

# Exhibit 547

Quantitative evaluation of whether the Nobel-Prize-winning COVID-19 vaccine actually saved millions of lives.

<https://correlation-canada.org/nobel-vaccine-and-all-cause-mortality/>

# Quantitative evaluation of whether the Nobel-Prize-winning COVID-19 vaccine actually saved millions of lives

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## 1 Abstract

Fantastic statements that the Nobel-Prize-winning COVID-19 vaccines saved millions (and tens of millions) of lives are based on the theoretical scenarios of Watson et al. (2022), published in *The Lancet Infectious Diseases*. Watson et al. (2022) theoretically inferred massive mortality reductions distributed globally, occurring solely during

vaccine rollouts. We calculated the quantitative consequences of Watson et al. (2022)'s low-value (14.4 million lives saved) theoretical scenario on all-cause mortality by time (by week or by month, 2020-2022) in 95 countries. Our calculations provide graphical proof that the theoretical proposals of Watson et al. (2022) are untenable, compared to measured all-cause mortality. Therefore, the characteristics of the COVID-19 vaccines (efficacies in preventing infection or serious illness, duration of protection, waning, etc.) and of COVID-19 spread input by Watson et al. (2022) must be invalid.

## 2 Context and Motivation

Leading legacy media have, in the last few days, asserted that the COVID-19 vaccine for which the 2023 Nobel prize in medicine was awarded saved “millions” and “tens of millions” of lives:

*New York Times*

“Their work enabled potent Covid vaccines to be made in less than a year, averting tens of millions of deaths and helping the world recover from the worst pandemic in a century.” (2023-10-02)

<https://www.nytimes.com/2023/10/02/health/nobel-prize-medicine.html>

*The Washington Post*

“It is the backbone of coronavirus vaccines that were developed in record time, providing a crucial shield of protection that helped save millions of lives and allowed people to reunite safely with loved ones.” (2023-10-02)

<https://www.washingtonpost.com/science/2023/10/02/nobel-prize-medicine/>

*CBC*

“MRNA vaccines, together with other COVID-19 vaccines, have been administered over 13 billion times. Together they have saved millions of lives, prevented severe COVID-19, reduced the overall disease burden and enabled societies to open up again,” said Thomas Perlmann, member of the Nobel Assembly at the Karolinska Institute.” (2023-10-02)

<https://www.cbc.ca/news/health/nobel-prize-medicine-1.6984244>

*CNN*

“Rickard Sandberg, a member of the Nobel Prize in medicine committee, said, ‘mRNA vaccines together with other Covid-19 vaccines have been administered over 13 billion times. Together they have saved millions of lives, prevented severe Covid-19, reduced the overall disease burden and enabled societies to open up again.’” (2023-10-02)

<https://www.cnn.com/2023/10/02/europe/nobel-prize-medicine-mrna-covid-vaccines-2023-intl-scn/index.html>

*Reuters*

“Pair lauded for helping save millions of lives” (2023-10-02)

<https://www.reuters.com/business/healthcare-pharmaceuticals/kariko-weissman-win-medicine-nobel-covid-19-vaccine-work-2023-10-02/>

*Associated Press*

“Dr. Paul Hunter, a professor of medicine at Britain’s University of East Anglia, described the mRNA vaccines made by BioNTech-Pfizer and Moderna Inc. as a ‘game changer’ in shutting down the coronavirus pandemic, crediting the shots with saving millions of lives.” (2023-10-02)

<https://apnews.com/article/nobel-prize-medicine-71306bd18785477f3a85a69caa6e09c9>

*Science News*

“In the year after their introduction, the shots are estimated to have saved nearly 20 million lives globally [citing Watson et al., 2022].” (2023-10-02)

<https://www.sciencenews.org/article/nobel-prize-physiology-medicine-2023-mrna-vaccine-covid>

*The Nobel Prize*

(Press Release, 2023-10-02)

“The vaccines have saved millions of lives and prevented severe disease in many more, allowing societies to open and return to normal conditions.”

<https://www.nobelprize.org/prizes/medicine/2023/press-release/>

To our knowledge: There is no known controlled randomized clinical trial with complete data demonstrating that the COVID-19 vaccines cause deaths to be averted. There is



no controlled study showing that the COVID-19 vaccines save lives of individuals representative of any population or fragile group.

The Nobel Prize committee's impressions and aligned media assertions are based on the modelling scenarios ("[Global impact of the first year of COVID-19 vaccination: a mathematical modelling study](#)") reported by Watson et al. (2022) and published in the influential medical journal *The Lancet Infectious Diseases*.

In the abstract of their paper (which has been cited in scientific sources [more than 700 times](#) to date), Watson et al. (2022) state:

(Findings) Based on official reported COVID-19 deaths, we estimated that vaccinations prevented 14.4 million (95% credible interval [CrI] 13.7–15.9) deaths from COVID-19 in 185 countries and territories between Dec 8, 2020, and Dec 8, 2021. This estimate rose to 19.8 million (95% CrI 19.1–20.4) deaths from COVID-19 averted when we used excess deaths as an estimate of the true extent of the pandemic, ...

(Interpretation) COVID-19 vaccination has substantially altered the course of the pandemic, saving tens of millions of lives globally. ...

(Funding) Schmidt Science Fellowship in partnership with the Rhodes Trust; WHO; UK Medical Research Council; Gavi, the Vaccine Alliance; Bill & Melinda Gates Foundation; National Institute for Health Research; and Community Jameel.

Here, we calculate the quantitative consequence of Watson et al.'s theoretical narrative on all-cause mortality by time in 95 countries to show that their results and the associated fantastic claims of millions of lives saved are highly improbable. Our calculations allow graphical demonstrations that the theoretical narrative of Watson et al. has no connection to actual mortality.

### 3 Data and Methods

The sources of the all-cause mortality and vaccination data by time are the same as in Rancourt et al. (2023) (their Figure 2).

The calculated all-cause mortality (or its excess) that corresponds to Watson et al. (2022)'s low-value scenario (14.4 million deaths prevented by COVID-19 vaccination in 185 countries, between 8 December 2020 and 8 December 2021), for each of 95 countries, is obtained as follows. Watson et al. (2022) provide individual evaluations for each of their 185 countries.

In general, in mathematical terms, the number of deaths averted (the outcome) is a convolution in time between vaccine administration (the intervention) and vaccine efficiency (including population susceptibility to infection) (the response).

Protection from COVID-19 vaccination (vaccine efficiency) is assumed, by Watson et al. (2022), to be imperfect and of limited duration. They take it to be modelled by an Erlang distribution. For simplicity, we apply a zero-to-constant rectangular response function of 180-day width, delayed by 14 days. These values are representative of mean (zero-to-constant) protection duration and delay of onset of maximum immunity, respectively. Our results are insensitive to these choices.

We thereby calculate the number of lives saved by time increment (week or month) and normalize the result to the number of lives saved reported for Watson et al. (2022)'s low-value scenario, between 8 December 2020 and 8 December 2021, for each of 95 countries.

In this way, we obtain the all-cause mortality by time that corresponds to the low-value scenario of Watson et al. (2022), for each of 95 countries. In other words, we calculate what total all-cause mortality would have been if the work of Watson et al. (2022) was a correct representation of reality and no COVID-19 vaccines were administered.

Likewise, we also express the results as excess all-cause mortality by time (week or month), for each of 95 countries.

Excess all-cause mortality by time (week or month) and its one-standard-deviation uncertainty are calculated as follows.

The excess all-cause mortality at a given time (week or month) is the difference (positive or negative) between the reported all-cause mortality for the given time and the expected all-cause mortality for the given time, which is ascertained from the historic all-cause mortality in a reference period immediately preceding the Covid period (prior to the 11 March 2020 World Health Organization declaration of a pandemic).

In practice, our reference period is 2015 through 2019. We least-squares fit a straight line to the same week or month in each of the five reference years as the week or month of interest, where the slope of this fitted line is constrained to always (for every week or month of interest) be equal to the slope of a least-squares fitted line to all of the all-cause mortality data (all weeks or months) in the full 5-year reference period, for each given country.

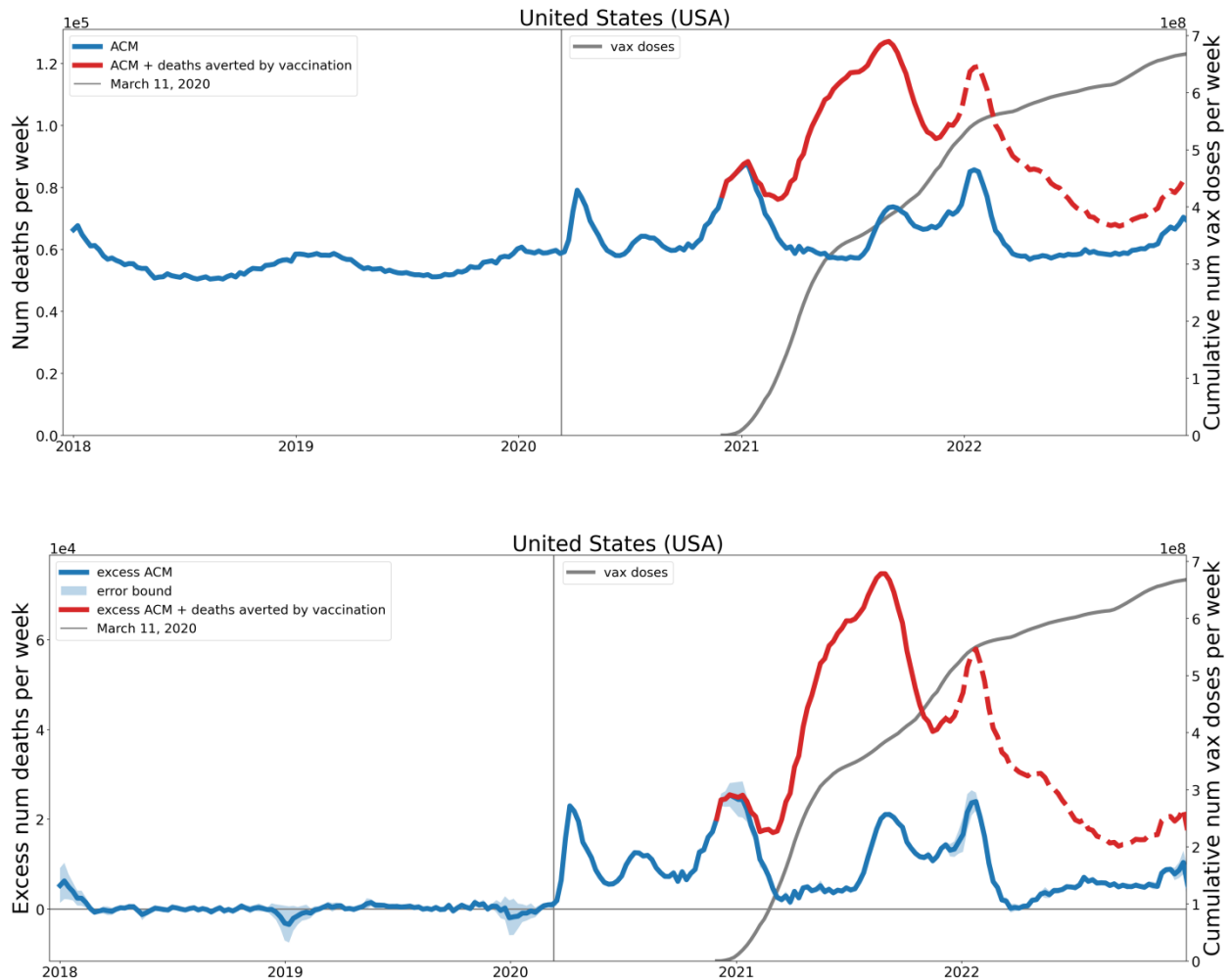
The thus obtained fitted line is used (by extrapolation) to predict the expected all-cause mortality. The one-standard-deviation ( $1\sigma$ ) uncertainty in the expected all-cause mortality is estimated as  $\sqrt{\pi/2}$  times the average magnitude of the 5 deviations in the 2015-2019 reference period, for each particular week or month of interest. This simple relation is exact in the limit of a large sampling number, for a normally distributed uncertainty.

Finally, the one-standard-deviation uncertainty of the excess mortality is the combined error that includes the  $1\sigma$  uncertainty in the expected value and the independent statistical ( $1\sigma$ ) error in the all-cause mortality ( $\sqrt{N}$ ).

## 4 Results and Discussion

Our results for all 95 countries, both in terms of all-cause mortality itself and excess all-cause mortality, are given in Appendix A.

Our calculations for the USA are shown in two panels in Figure 1, as follows.



**Figure 1. United States (USA): (top panel) All-cause mortality by week, 2018-2022, measured (blue), calculated following Watson et al. (2022) (red-solid), continued (red-dashed); (bottom panel) same, expressed as excess all-cause mortalities, and with  $1\sigma$  uncertainty (shaded blue). In both panels, cumulative COVID-19 vaccine administration (all-doses) (dark grey), 11 March 2020 date (vertical grey line).**

In all the mortality figures (for all 95 countries and for both raw and excess all-cause mortalities), “continued” (red-dashed line) simply means that the convolution calculation

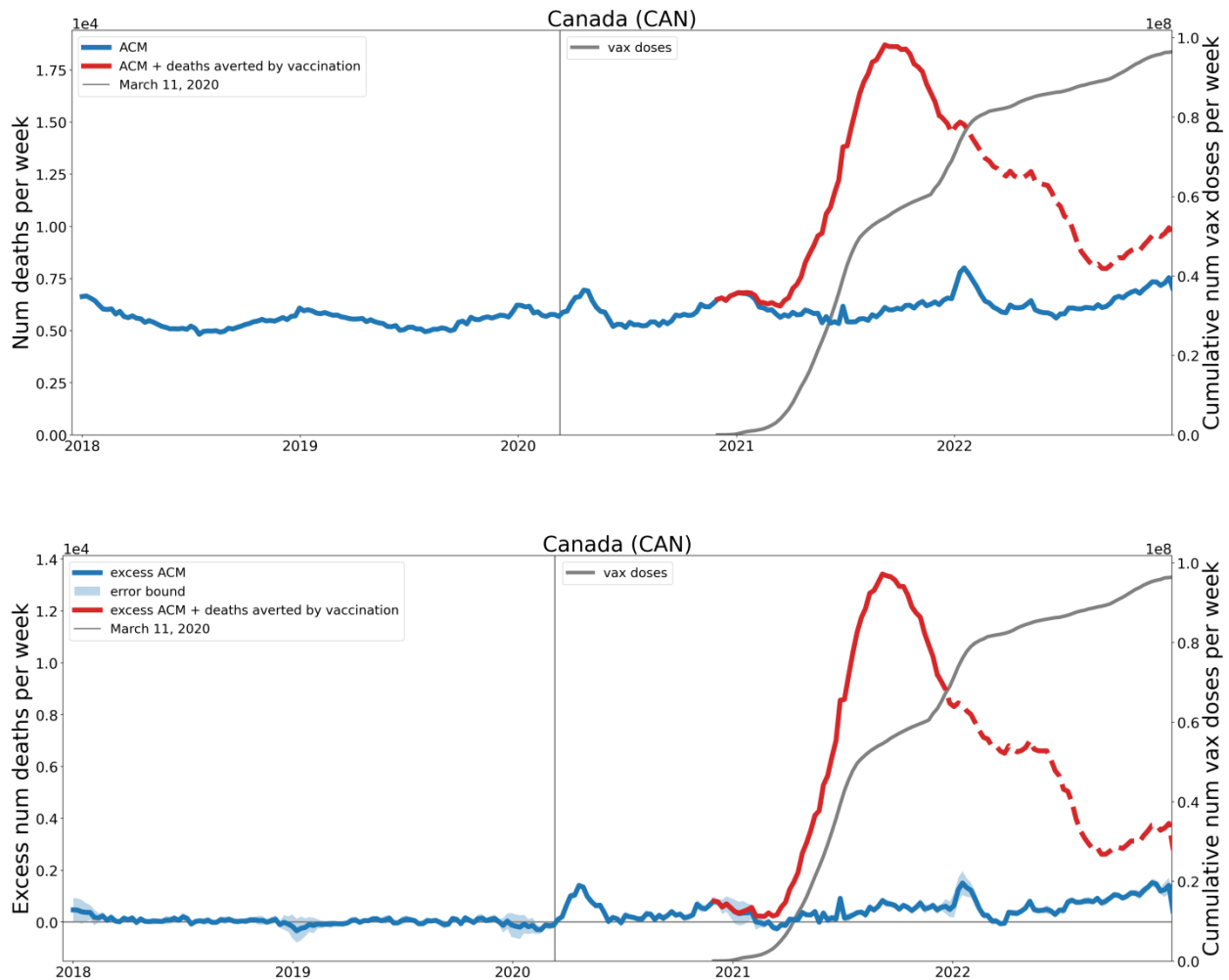
is continued beyond the period (8 December 2020 to 8 December 2021) corresponding to the Watson et al. (2022) simulation, using the same convolution parameters. In each of the mortality figures, the area between the red-solid and blue curves, in the period from 8 December 2020 to 8 December 2021, is equal to the low-value scenario number of lives saved reported by Watson et al. (2023) for the specific country.

In the USA, there are unprecedented peaks in all-cause mortality (and excess all-cause mortality) in 2020, 2021, and 2022 (Figure 1). These features and their epidemiological characteristics have been discussed extensively elsewhere (Rancourt et al., 2021, 2022a). March 11, 2020 is the date at which the World Health Organization (WHO) declared a pandemic.

If we believe that the low-value scenario of Watson et al. (2022) is a correct representation of reality for the USA, then Figure 1 shows that we have to believe that a massive and more-than-unprecedented national excess all-cause mortality — doubling the all-cause mortality by week for at least one year — would have occurred precisely in the period when the COVID-19 vaccines were mostly rolled out, and not before, had the vaccines not been rolled out.

This would be a remarkable coincidence, following several presumed waves of infection, and past one year of declared pandemic, in actual measured circumstances in which there is no visible decrease in all-cause mortality that is temporally associated with the rollouts. In fact, there are additional peaks and sustained excess all-cause mortality (Figure 1).

Let us move to Canada, which shares a large land border and intense trade relations with the USA. Our calculations for Canada are shown in two panels in Figure 2.



**Figure 2. Canada (CAN): (top panel) All-cause mortality by week, 2018-2022, measured (blue), calculated following Watson et al. (2022) (red-solid), continued (red-dashed); (bottom panel) same, expressed as excess all-cause mortalities, and with  $1\sigma$  uncertainty (shaded blue). In both panels, cumulative COVID-19 vaccine administration (all-doses) (dark grey), 11 March 2020 date (vertical grey line).**

From this calculation for Canada (Figure 2), we see that the Watson et al. (2022) low-value scenario is palpably absurd.

On the scale of these plots (Figure 2), essentially nothing happened following the WHO declaration of a pandemic, yet the low-value scenario of Watson et al. (2022) would have us believe that a disproportionate and massive national excess all-cause mortality — tripling the all-cause mortality by week for approximately one year — would have

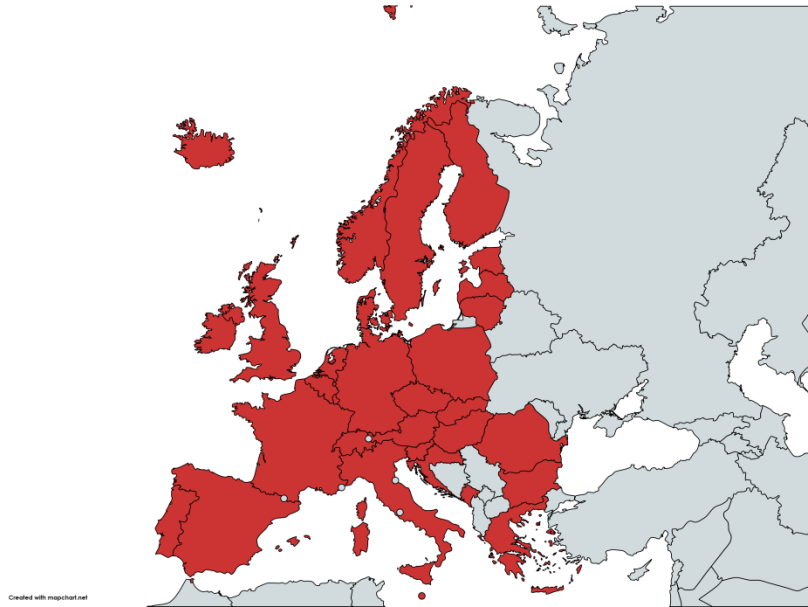
occurred precisely in the period when the COVID-19 vaccines were mostly rolled out, and not before, had the vaccines not been rolled out.

This, again, would be a remarkable coincidence, following presumed waves of infection, and past one year of declared pandemic, in measured circumstances in which not only is there no visible decrease in actual all-cause mortality that is temporally associated with the rollouts, but the opposite is apparent, with excess mortality proportionately accompanying rollouts (Figure 2, bottom panel).

Similarly absurd results, citing Watson et al. (2022), and not solely for vaccination, have been proposed previously for Canada (Ogden et al., 2022), and have been critiqued (Rancourt et al., 2022b).

