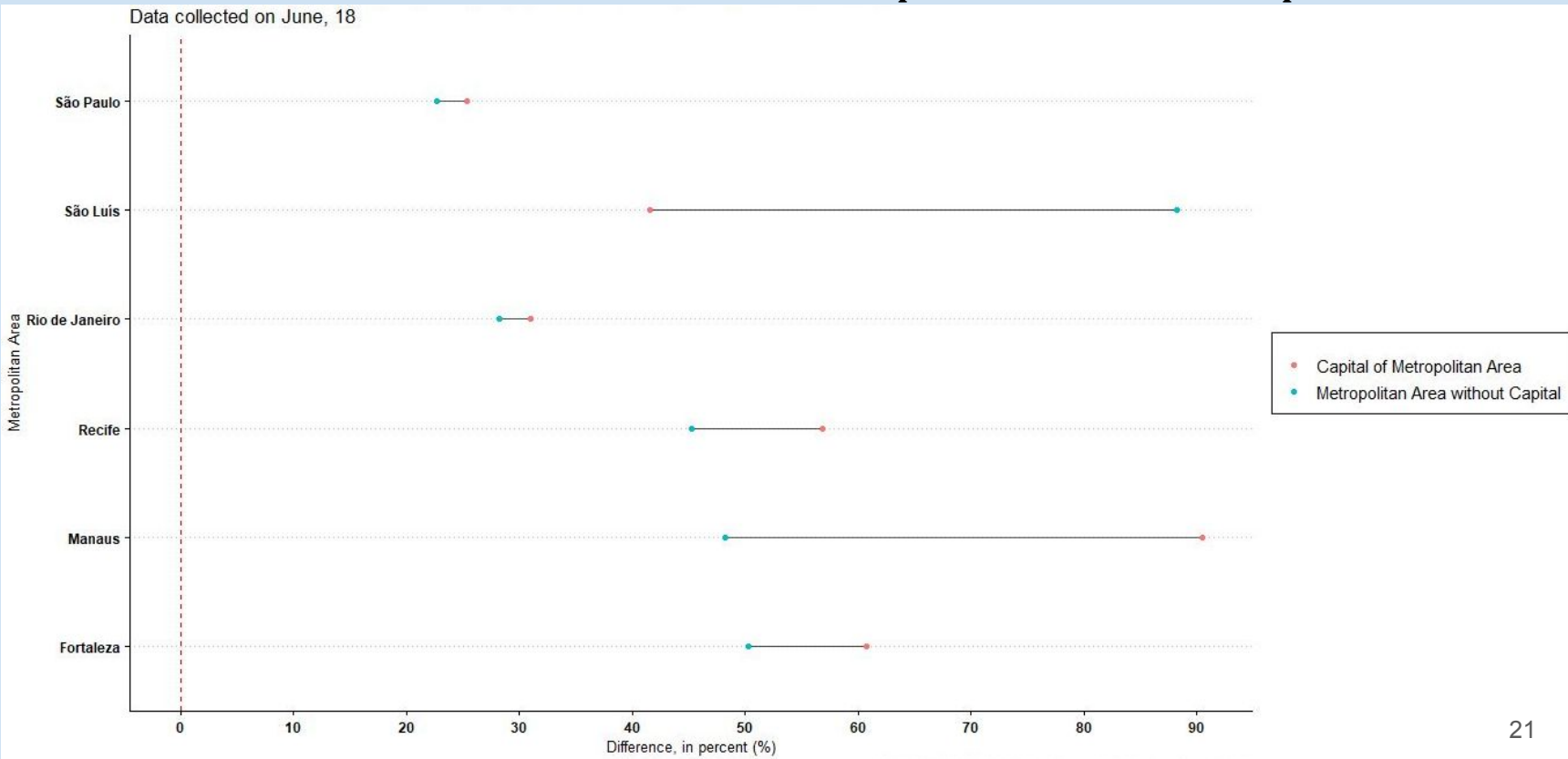
## ❑ **Data sources and methods used**

- ❑ We are aware of limitation with quality of death;
  - ❑ Possible issues: under-reporting, delays in reporting, regional variation in quality of information;
- ❑ We did not applied any adjustment to the data.