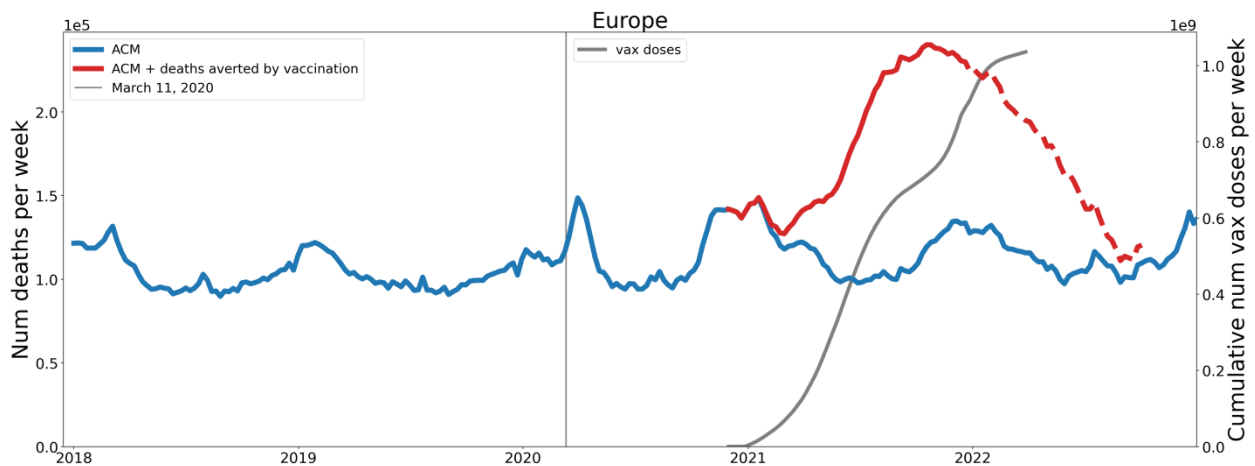
Crossing the Atlantic to Europe, results for a consolidated group of 31 European countries, chosen because their data is by week, are as follows.

Figure 3 shows a map of the 31 countries: Austria, Belgium, Bulgaria, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and United Kingdom.

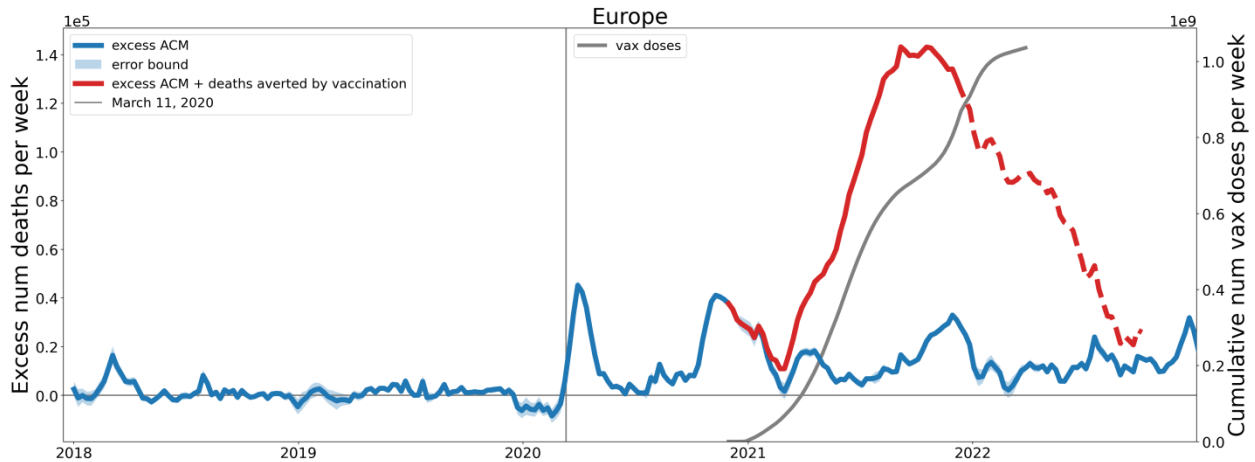


**Figure 3. Map showing the 31 European countries (in red) treated together as a single jurisdiction, for the purpose of calculating mortality behaviour by time.**

Our calculations for this group of 31 European countries, together treated as a single jurisdiction, are shown in two panels in Figure 4. Here, we ended the cumulative vaccination data at the first date for which there was no data for any one of the 31 countries (29 March 2022, Iceland).



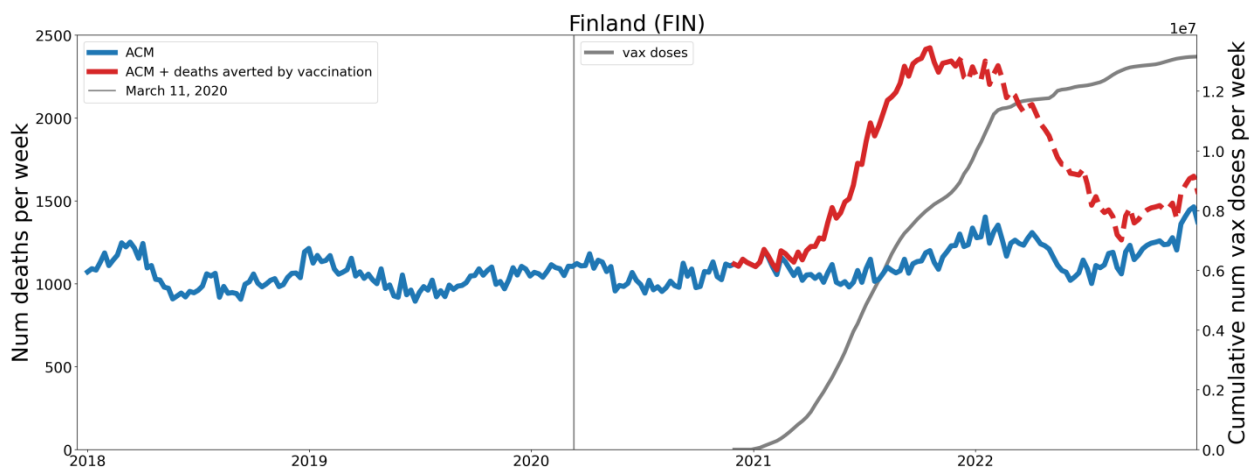


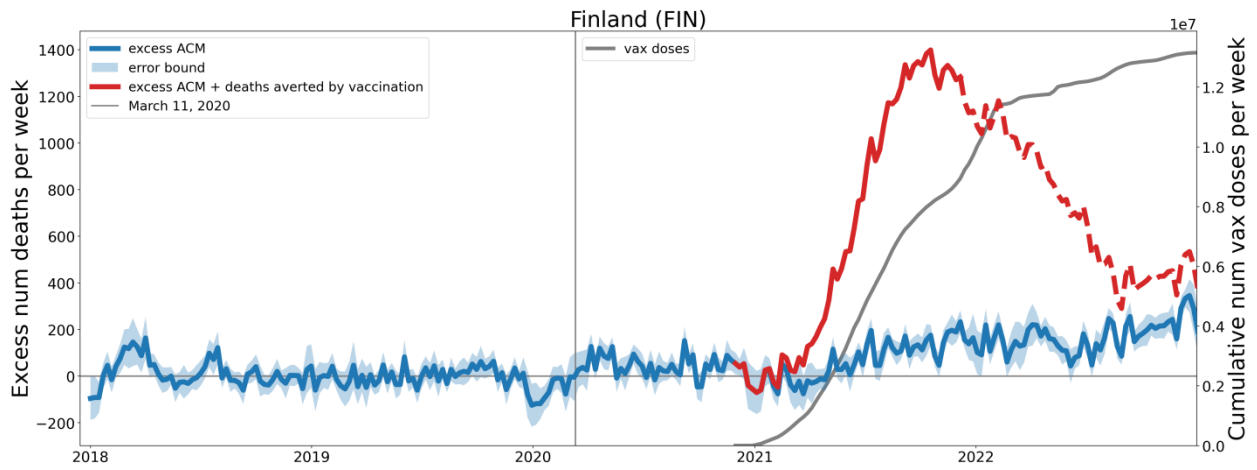


**Figure 4. Thirty-one European countries: (top panel) All-cause mortality by week, 2018-2022, measured (blue), calculated following Watson et al. (2022) (red-solid), continued (red-dashed); (bottom panel) same, expressed as excess all-cause mortalities, and with  $1\sigma$  uncertainty (shaded blue). In both panels, cumulative COVID-19 vaccine administration (all-doses) (dark grey), 11 March 2020 date (vertical grey line).**

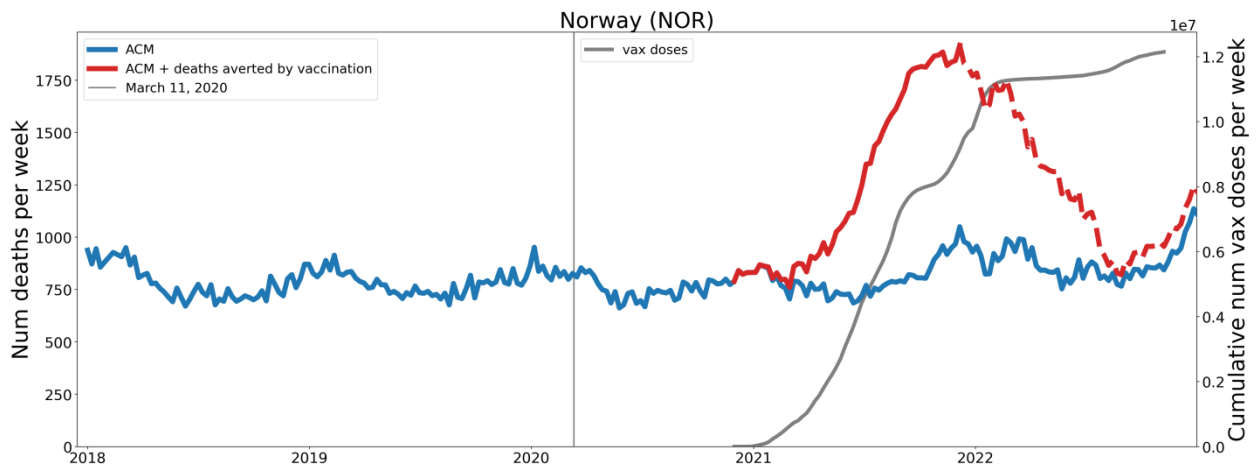
The situation for Europe (Figure 4) is perfectly analogous to that for the USA (Figure 1), and we make the same interpretation. The mortality implications that follow from Watson et al. (2022), regarding lives saved by COVID-19 vaccination, are inconceivable in the light of what actually occurred.

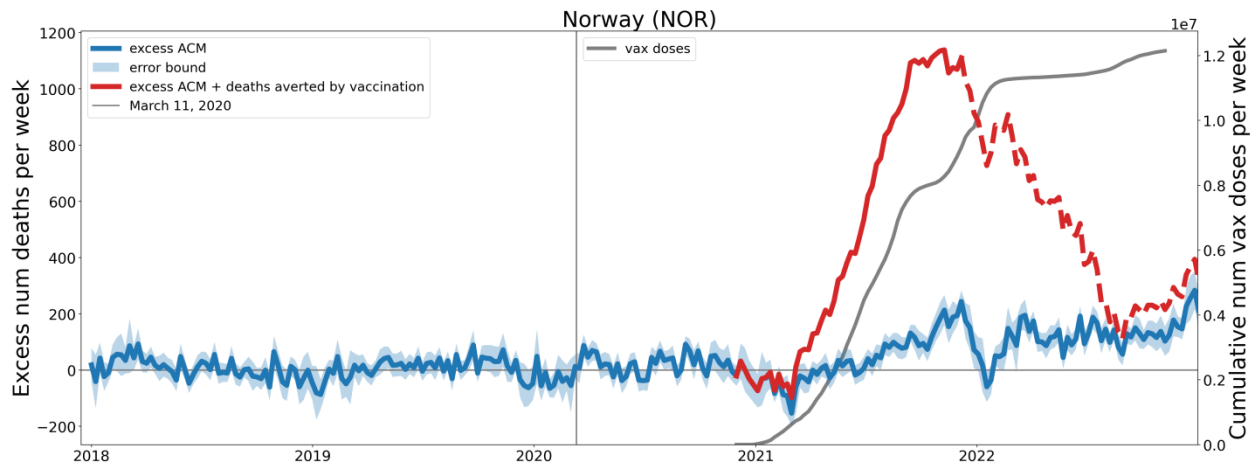
The incongruence with actual mortality is even more striking when we examine specific European countries. Figure 5 and Figure 6 show the similar cases of Finland and Norway, respectively.





**Figure 5. Finland (FIN): (top panel) All-cause mortality by week, 2018-2022, measured (blue), calculated following Watson et al. (2022) (red-solid), continued (red-dashed); (bottom panel) same, expressed as excess all-cause mortalities, and with  $1\sigma$  uncertainty (shaded blue). In both panels, cumulative COVID-19 vaccine administration (all-doses) (dark grey), 11 March 2020 date (vertical grey line).**





**Figure 6. Norway (NOR): (top panel) All-cause mortality by week, 2018-2022, measured (blue), calculated following Watson et al. (2022) (red-solid), continued (red-dashed); (bottom panel) same, expressed as excess all-cause mortalities, and with  $1\sigma$  uncertainty (shaded blue). In both panels, cumulative COVID-19 vaccine administration (all-doses) (dark grey), 11 March 2020 date (vertical grey line).**

Finland (Figure 5) and Norway (Figure 6) have remarkably similar mortality behaviours to each other. Both demonstrate, again, that the Watson et al. (2022) low value scenario is absurd, compared to directly observed all-cause mortality.

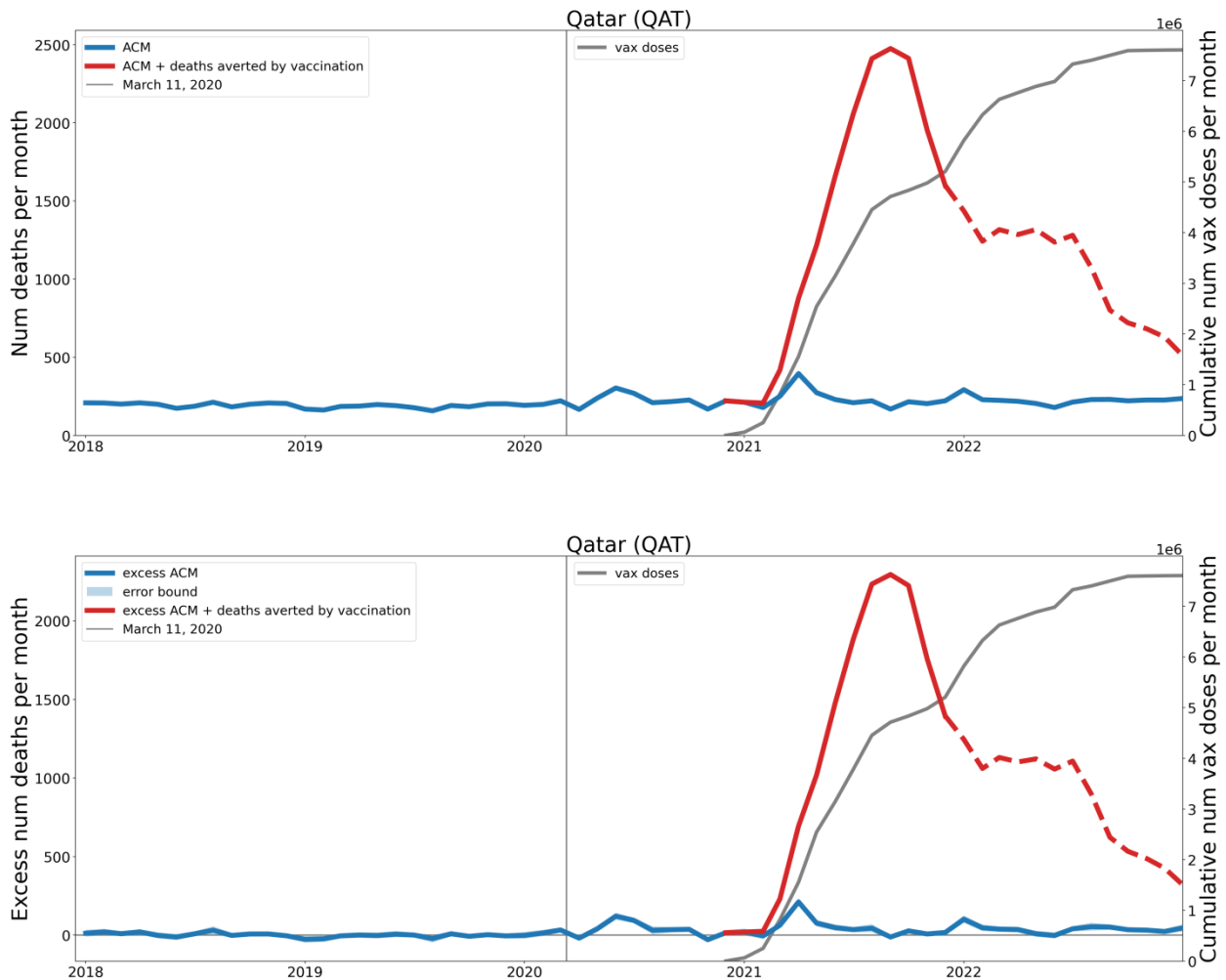
On the scale of these plots (Figure 5, Figure 6), nothing detectably happened following the WHO declaration of a pandemic, yet the low-value scenario of Watson et al. (2022) would have us believe that a disproportionate and massive national excess all-cause mortality — doubling the all-cause mortality by week for approximately one year — would have occurred precisely in the period when the COVID-19 vaccines were mostly rolled out, and not before, had the vaccines not been rolled out.

This remarkable coincidence (which is present for virtually every country, above and Appendix A) would occur:

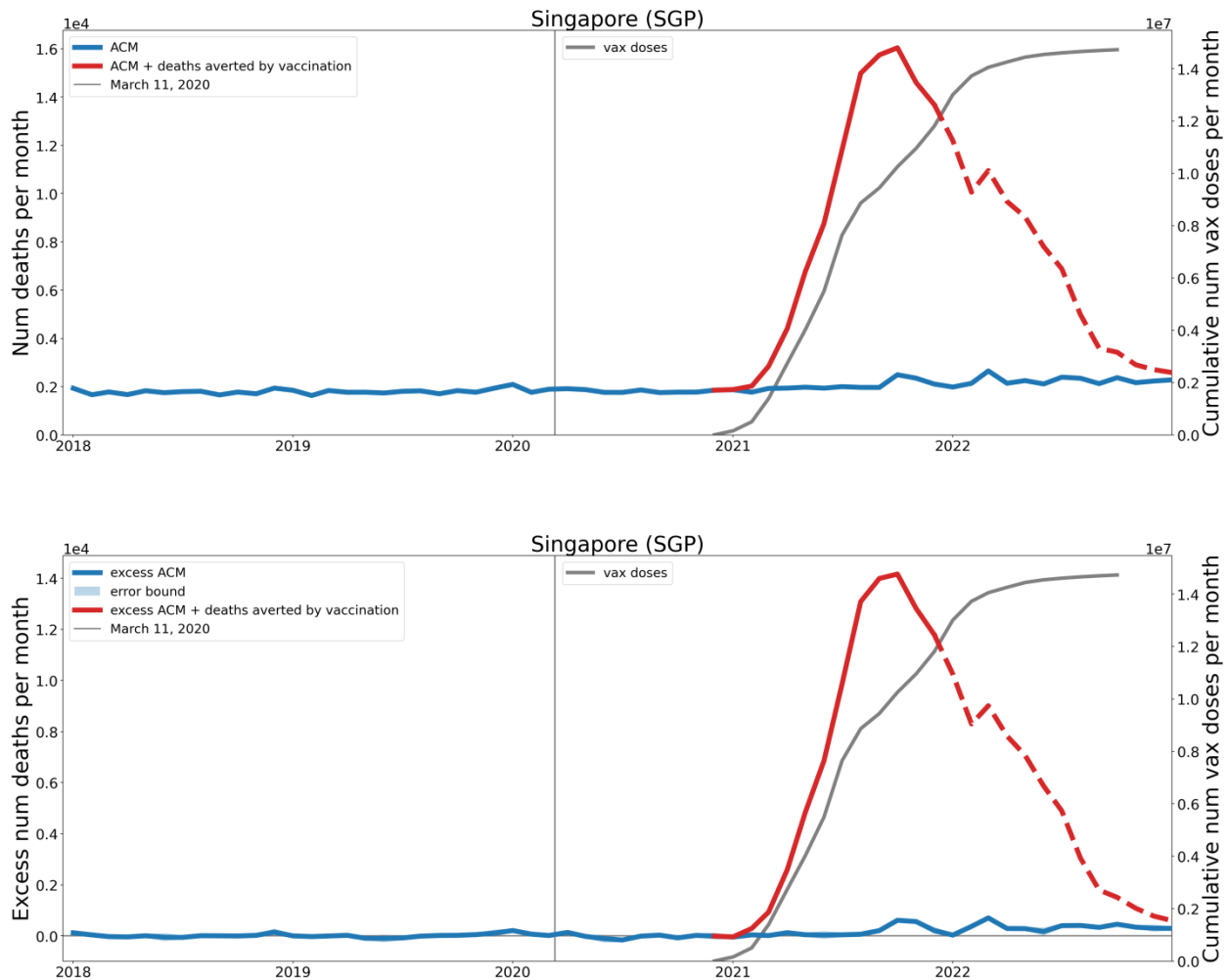
- i. following presumed waves of infection (which, here, in Finland and Norway, did not cause any detectable excess all-cause mortality),
- ii. past one year of declared pandemic, and
- iii. in actual measured circumstances in which not only is there no visible decrease in all-cause mortality that is temporally associated with the rollouts but the

opposite is true, with gradual rises in excess all-cause mortality during the rollouts (Figure 5, Figure 6, bottom panels).

Finally, let us examine two particularly striking examples, on different continents, each one sufficient to disprove the validity of Watson et al. (2022)'s low-value scenario (and their high-value scenario of 19.8 million saved lives). Figure 7 shows the case of Qatar, and Figure 8 shows the case of Singapore.



**Figure 7. Qatar (QAT): (top panel) All-cause mortality by week, 2018-2022, measured (blue), calculated following Watson et al. (2022) (red-solid), continued (red-dashed); (bottom panel) same, expressed as excess all-cause mortalities, and with  $1\sigma$  uncertainty (shaded blue). In both panels, cumulative COVID-19 vaccine administration (all-doses) (dark grey), 11 March 2020 date (vertical grey line).**



**Figure 8. Singapore (SGP): (top panel) All-cause mortality by week, 2018-2022, measured (blue), calculated following Watson et al. (2022) (red-solid), continued (red-dashed); (bottom panel) same, expressed as excess all-cause mortalities, and with  $1\sigma$  uncertainty (shaded blue). In both panels, cumulative COVID-19 vaccine administration (all-doses) (dark grey), 11 March 2020 date (vertical grey line).**

For both Qatar (Figure 7) and Singapore (Figure 8), the results are staggering.