# Main Findings: Brazil



# Difference, in percent, between the number of deaths registered in 2020 compared to 2019 in the months March to May. Metropolitan Areas and Metropolitan Areas without Capital.



Source: <https://transparencia.registrocivil.org.br/registros>



# Differences and average deaths and coefficients of variation in selected cities of Brazil. Overall mortality between 2019 and 2020, months March to May.




Differences in average deaths - March to May, comparing years 2019 to 2020



Differences in coefficient of variation of deaths - March to May, comparing years 2019 to 2020



## Results for Brazil

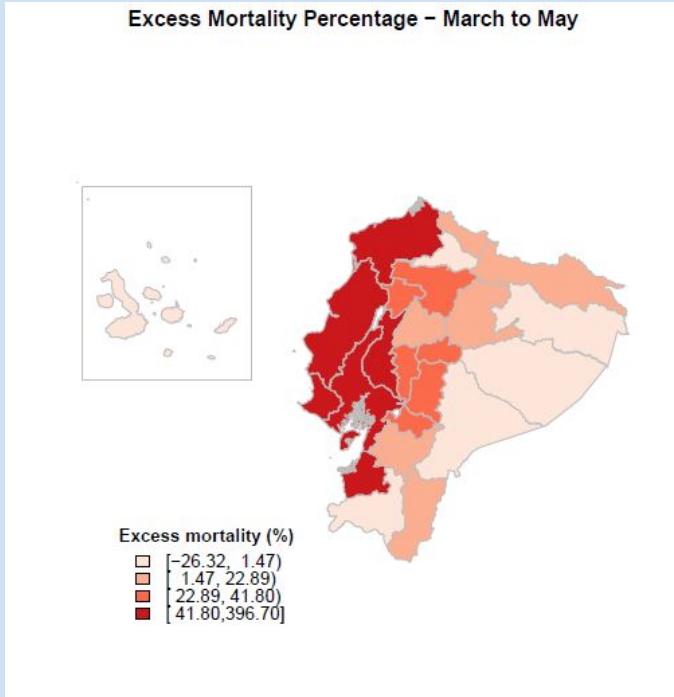
-  Brazil: First, average mortality was higher in major cities of the country (São Paulo and Rio de Janeiro);
-  Coefficient of variation shows more heterogeneity of deaths in cities located in the North and Northeast of Brazil;
-  Increase death numbers in other cities, indication of deaths moving to inland of the country.



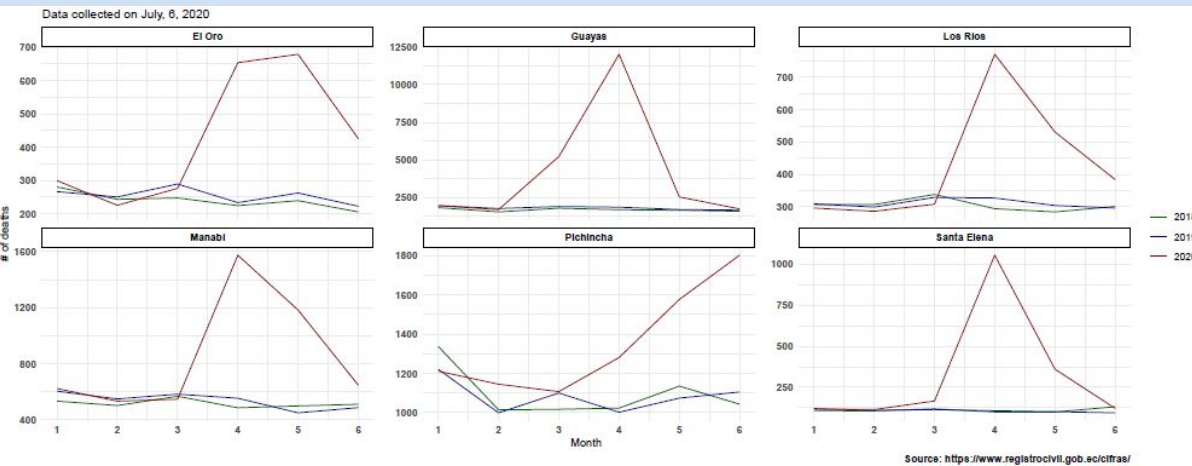
## **Main Findings: Ecuador**



# Differences in percentages of deaths in the provinces of Ecuador. Overall mortality in 2020 in relation to 2018, months March to May.