Here (Figure 7, Figure 8), the low-value scenario (14.4 million saved lives) of Watson et al. (2022) corresponds to an approximately 10-fold increase in all-cause mortality by month, lasting 3 months or more in 2021, whereas both countries, on this scale, have virtually no change in measured all-cause mortality, across the declared pandemic (2020-2023), compared to the historic values (< 2020).

In all such cases, including all the examples described above, one has to wonder how it is possible that massive excess all-cause mortality would have occurred, solely during vaccine rollouts, and that the COVID-19 vaccination would have reduced this mortality down to precisely the pre-declared-pandemic values or pre-COVID-19-vaccination values, and not to some intermediate value of mortality, across at least one year of vaccination. This extraordinary coincidence essentially occurs in most of 95 countries (Appendix A).

In fact, the said coincidence is palpably so improbable that it should, without hesitation, be qualified as impossible. A single such example in a single country is sufficient to invalidate the exercise of Watson et al. (2022), and the example is repeated for 95 countries (Appendix A).

## **5 Conclusion**

We calculated the quantitative consequences of Watson et al. (2022)'s theoretical scenario on all-cause mortality by time (by week or by month, 2020-2022) in 95 countries.

Our calculations provide graphical proof that the theoretical proposals of Watson et al. (2022) — corresponding globally to 14.4 or 19.8 million lives saved by COVID-19 vaccination — are untenable, and are not even partially correct.

There is no evidence in actual all-cause mortality data that the COVID-19 vaccine rollouts had any beneficial effect. In fact, the contrary is apparent.

Importantly, this means that the characteristics of the COVID-19 vaccines (efficacies in preventing infection or serious illness, duration of protection, waning, etc.) and of COVID-19 spread input by Watson et al. (2022) must be invalid.

In other words, the COVID-19 vaccine efficacies and COVID-19 spread implemented in the Watson et al. (2022) scenarios predict massive mortality reductions on the global scale, which are incompatible with reality.

The following additional consequences and criticisms follow from our demonstration:

- Theoretical modellers that apply their trade to epidemiological problems are entirely able to misdirect themselves, without validating their results by comparisons to hard data.
- The legacy-journal peer review system has failed remarkably in the case of Watson et al. (2022), which suggests scientific illiteracy among reviewers and editors.
- Scientists, editors, lawmakers and Nobel Prize committee members are susceptible to accepting self-serving fantastic claims, without question.
- Leading legacy media have made and repeated absurd statements about Nobel-Prize COVID-19 vaccines having saved millions of lives, without any significant verification.

## 6 References

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Rancourt, D.G., Baudin, M. and Mercier, J. (2021) /// Nature of the COVID-era public health disaster in the USA, from all-cause mortality and socio-geo-economic and climatic data. /// *Research Gate* (25 October 2021)  
/// <http://dx.doi.org/10.13140/RG.2.2.11570.32962>

Rancourt, D.G., Baudin, M. and Mercier, J. (2022a) /// COVID-Period Mass Vaccination Campaign and Public Health Disaster in the USA: From age/state-resolved all-cause mortality by time, age-resolved vaccine delivery by time, and socio-geo-economic data /// *Research Gate* (2 August 2022) /// <http://dx.doi.org/10.13140/RG.2.2.12688.28164> /// Also available at: <https://vixra.org/abs/2208.0023>

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Watson OJ, Barnsley G, Toor J, Hogan AB, Winskill P, Ghani AC. (2022) "Global impact of the first year of COVID-19 vaccination: a mathematical modelling study". *Lancet Infect Dis*. 2022 Sep;22(9):1293-1302. doi: 10.1016/S1473-3099(22)00320-6. Epub 2022 Jun 23. Erratum in: *Lancet Infect Dis*. 2023 Oct;23(10):e400. PMID: 35753318; PMCID: PMC9225255. [https://doi.org/10.1016/s1473-3099\(22\)00320-6](https://doi.org/10.1016/s1473-3099(22)00320-6)



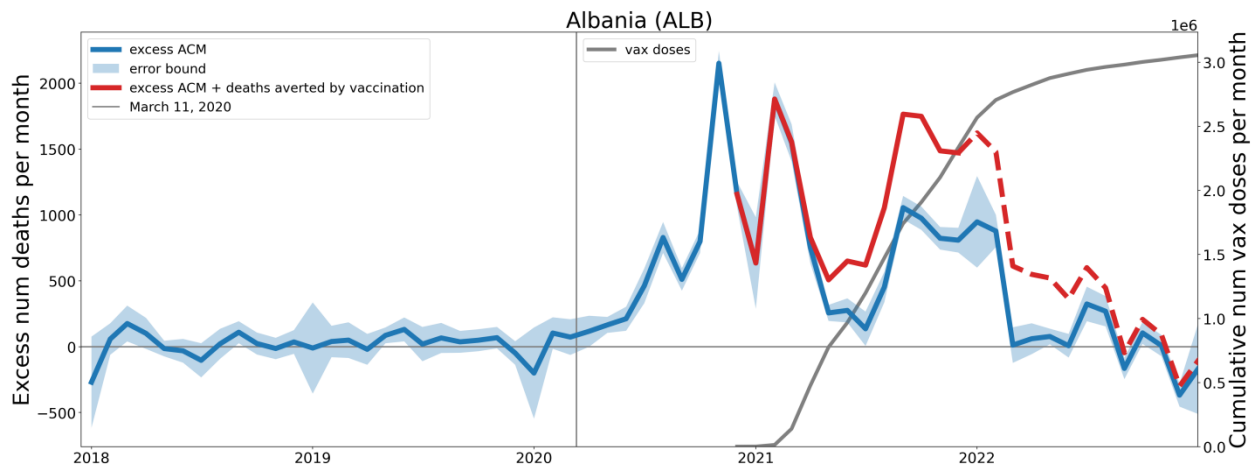
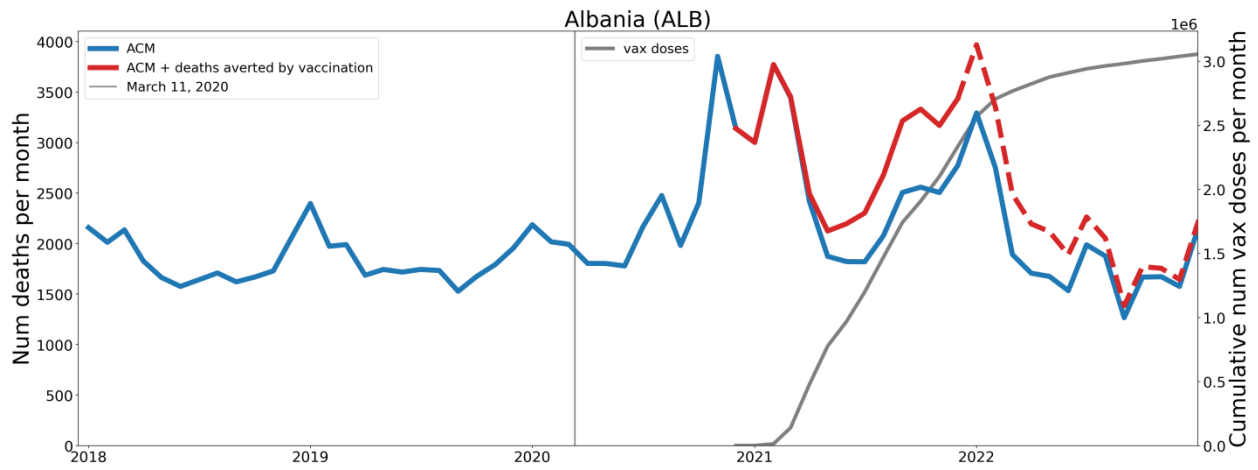
## 7 Appendix A

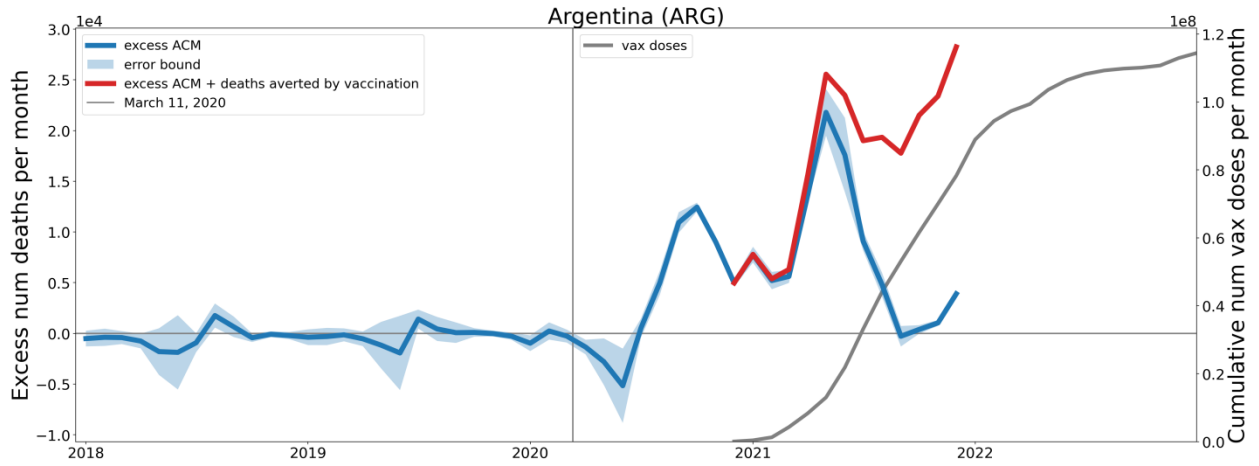
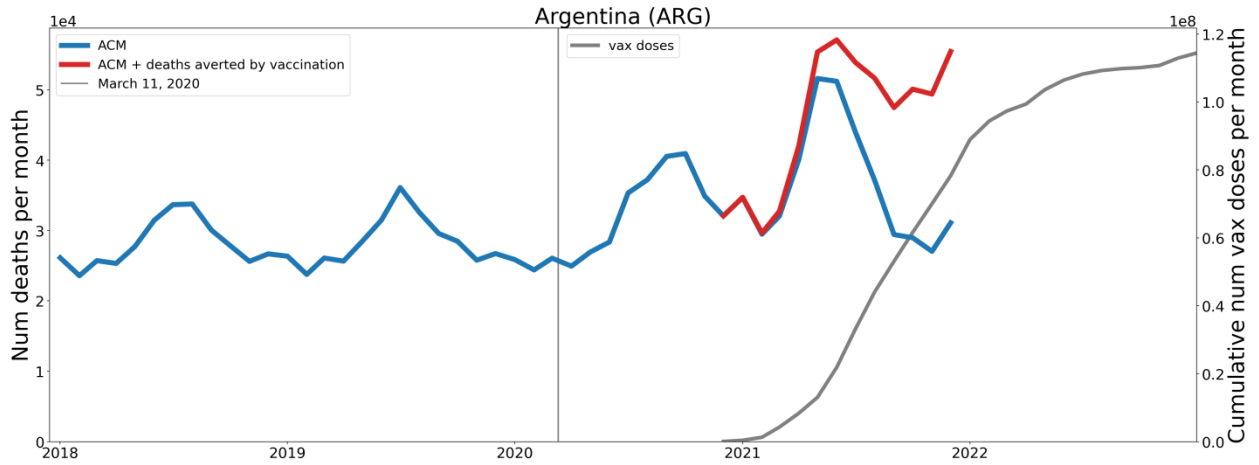
### **Figures showing the calculations of the quantitative consequences of Watson et al. (2022)'s low-value (14.4 million lives saved) theoretical scenario on all-cause mortality (and excess all-cause mortality) by time (by week or by month), 2018-2022, in 95 countries**

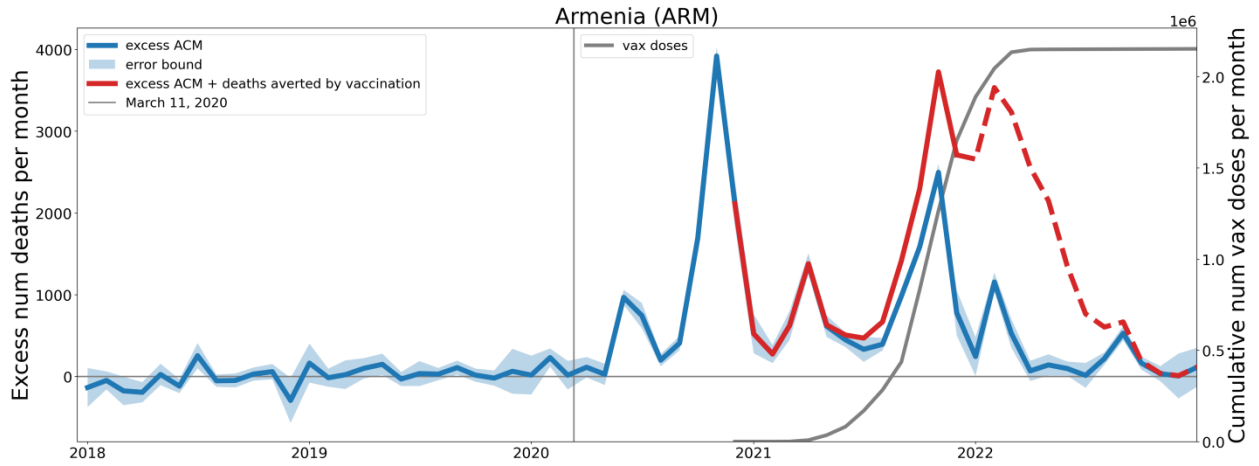
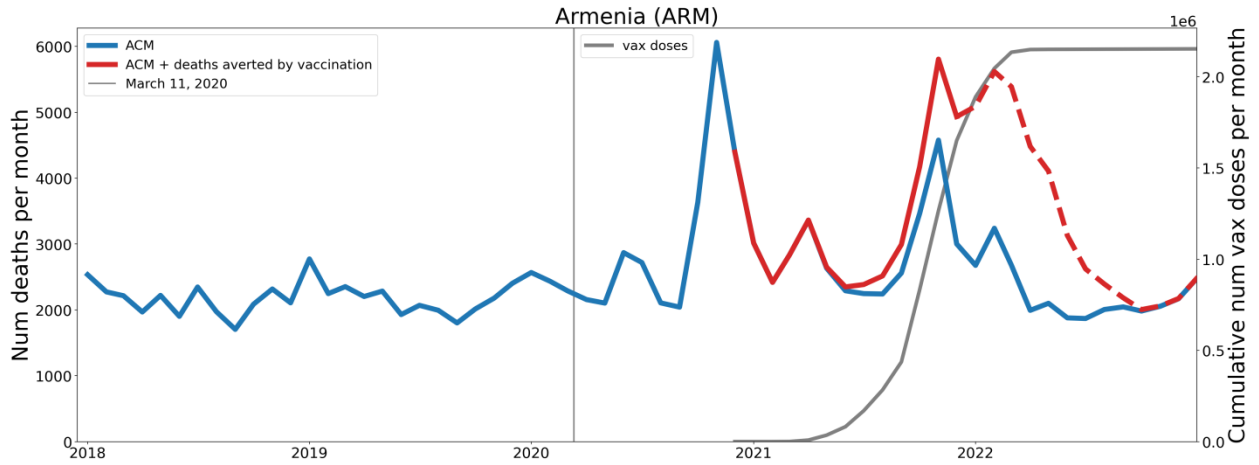
The 95 countries for which calculations are performed are: Albania, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Barbados, Belgium, Belize, Bhutan, Bolivia, Brazil, Brunei, Bulgaria, Canada, Chile, Colombia, Costa Rica, Croatia, Cuba, Cyprus, Czechia, Denmark, Dominican Republic, Ecuador, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Guatemala, Hungary, Iceland, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Latvia, Lebanon, Lithuania, Luxembourg, Malaysia, Maldives, Malta, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Netherlands, New Zealand, Nicaragua, North Macedonia, Norway, Oman, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia, Seychelles, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Suriname, Sweden, Switzerland, Taiwan, Tajikistan, Thailand, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, and Uzbekistan.

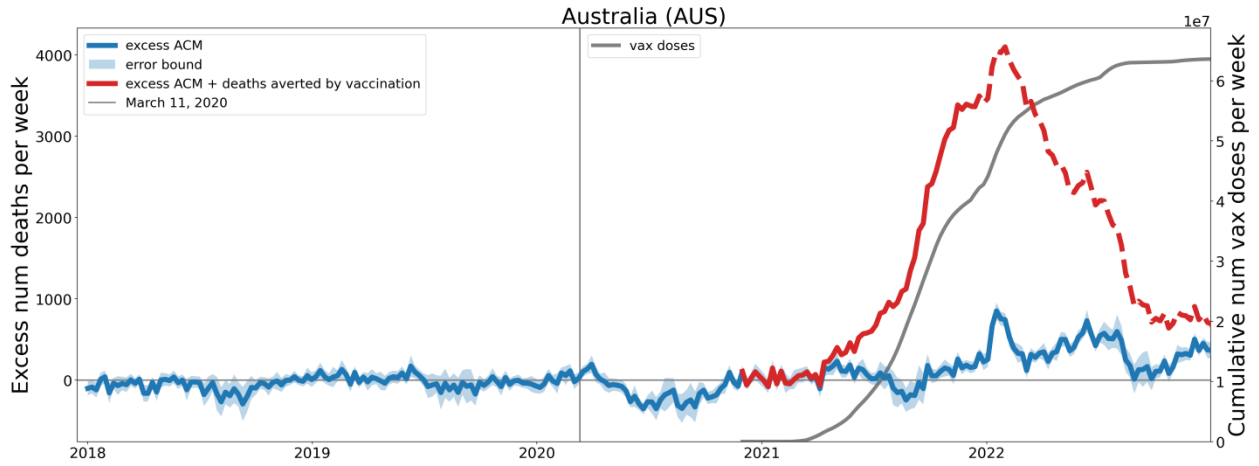
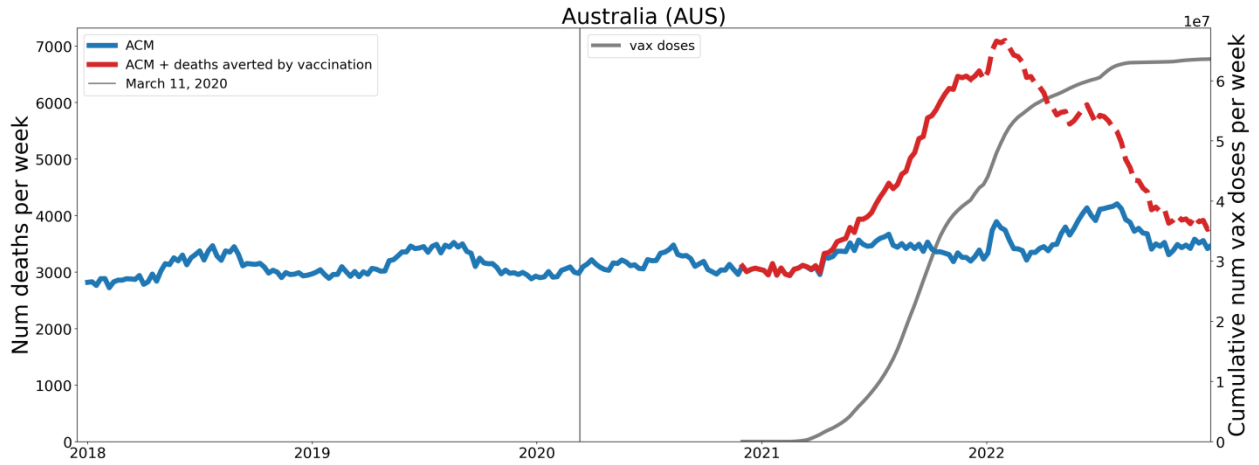
The figures are presented in alphabetical order by country (as labelled), using the same methods and definitions as explained in the main text of the article, with two panels for each country:

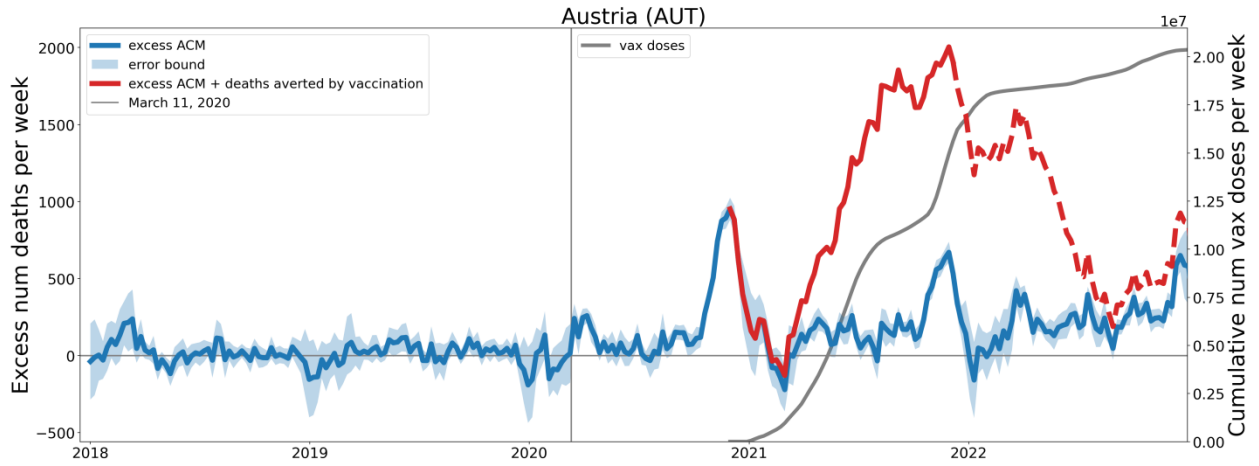
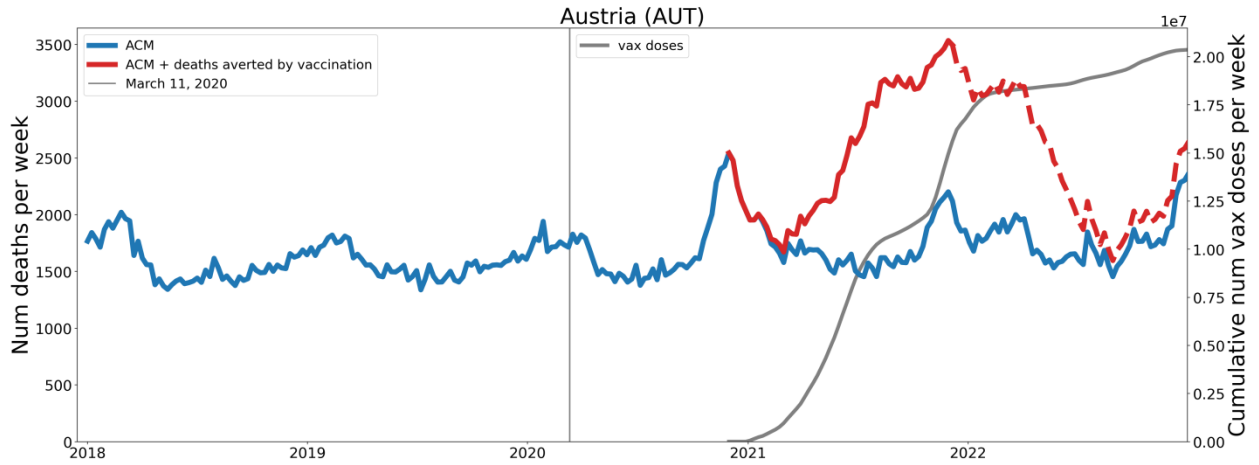
- (top panel) All-cause mortality by week, 2018-2022, measured (blue), calculated following Watson et al. (2022) (red solid), continued (red-dashed).
- (bottom panel) Same, expressed as excess all-cause mortalities, and with  $1\sigma$  uncertainty (shaded blue).
- In both panels, cumulative COVID-19 vaccine administration (all-doses) (dark grey), 11 March 2020 date of the WHO declaration of a pandemic (vertical grey line).

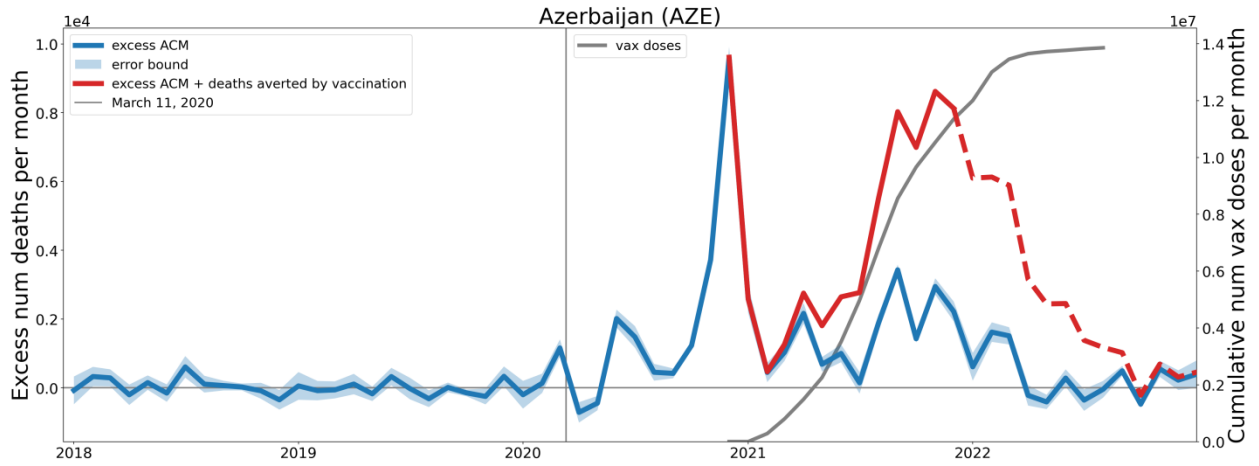
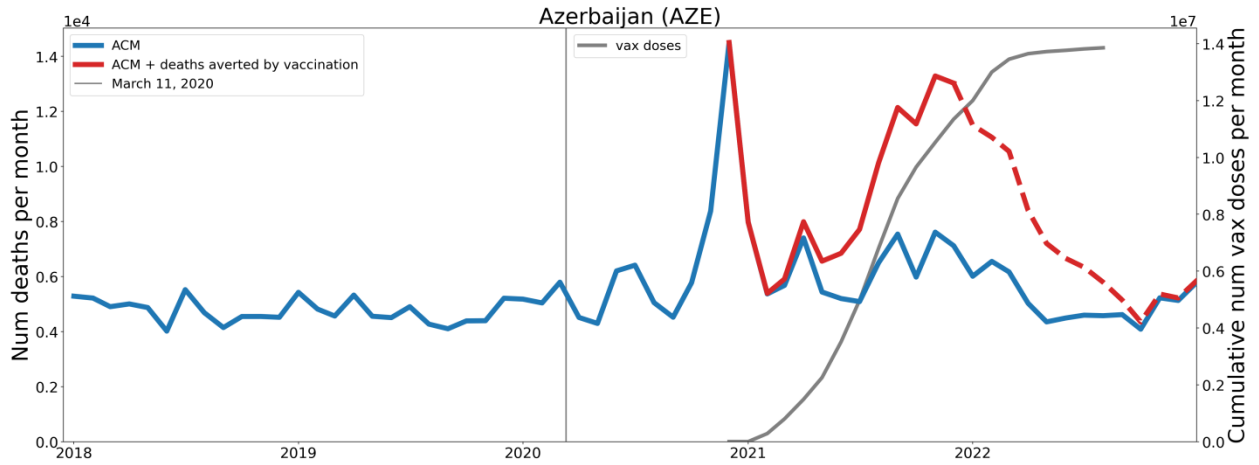


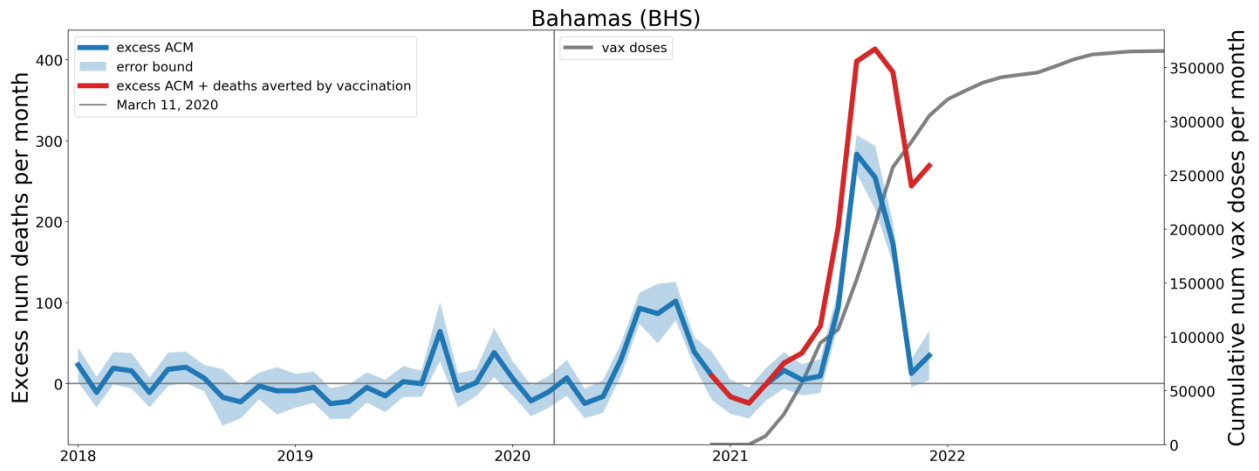
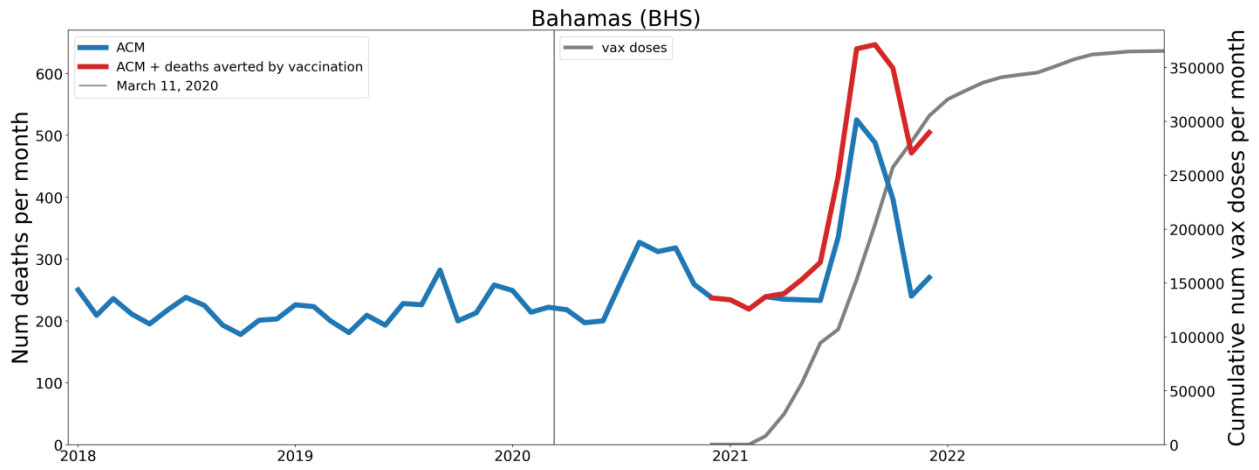




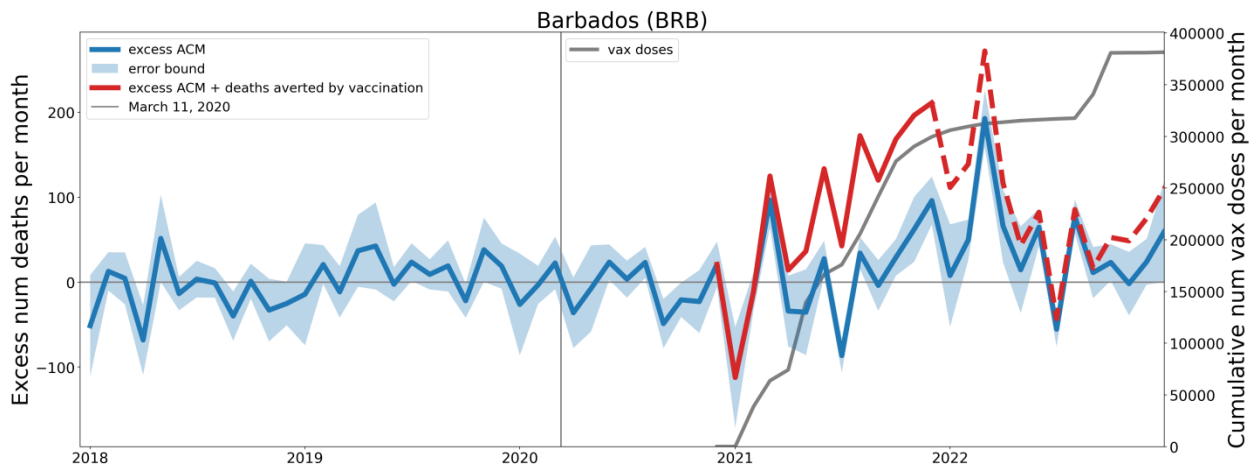
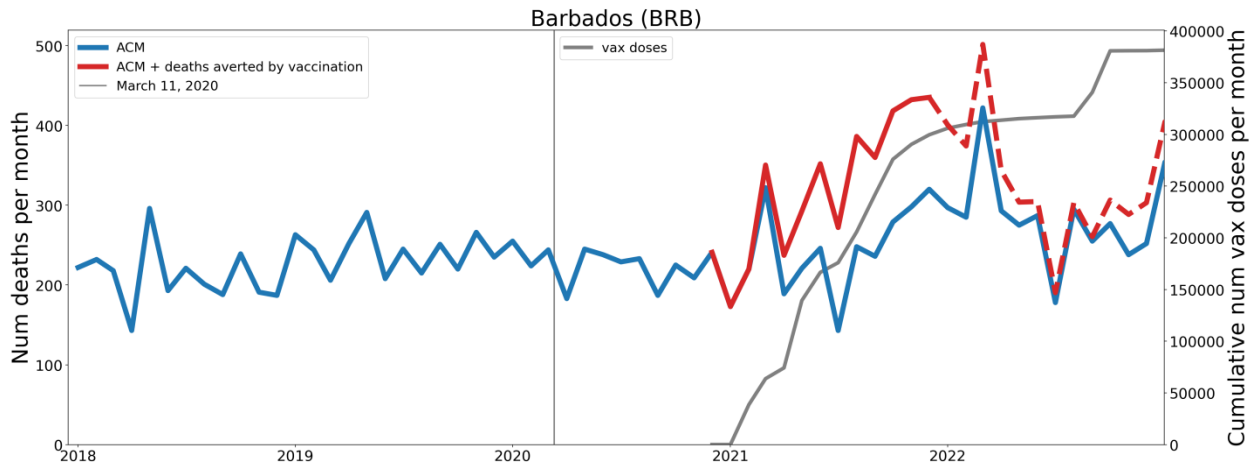


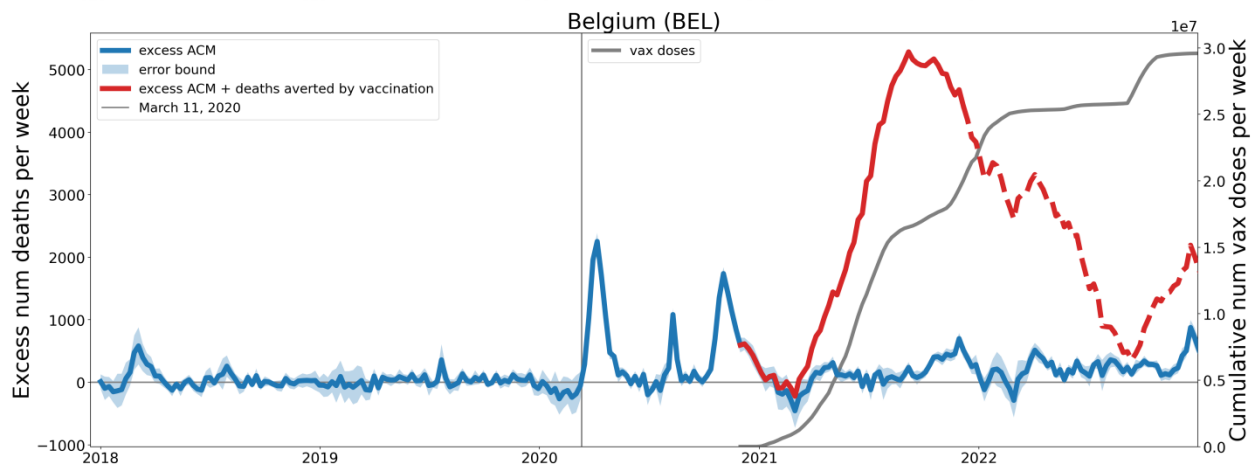
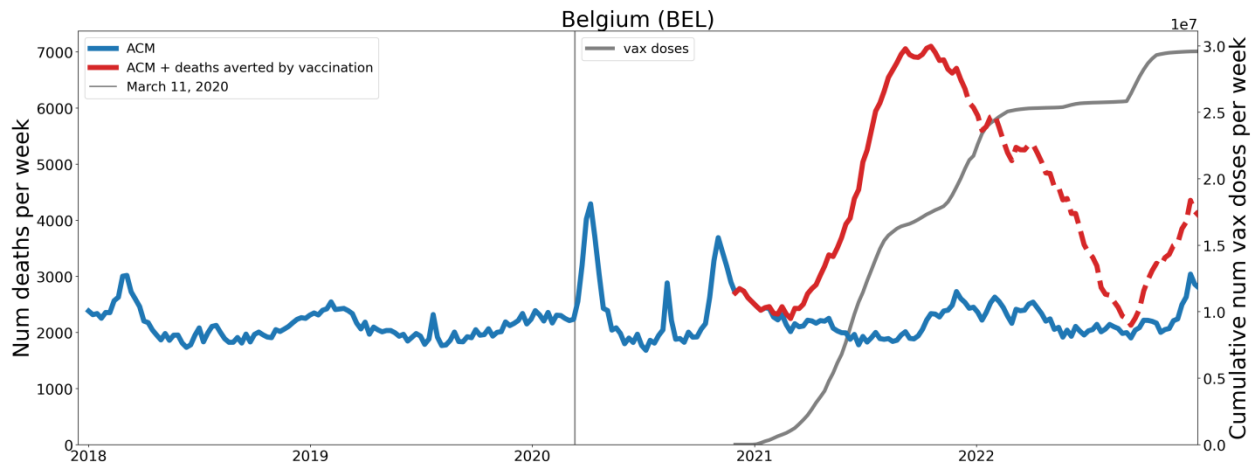


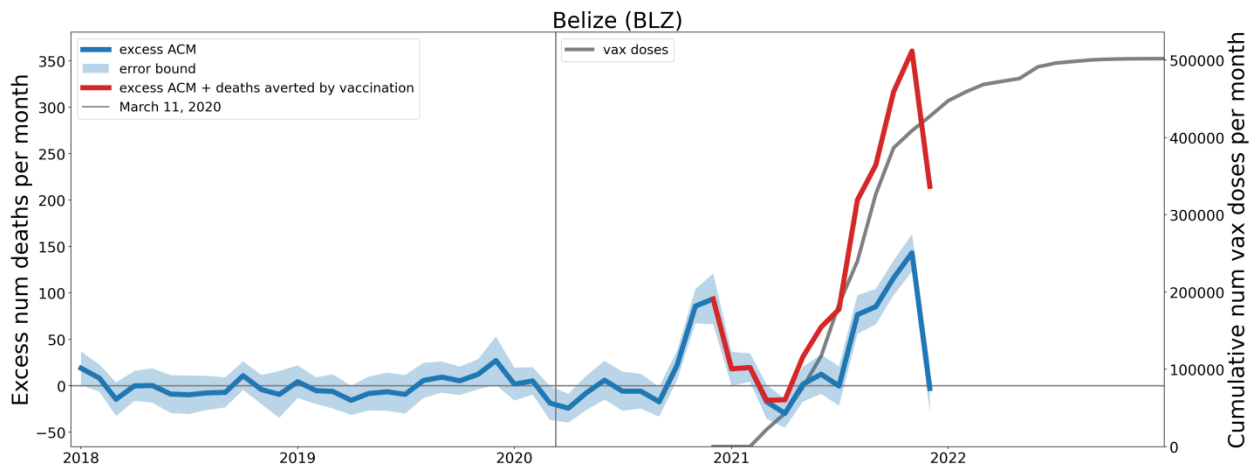
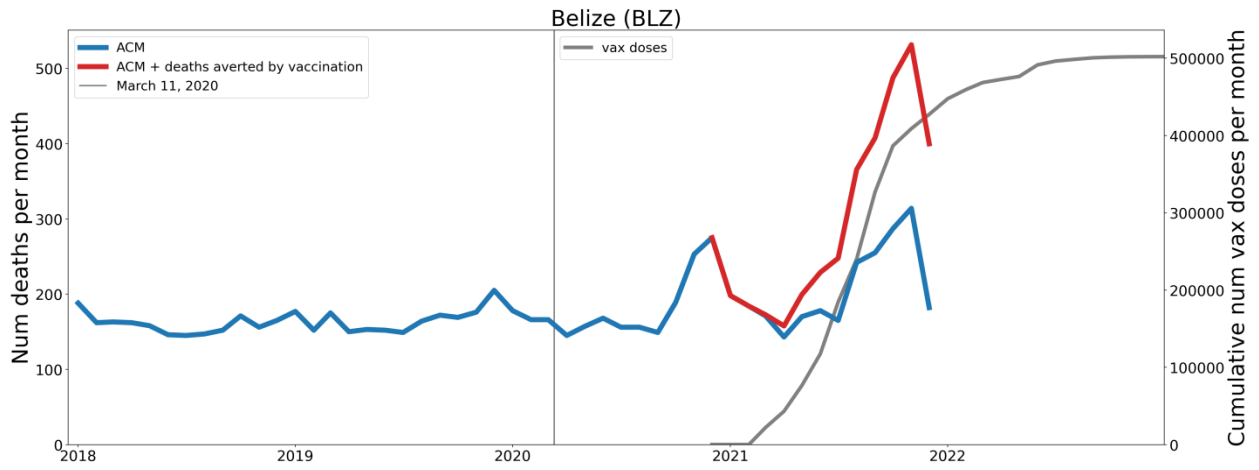