## Temporal evolution of excess mortality in the selected provinces of Ecuador, Jan-June, 2018 to 2020.



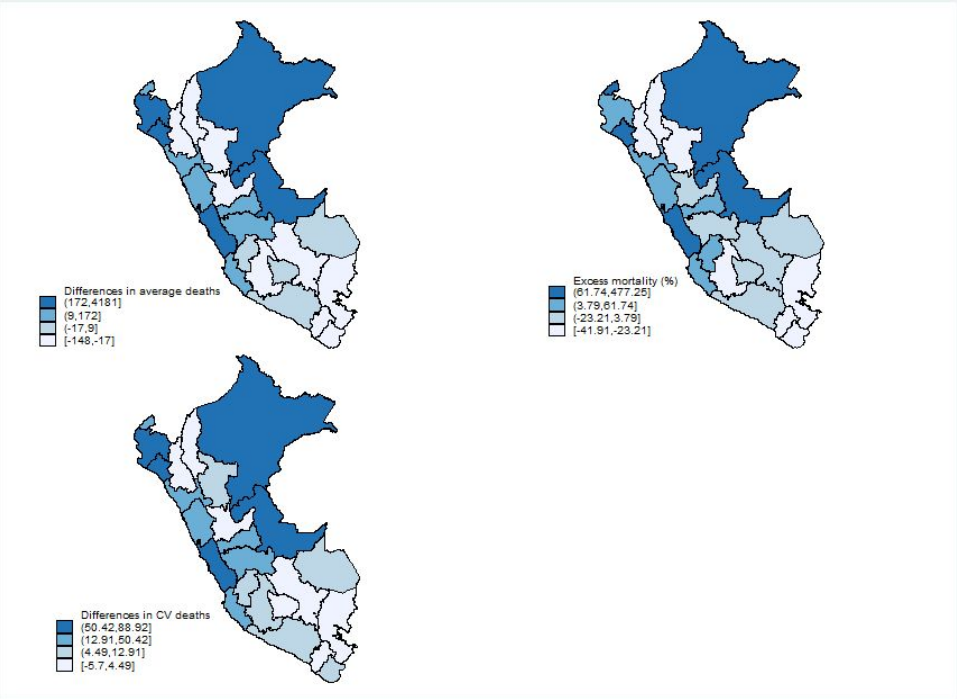
## ❏ **Results for Ecuador**

- ❏ Ecuador: we also see the effects of excess of deaths, especially in the region of Guayas (port of Guayaquil);
- ❏ The department of Pichincha (country's capital Quito is located) has also show substantial deaths increase in the last months (second phase of the disease spread?)