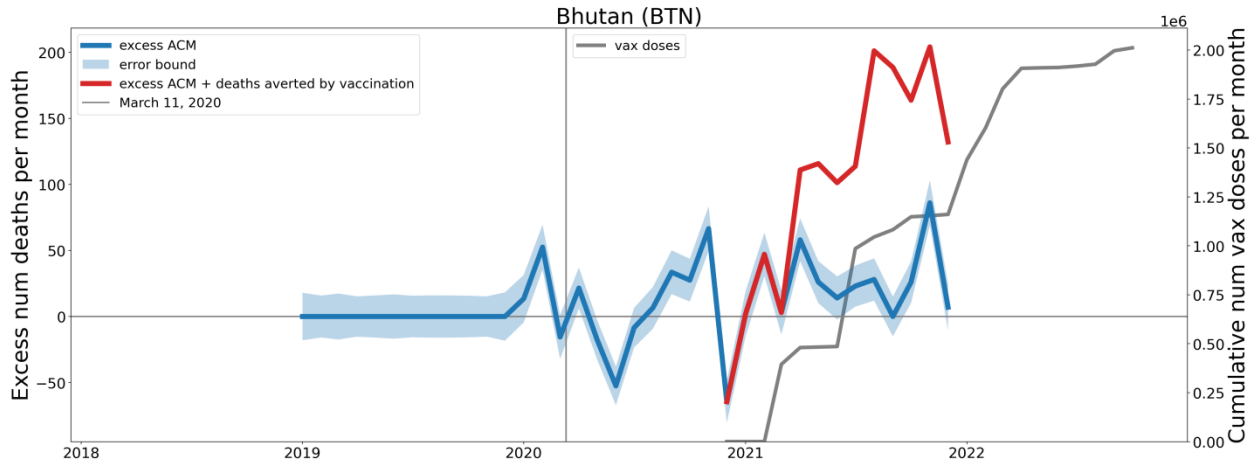
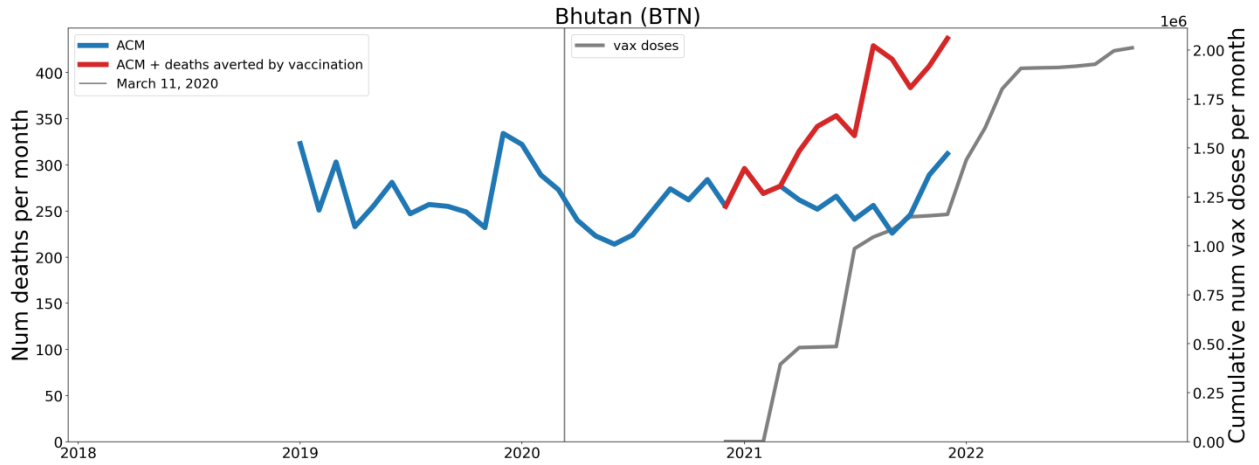


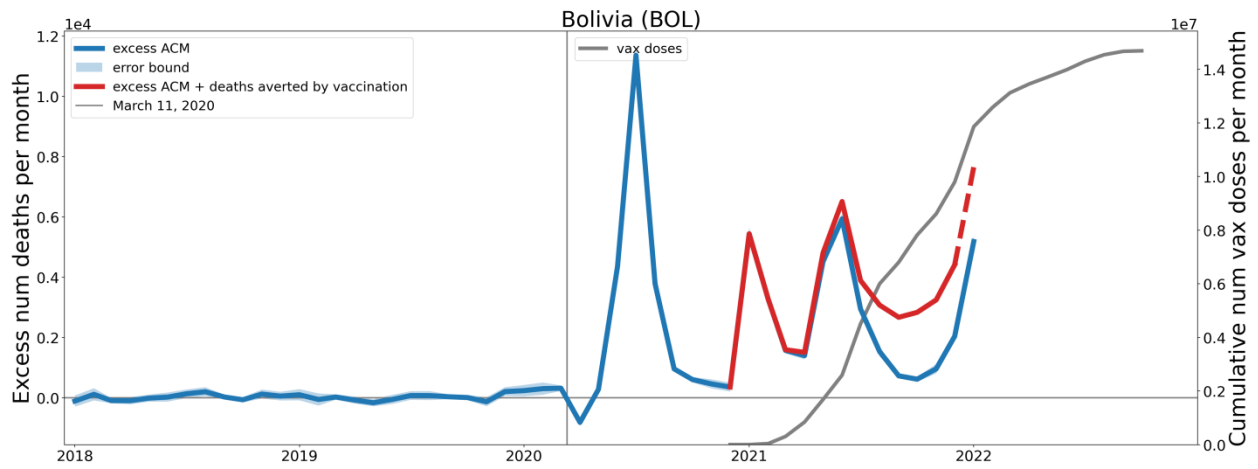
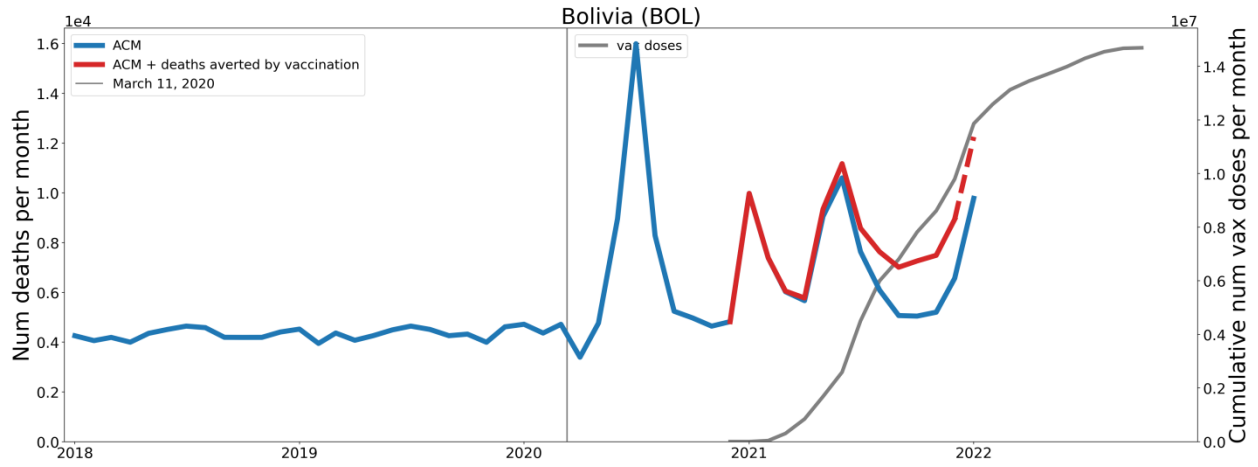


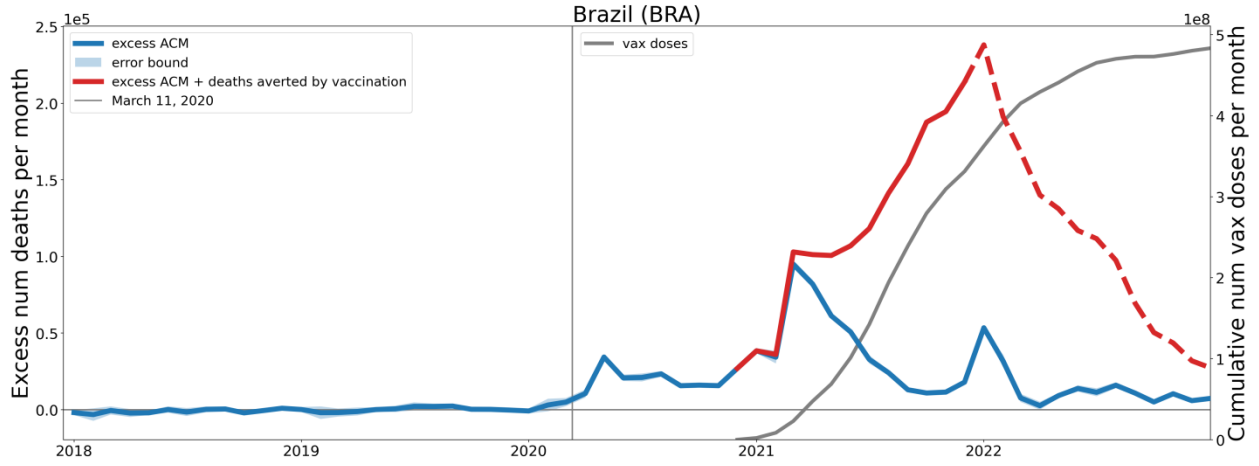
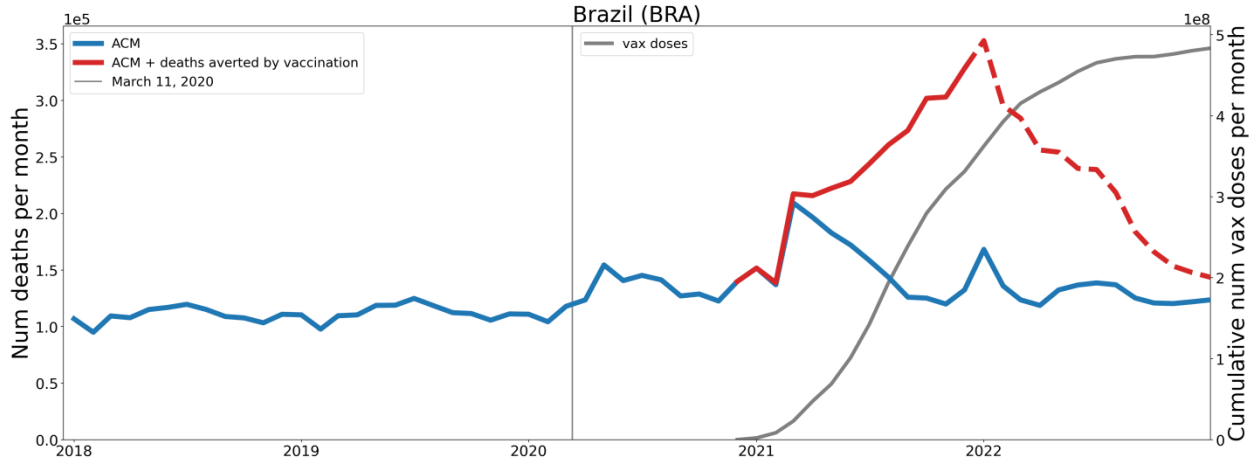


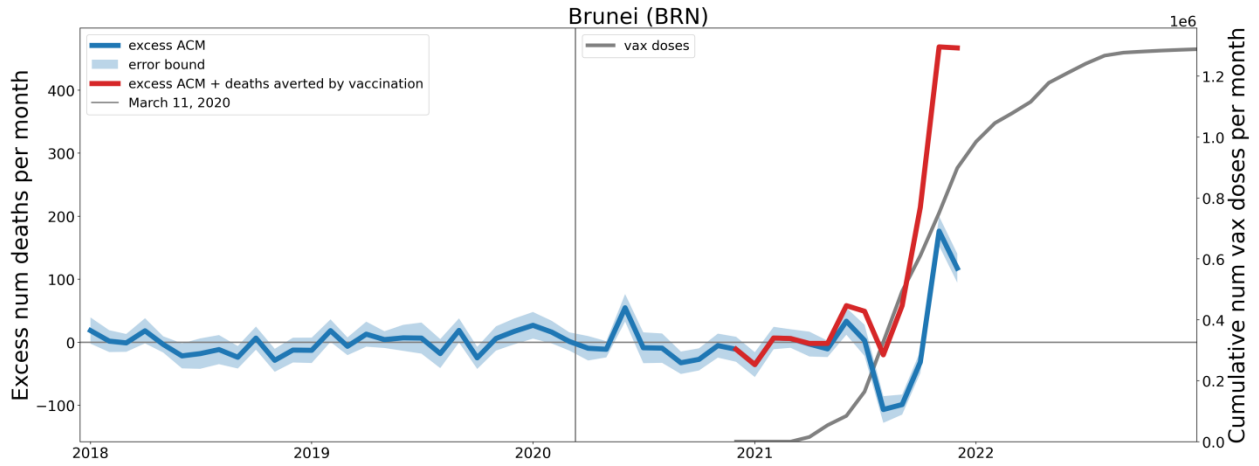
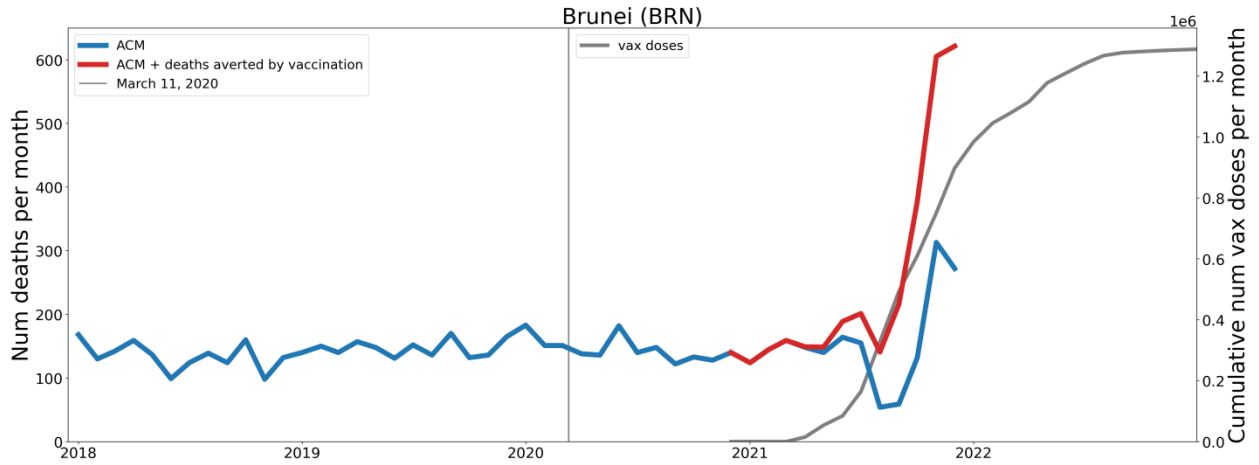


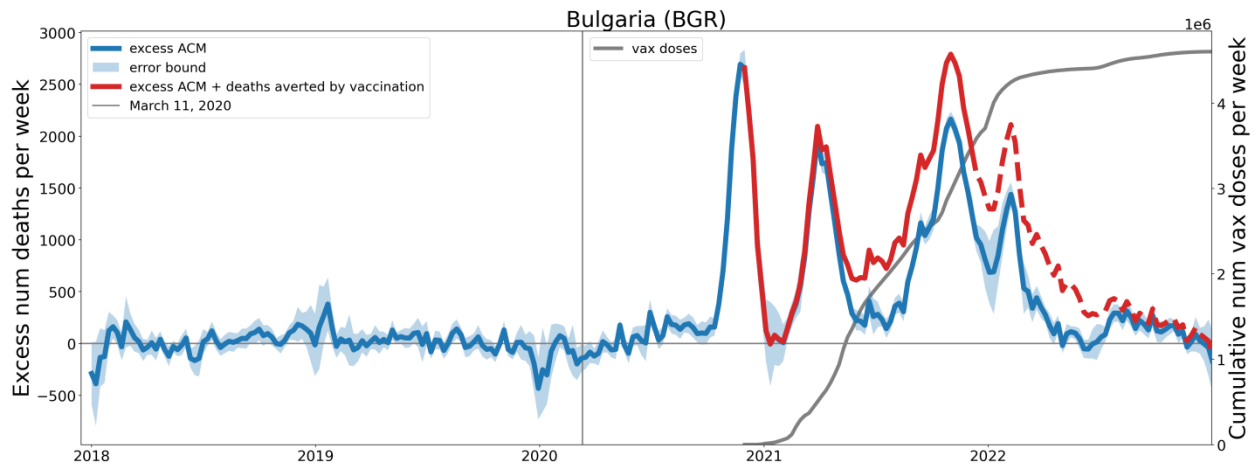
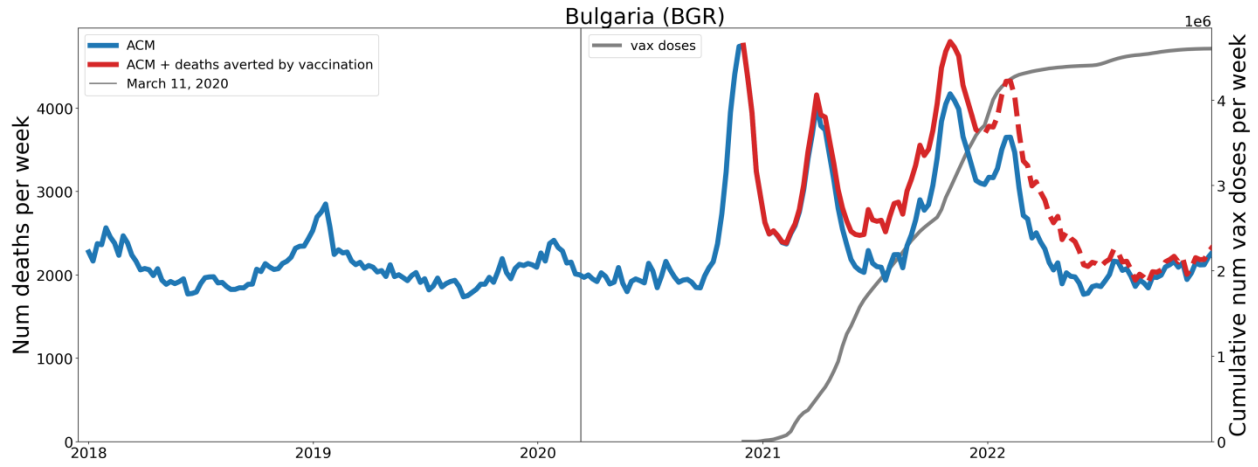




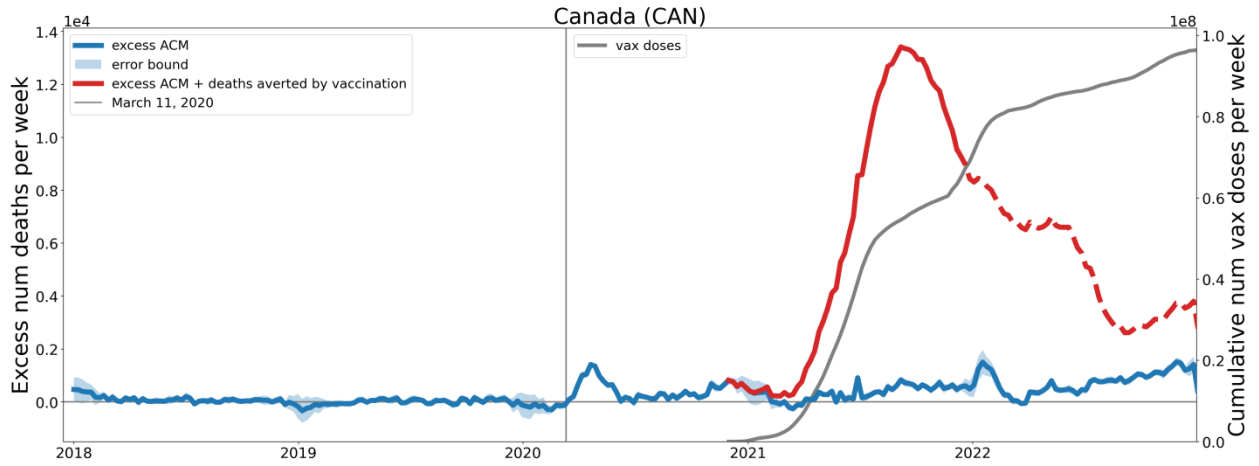
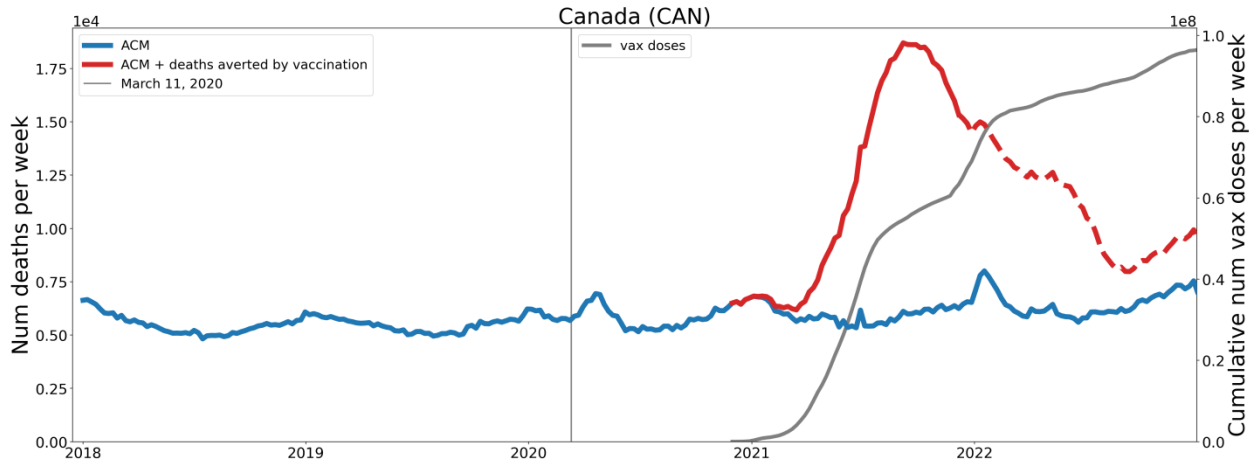


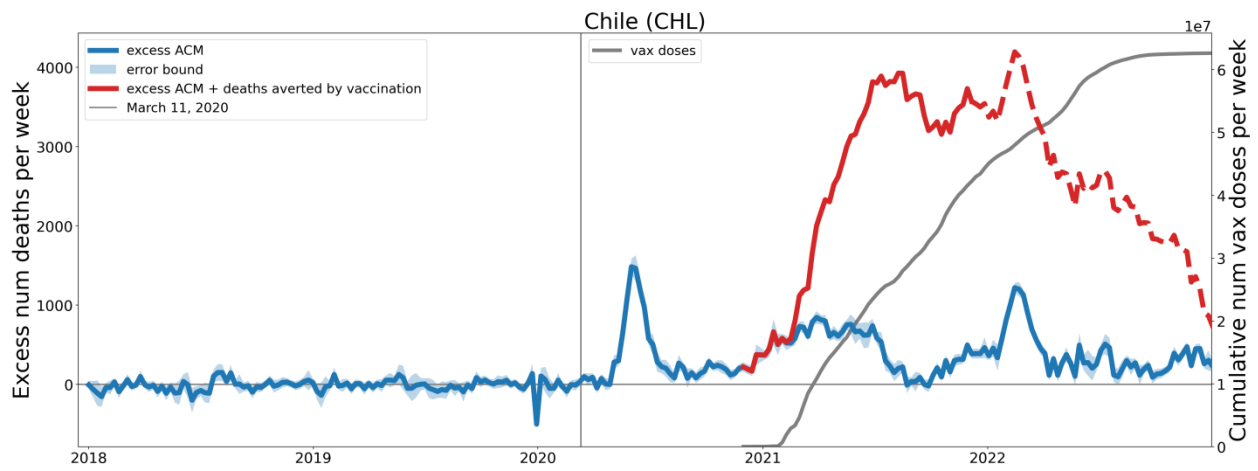
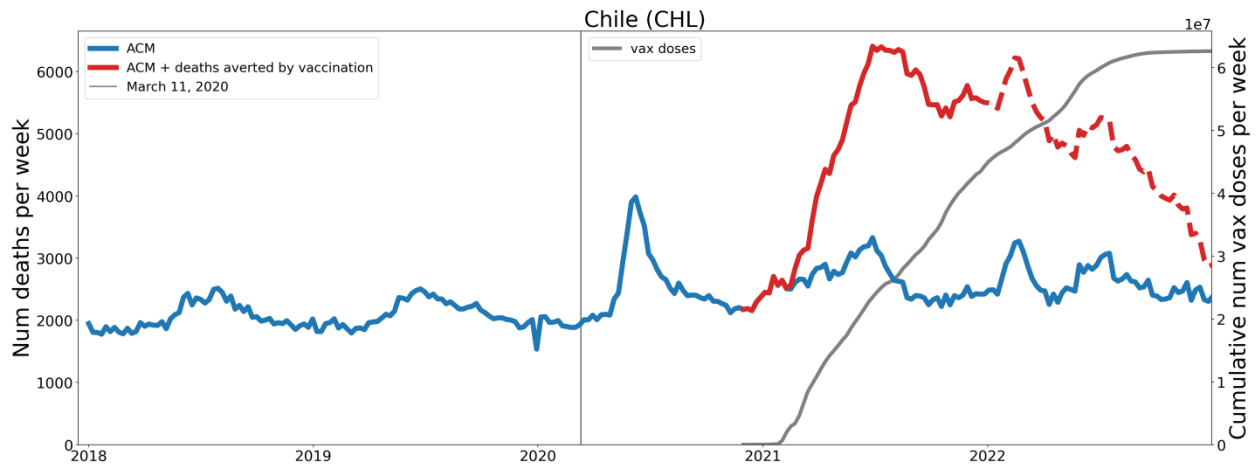


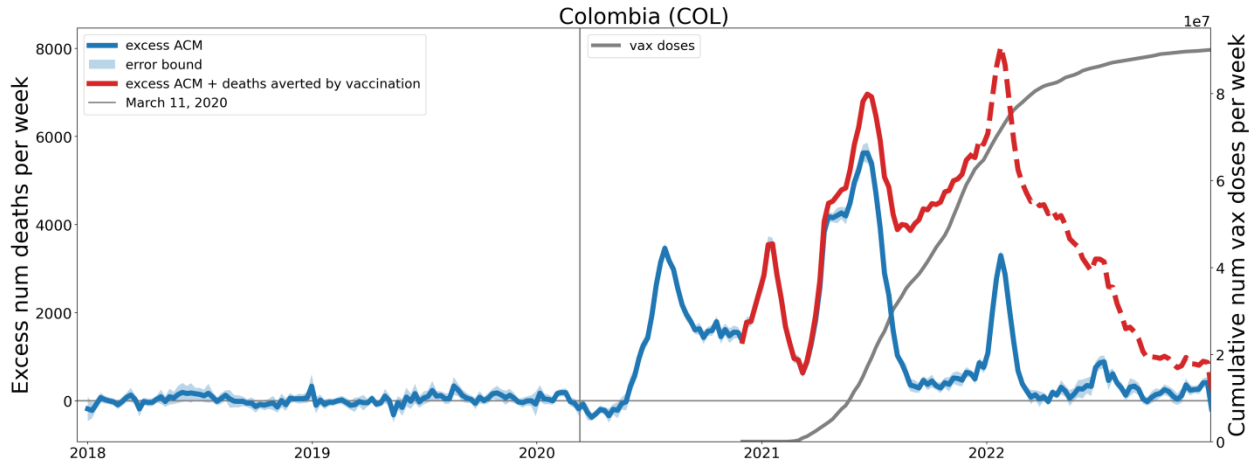
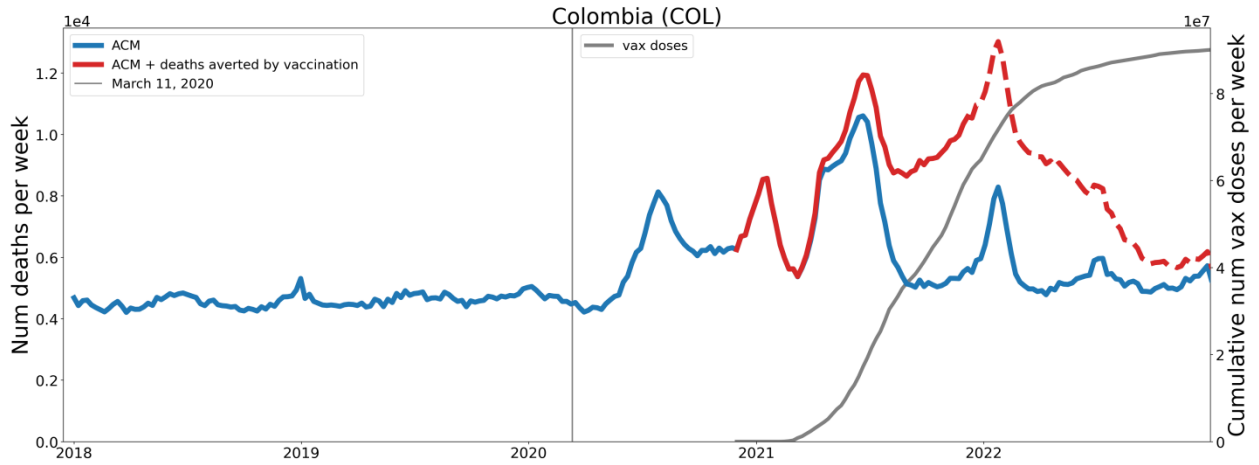


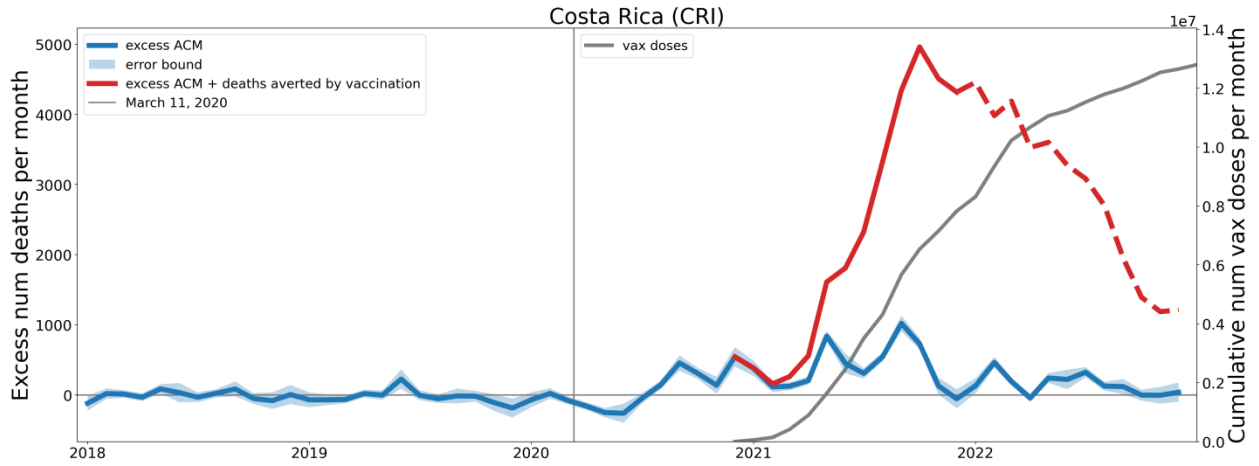
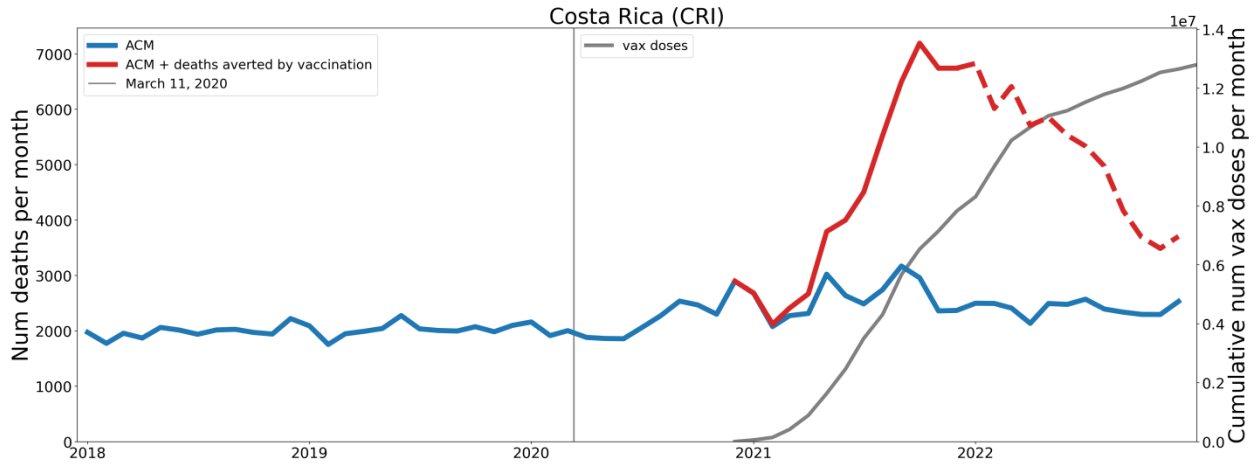


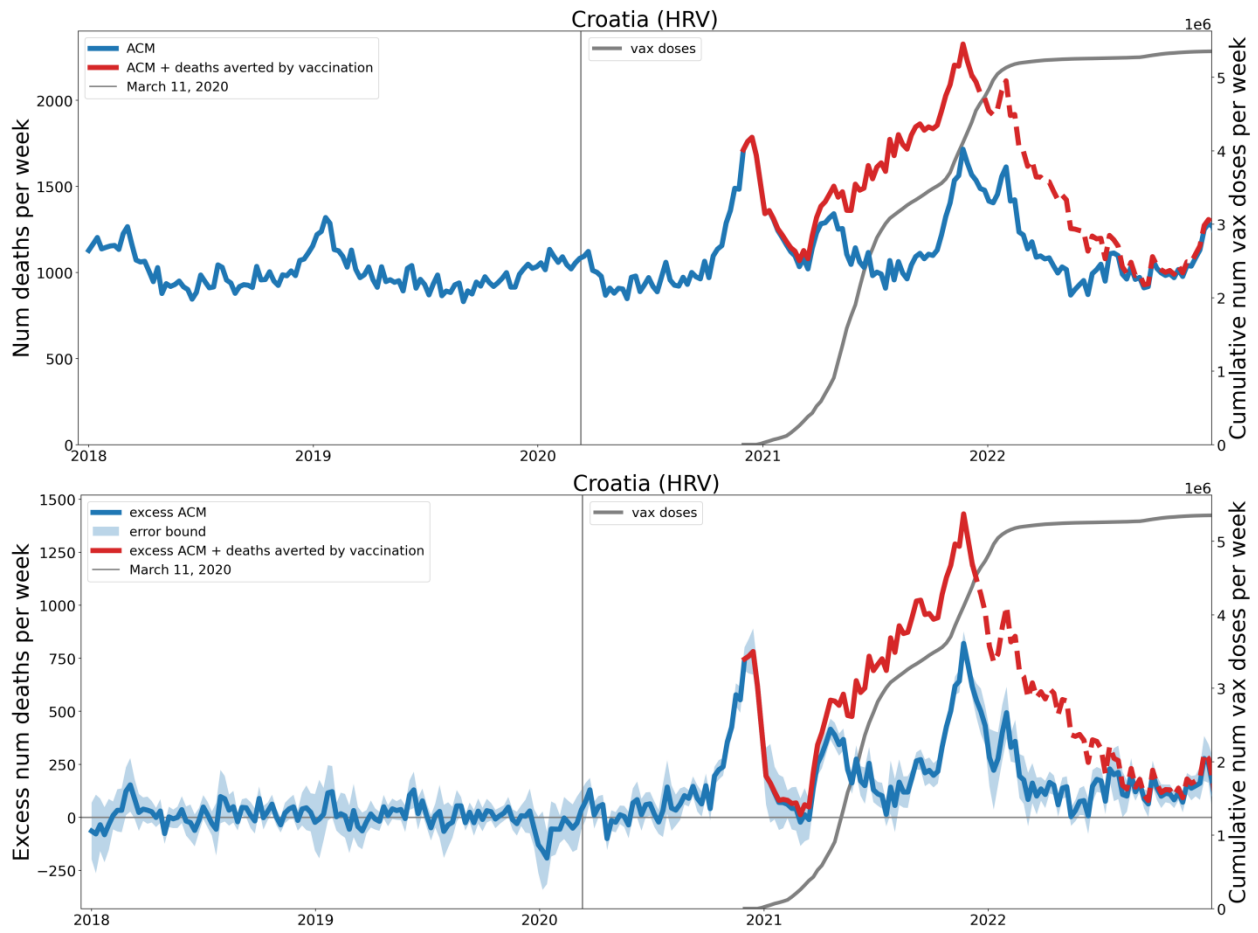


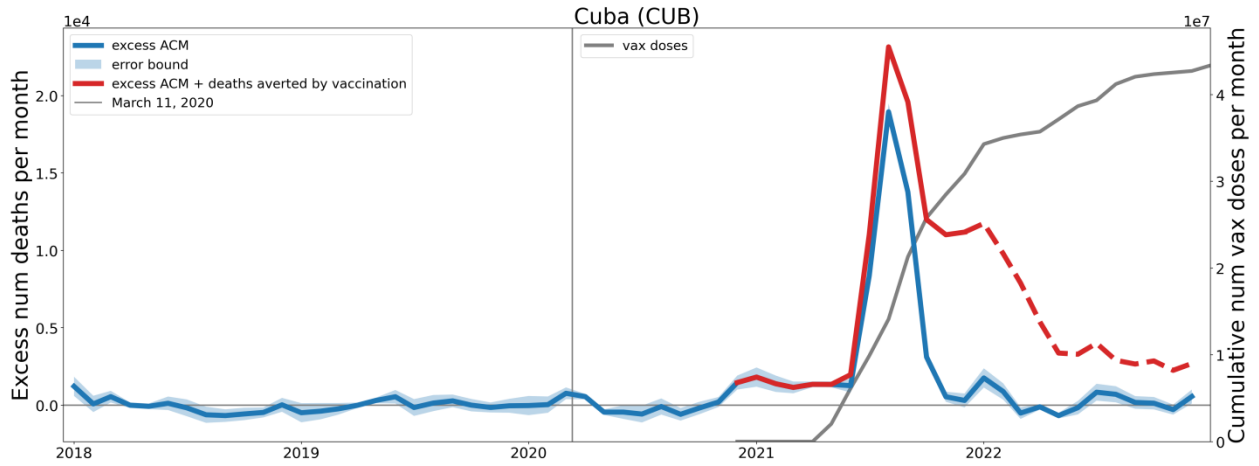
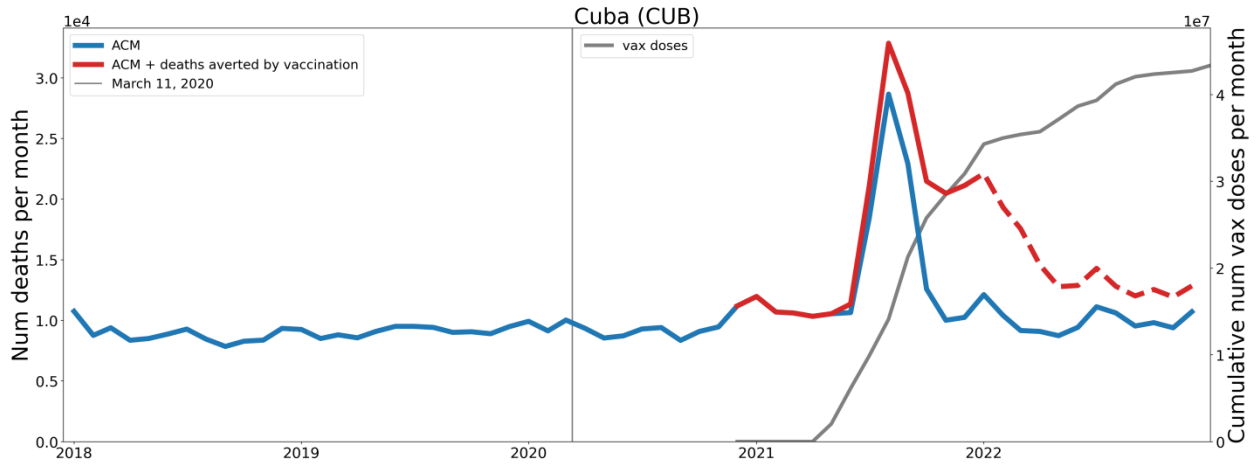


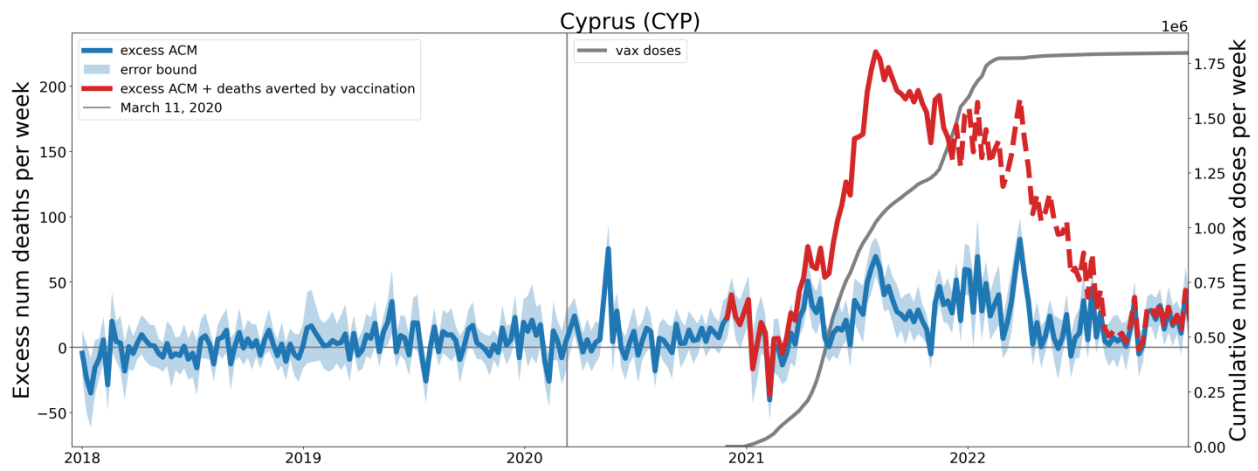
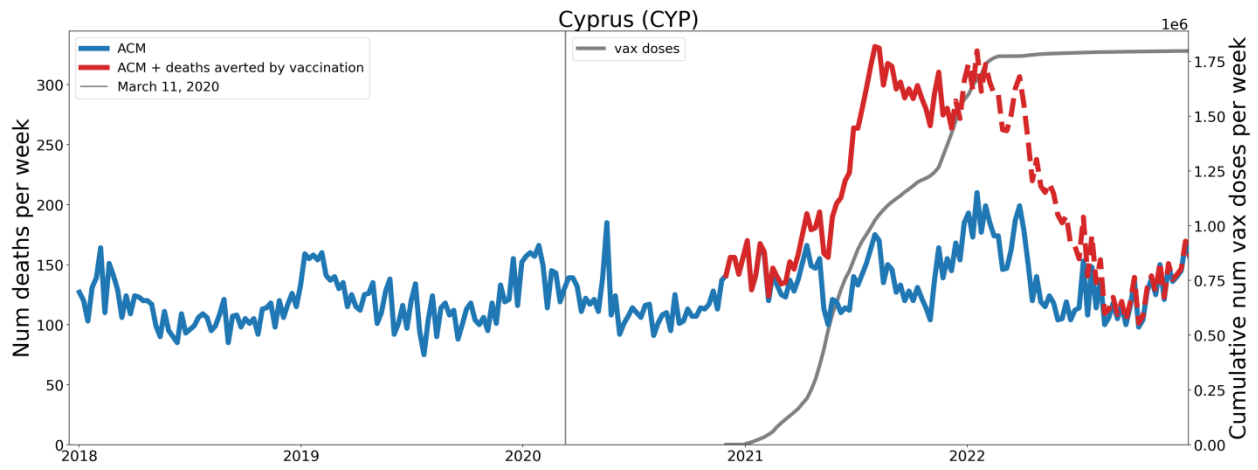