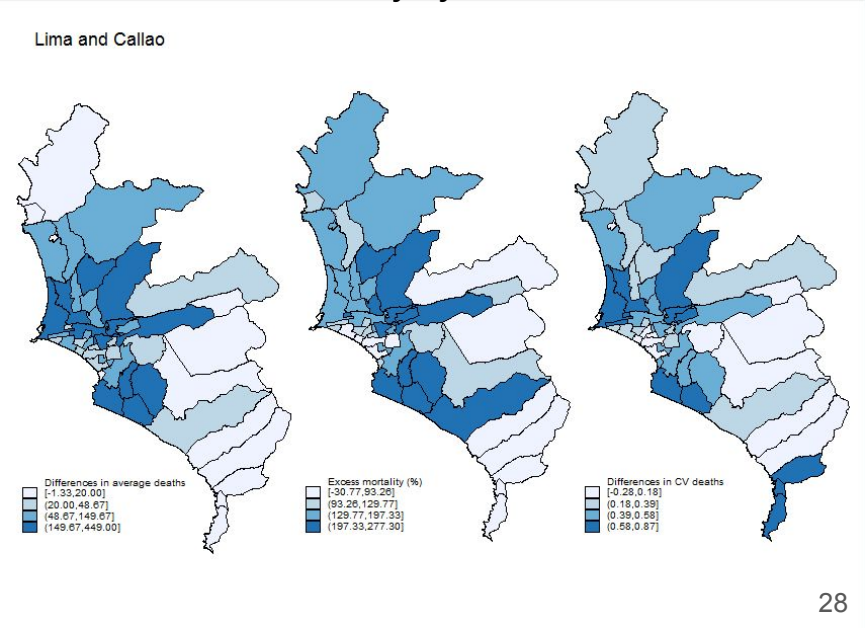
# Main Findings: Peru



**Differences in mortality in Peru between 2019 e 2020 Comparison of observed total deaths occurred in March - May by region.**



**Differences in mortality in Lima and Callao between 2019 e 2020 Comparison of observed total deaths occurred in March - May by district.**



## ❏ Results for Peru

- ❏ Peru: The overall percentage variation is 63.5% more mortality in 2020 than in 2019, for the entire country;
- ❏ The number of excess deaths is not uniform spread across Peru;
- ❏ More disaggregated analysis, show the lesser developed districts of Lima are the most affected by mortality increase.

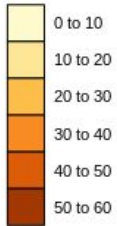
# Main Findings: Chile



**Differences and average deaths  
and coefficients of variation in  
selected comunas of Chile.  
Overall mortality between 2019  
and 2020, months March to May.**

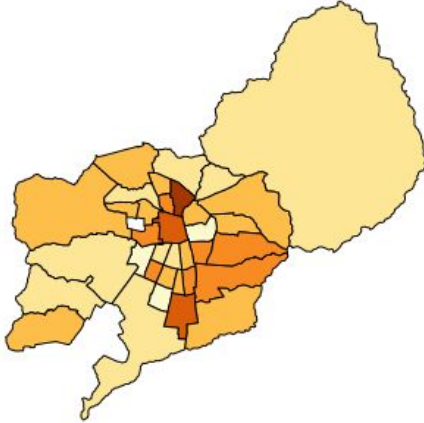
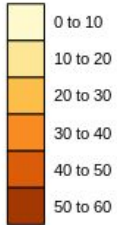
Differences in average deaths - March to May, comparing years 2019 to 2020

Differences in average deaths



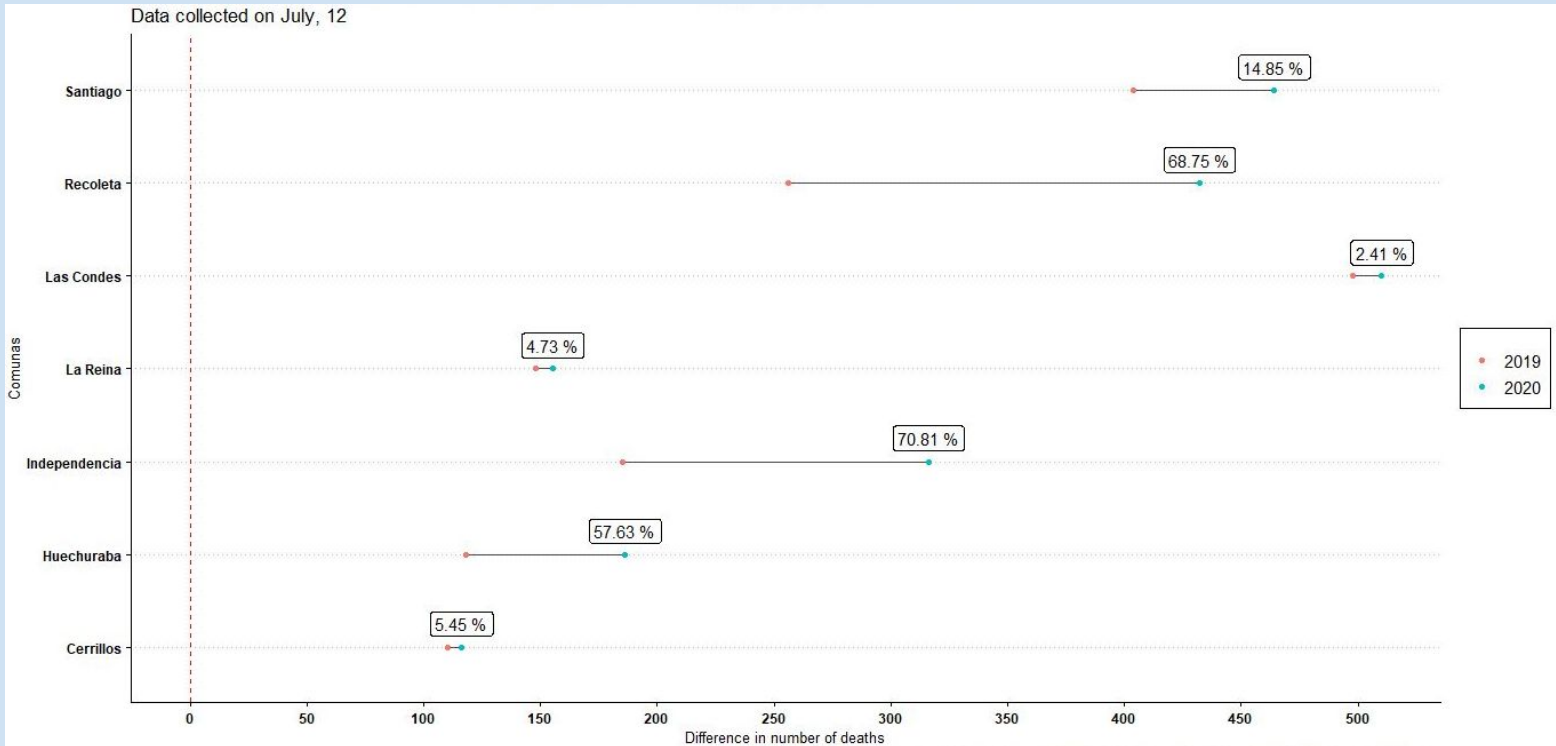
Differences in coefficient of variation of deaths - March to May, comparing years 2019 to 2020

Differences in CV deaths







## Difference, in percent, between the number of deaths registered in 2020 compared to 2019 in the months March to May. Selected comunas of Chile.



Source: <https://public.tableau.com/profile/deis4231#/vizhome/HechosVitalesdesdesdeel2000/NotaTcnica?publish=yes>



## Results for Chile

-  Chile: excess mortality is observed in major comunas (Santiago and surroundings);
-  At the same time, a spatial cluster of excess deaths is also observed in areas more distant from the country's capital.




# Discussion

## Discussion

- ❑ Increase mortality is observed in almost all countries of the region (certain cases more than 200% excess mortality);
- ❑ It started in more developed and urbanized regions of all countries, but gradually moved to inland;
- ❑ Affecting less developed areas (second phase of the pandemic?)

## Discussion

-  Add more countries to our analysis - we already are working with data from Mexico. In the case of Brazil, as pandemic progress we are adding more regions and update death information.

# Thank you/Obrigado/Gracias/Merci

## Pre-Print available here:

<https://osf.io/xhkp4>

A screenshot of the OSF Preprints website. The header includes the OSF logo and the text 'OSF PREPRINTS' with a dropdown arrow. To the right are links for 'Add a Preprint', 'Search', 'Support', and 'Donate'. The main content area features the title 'Exploring excess mortality in Latin America in the context of covid pandemic: the cases of Brazil and Ecuador'. Below the title, it lists the authors: 'Everton Lima, Estevão Vilela, Andrés Peralta, Marília Rocha, Bernardo Queiroz, Marcos R Gonzága, Flávio Freire'. At the bottom, there are two dropdown menus: 'AUTHOR ASSERTIONS' with 'Conflict of Interest: No' and 'Public Data: Available'.

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AUTHORS  
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