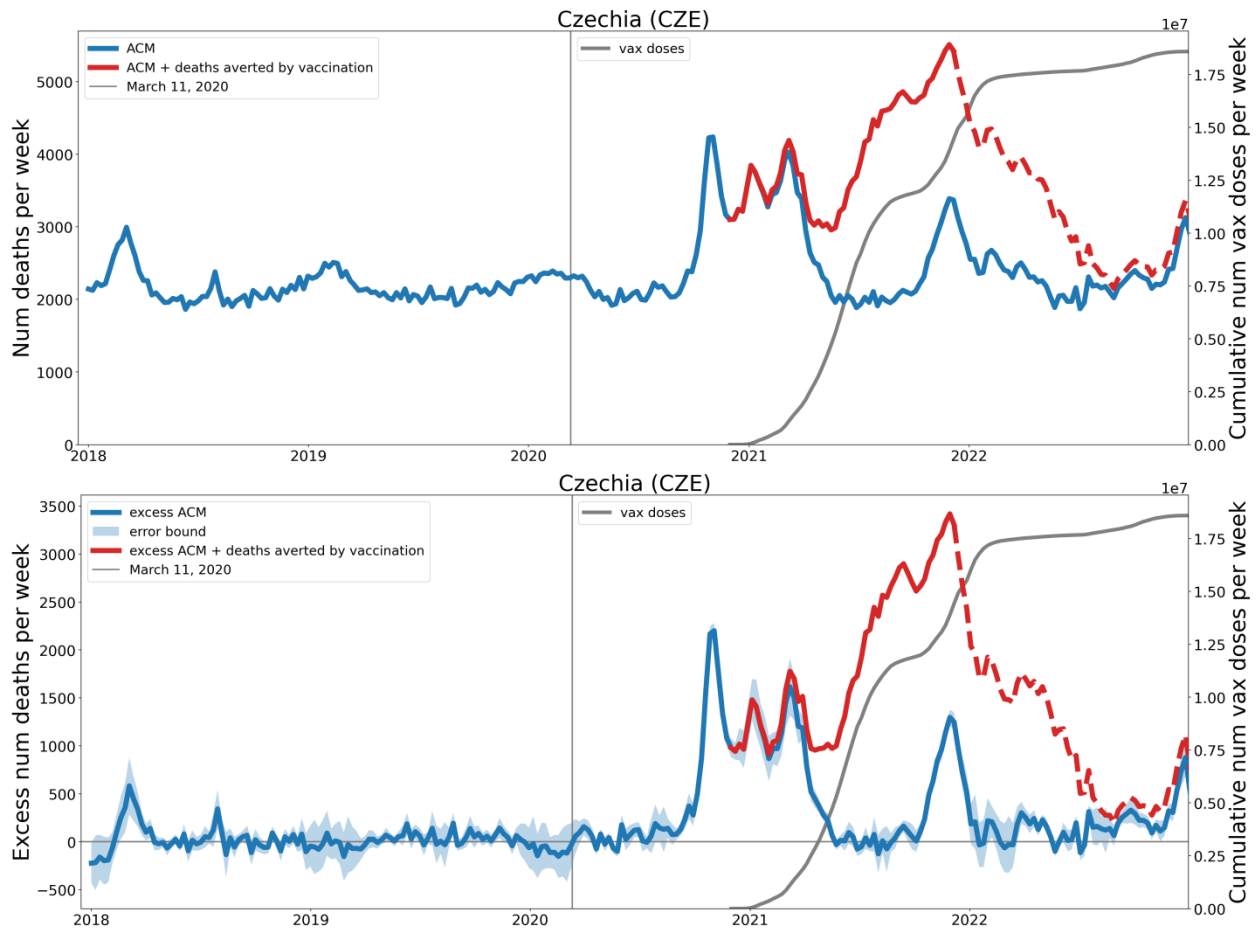




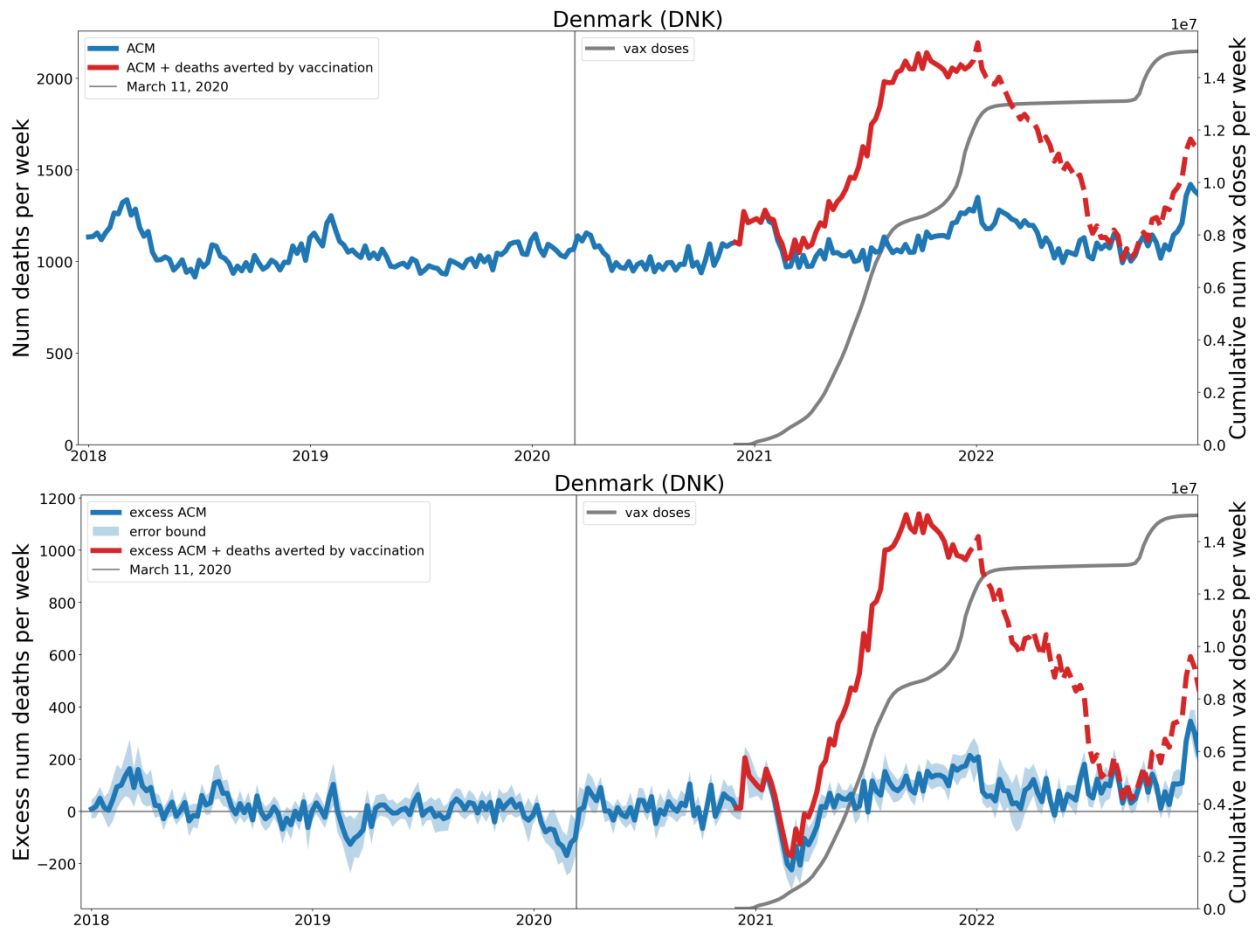


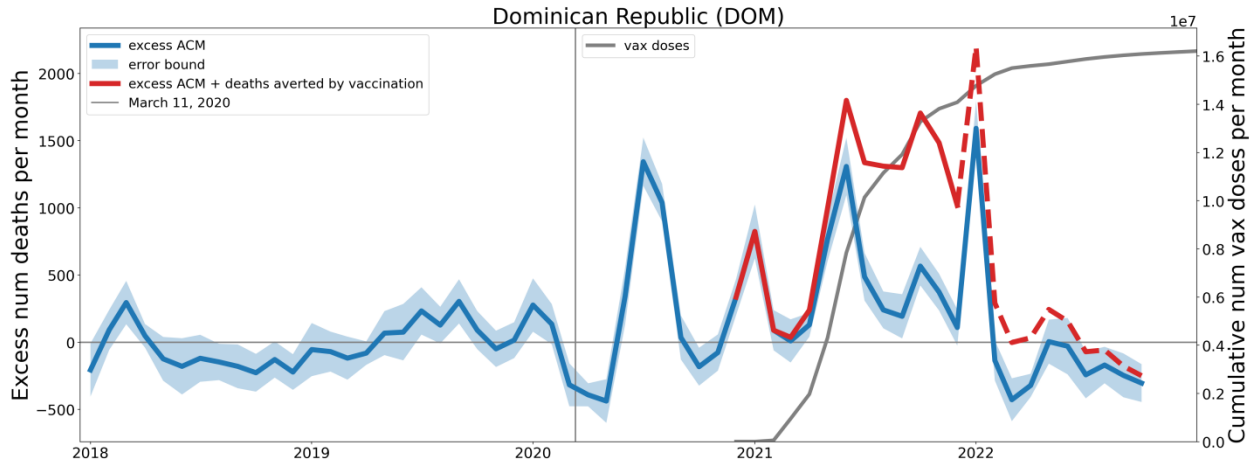
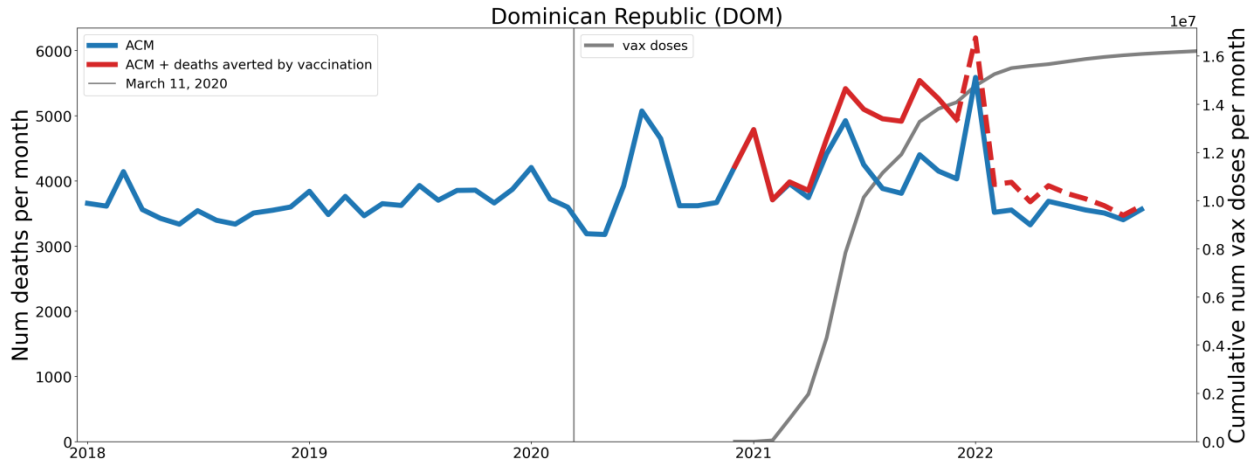


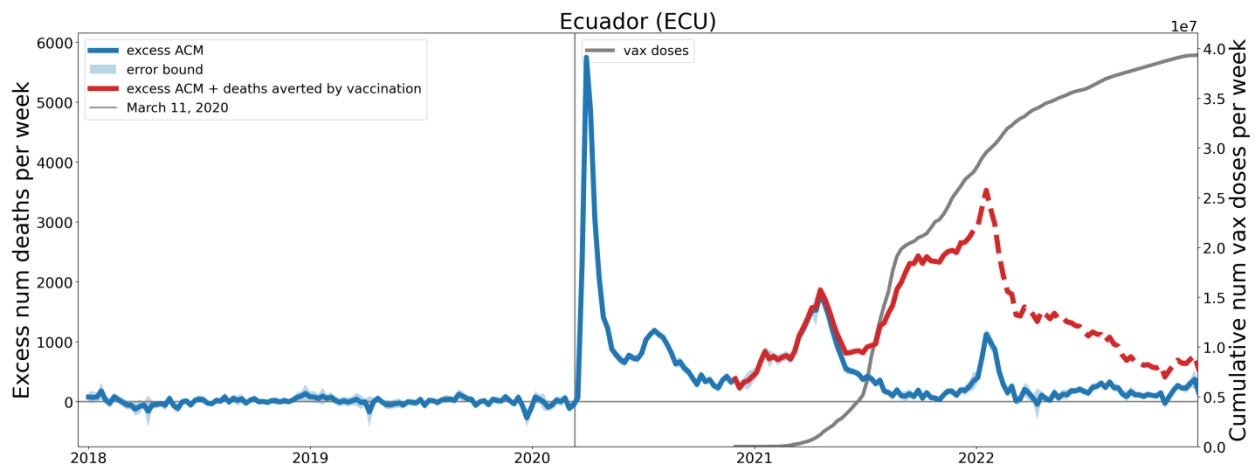
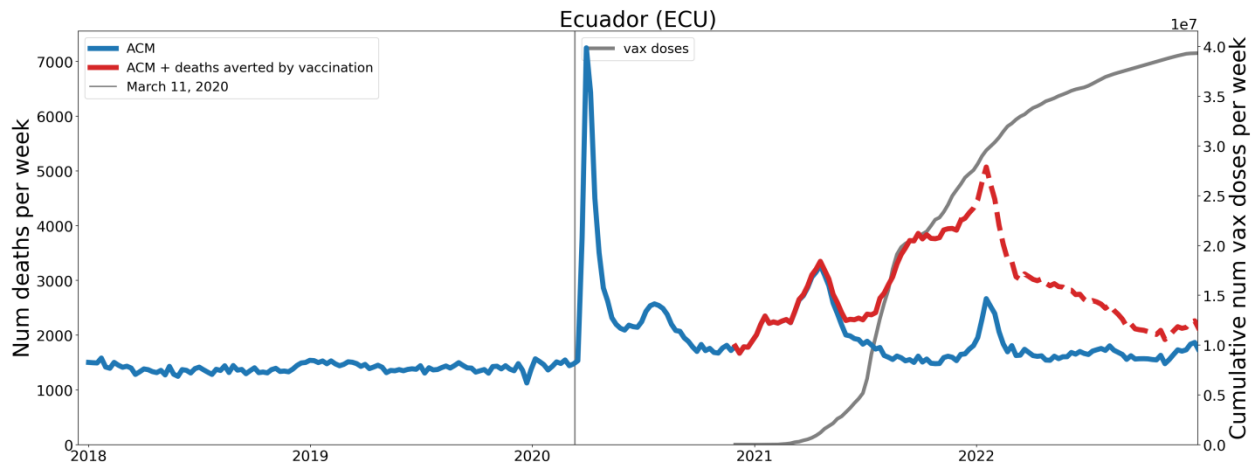


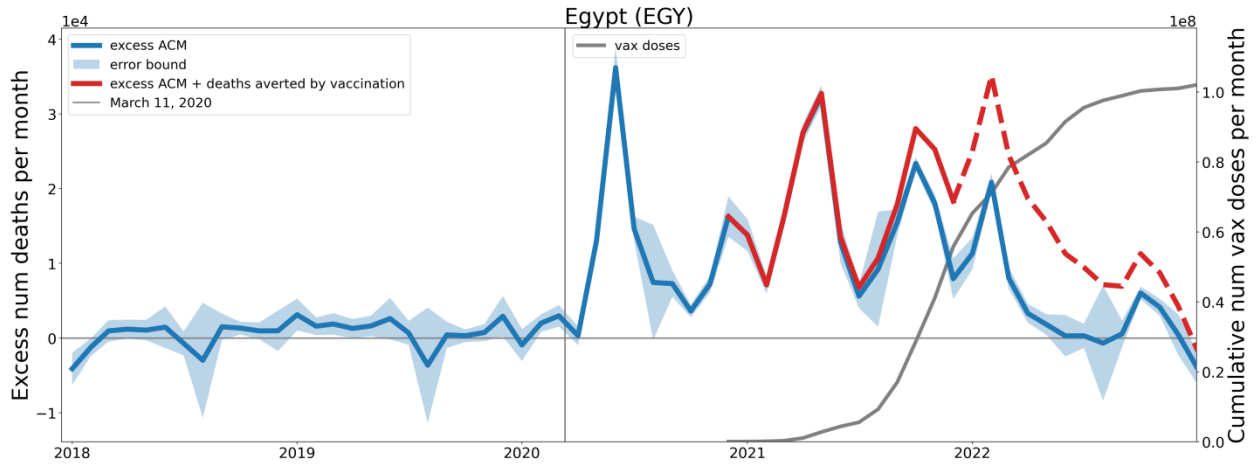
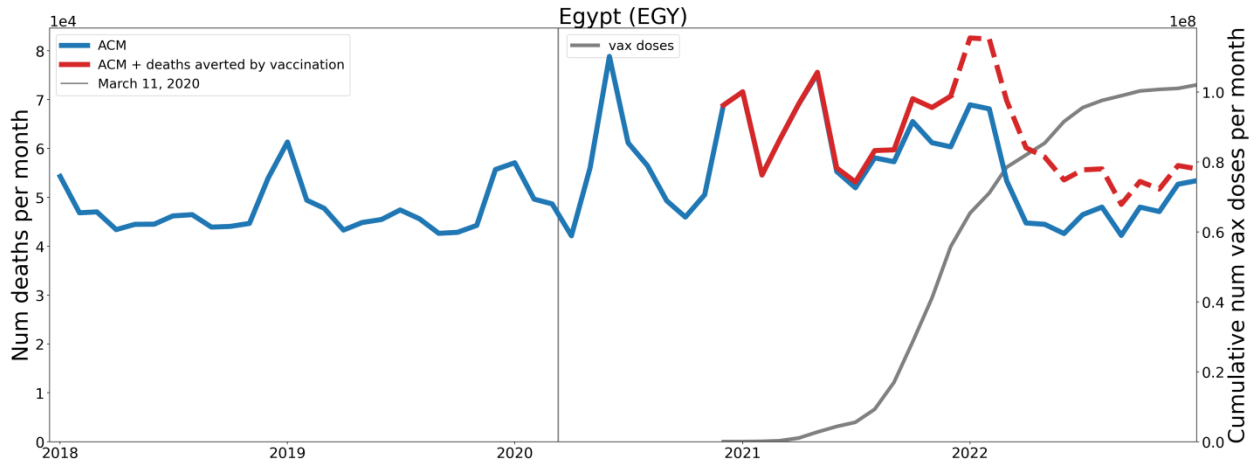


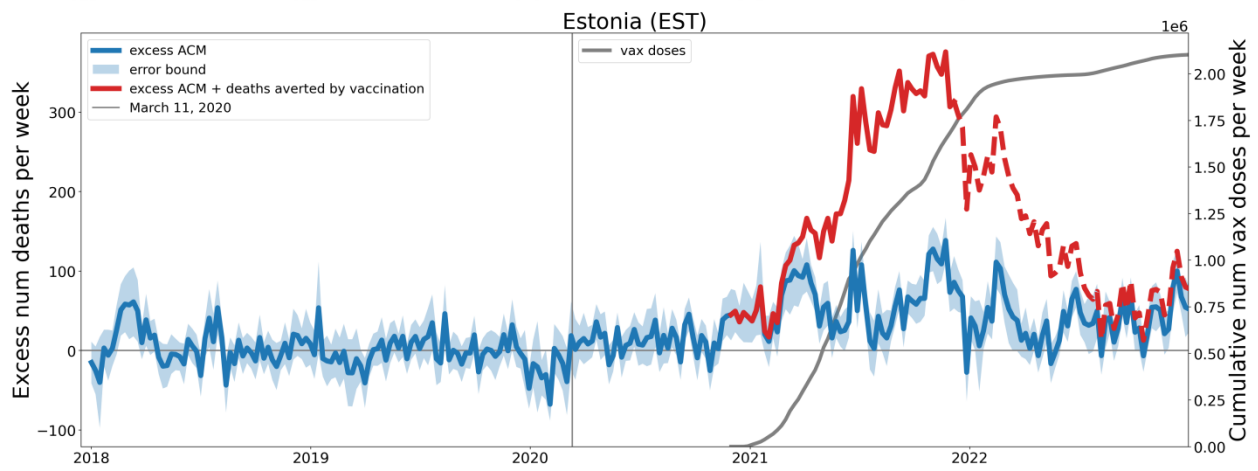
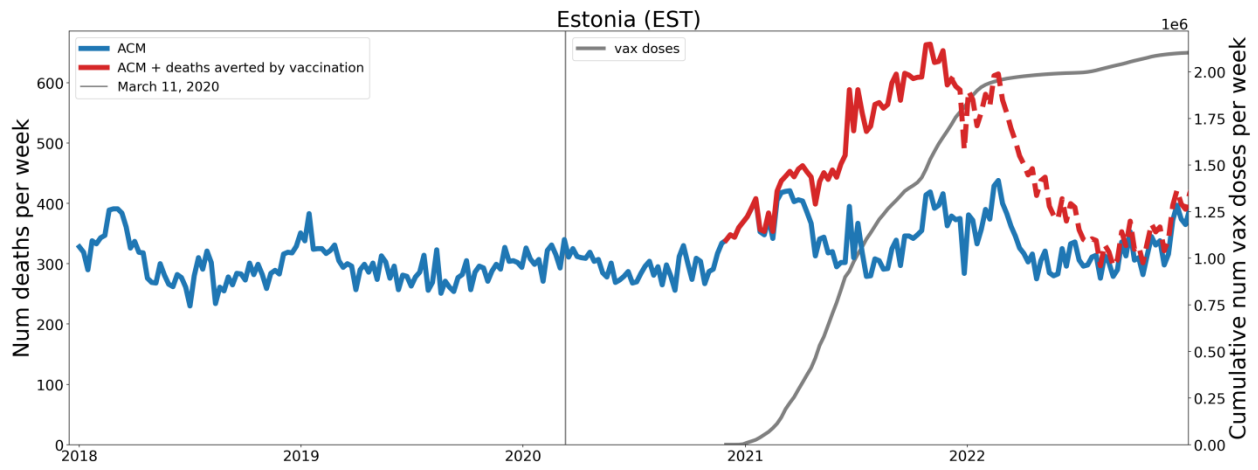


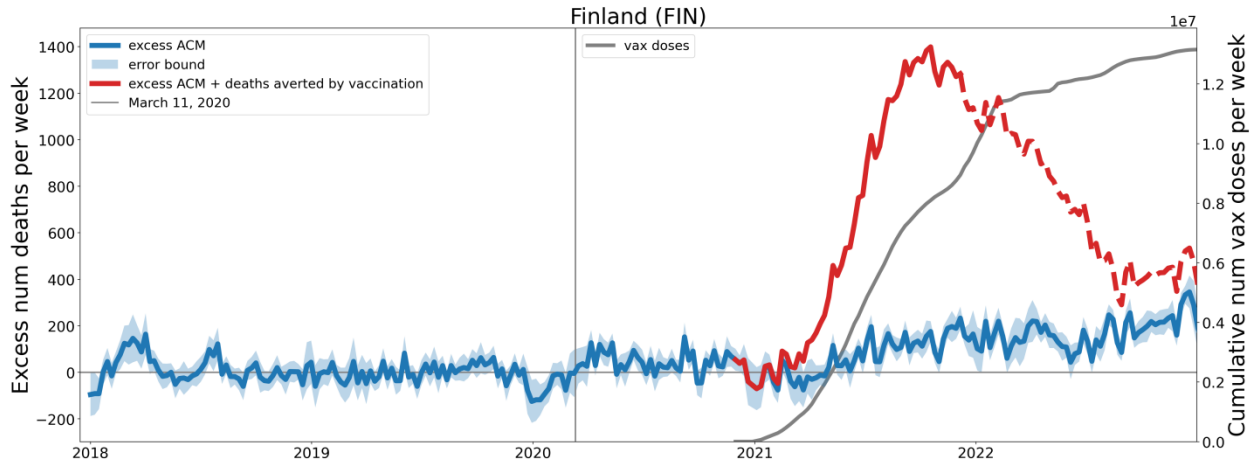
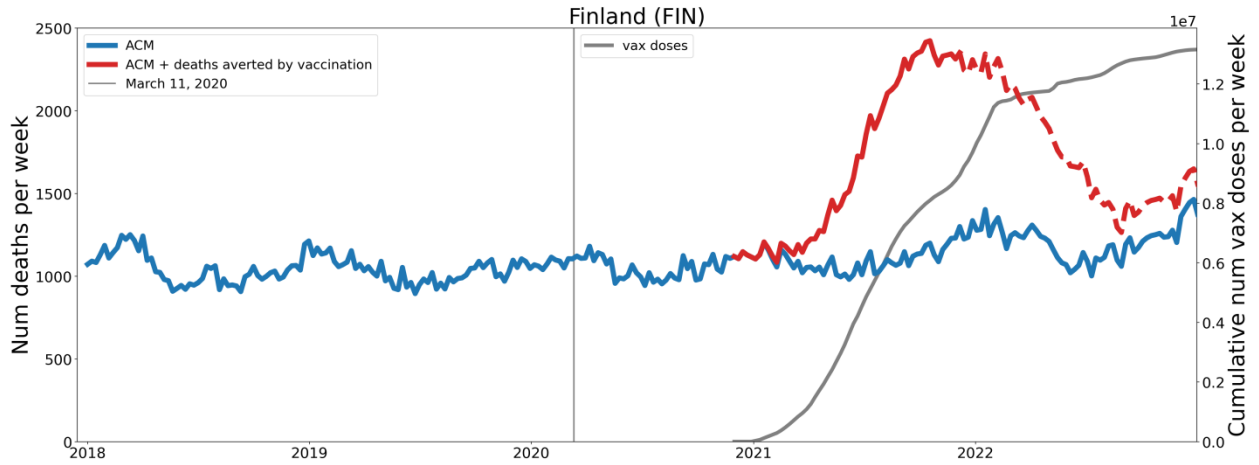


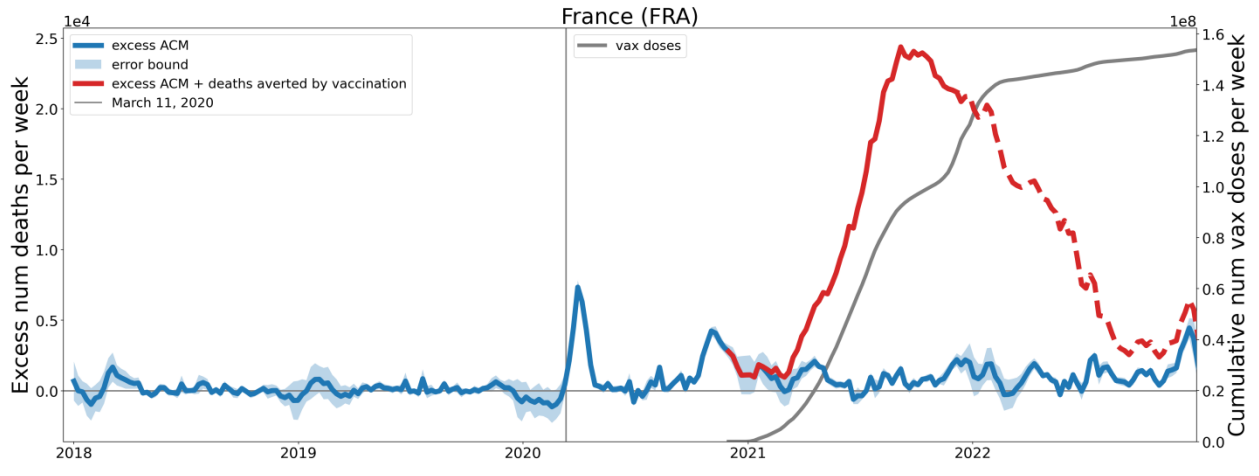
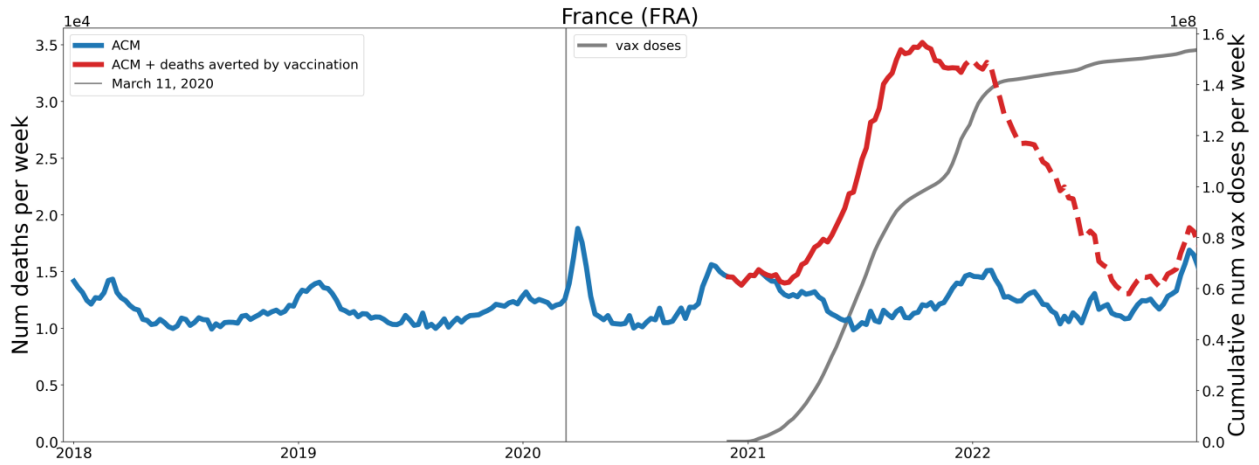


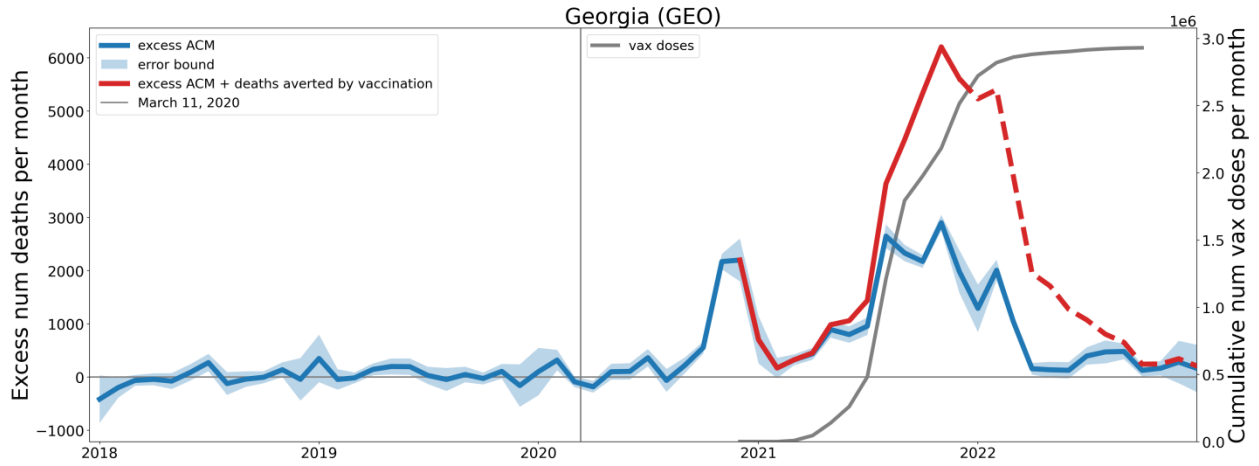
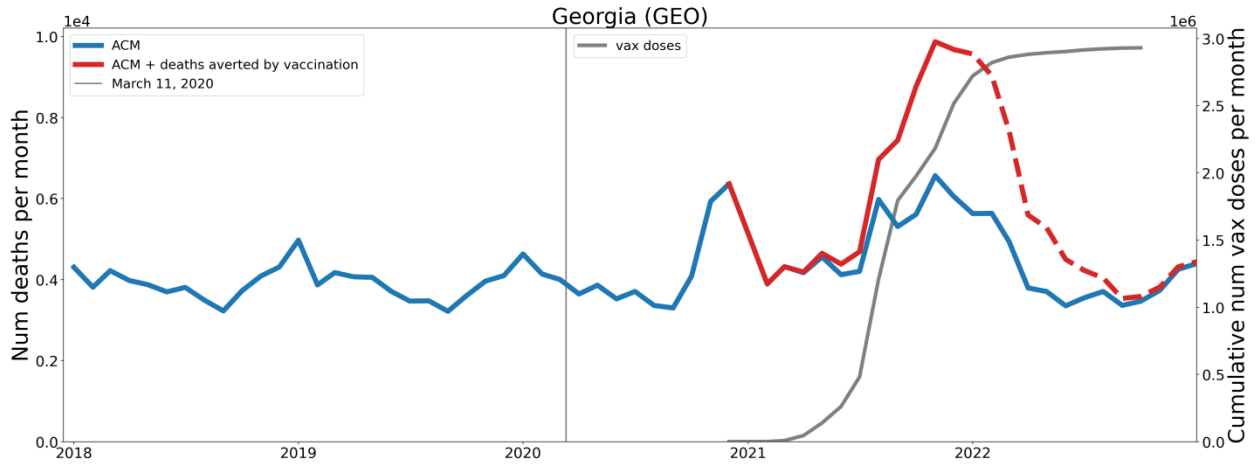




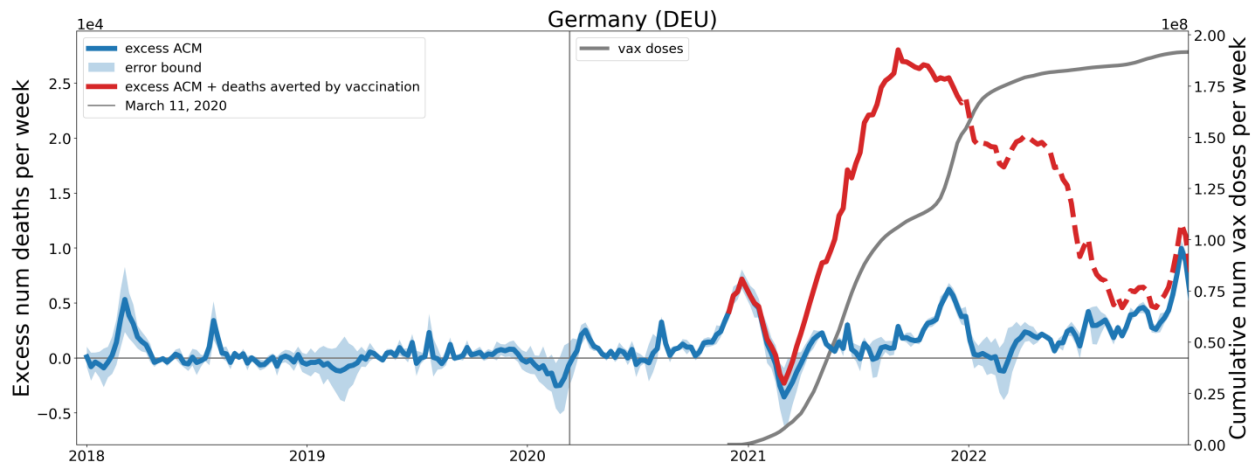
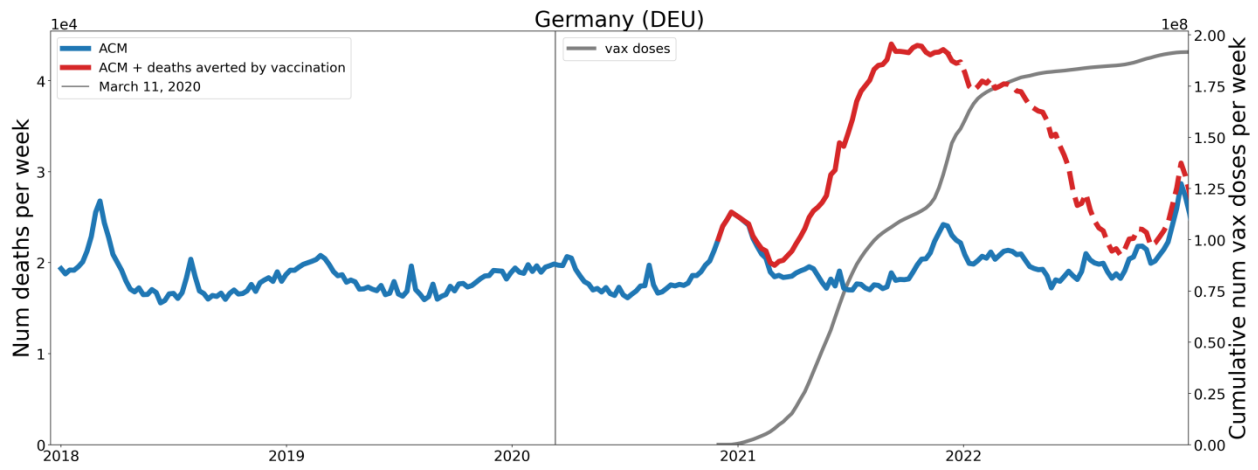


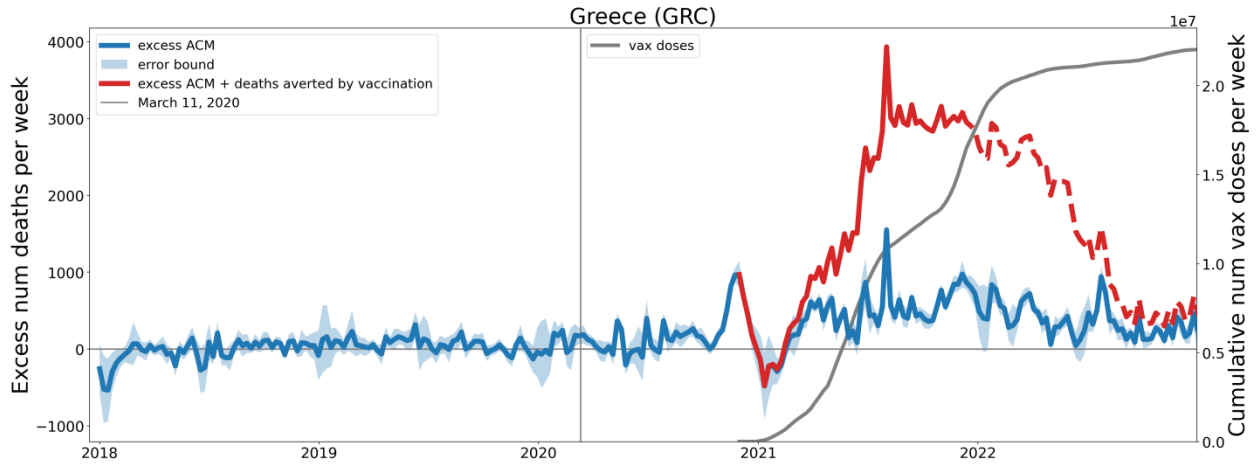
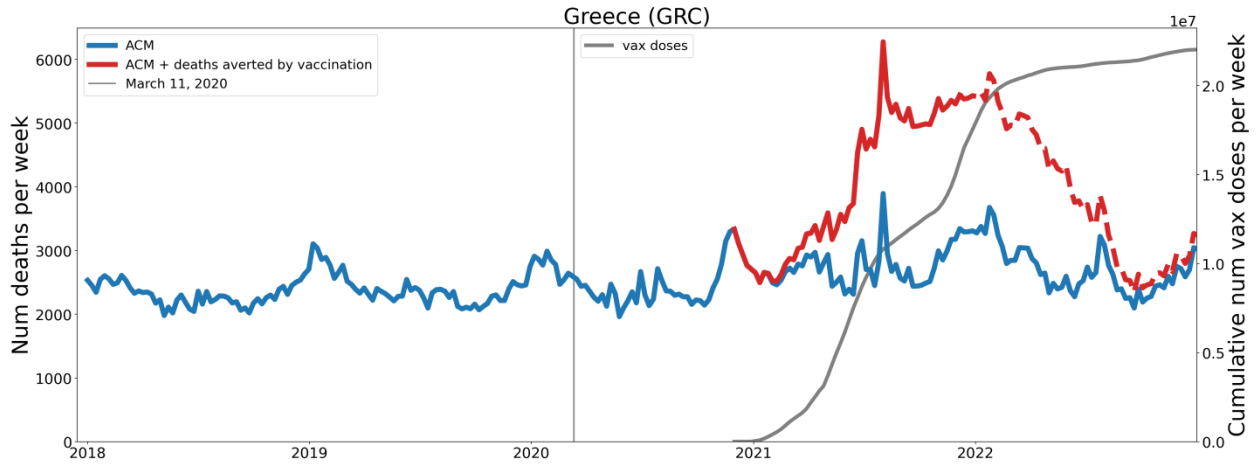


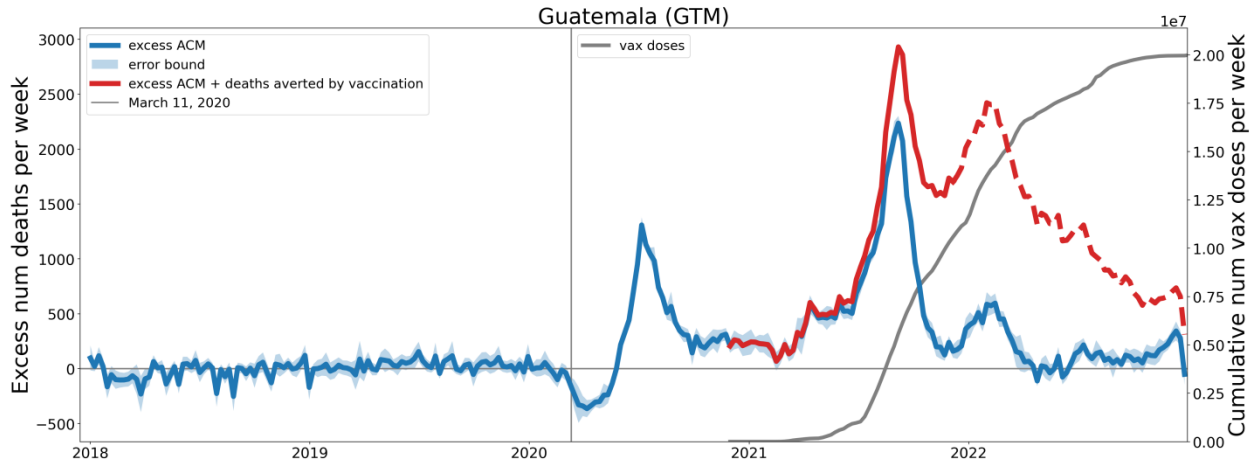
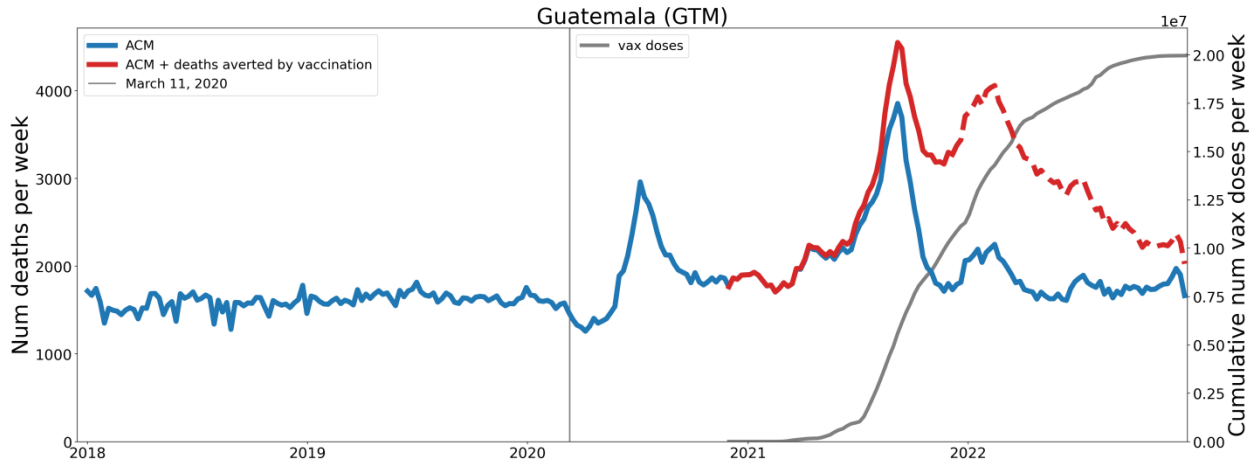


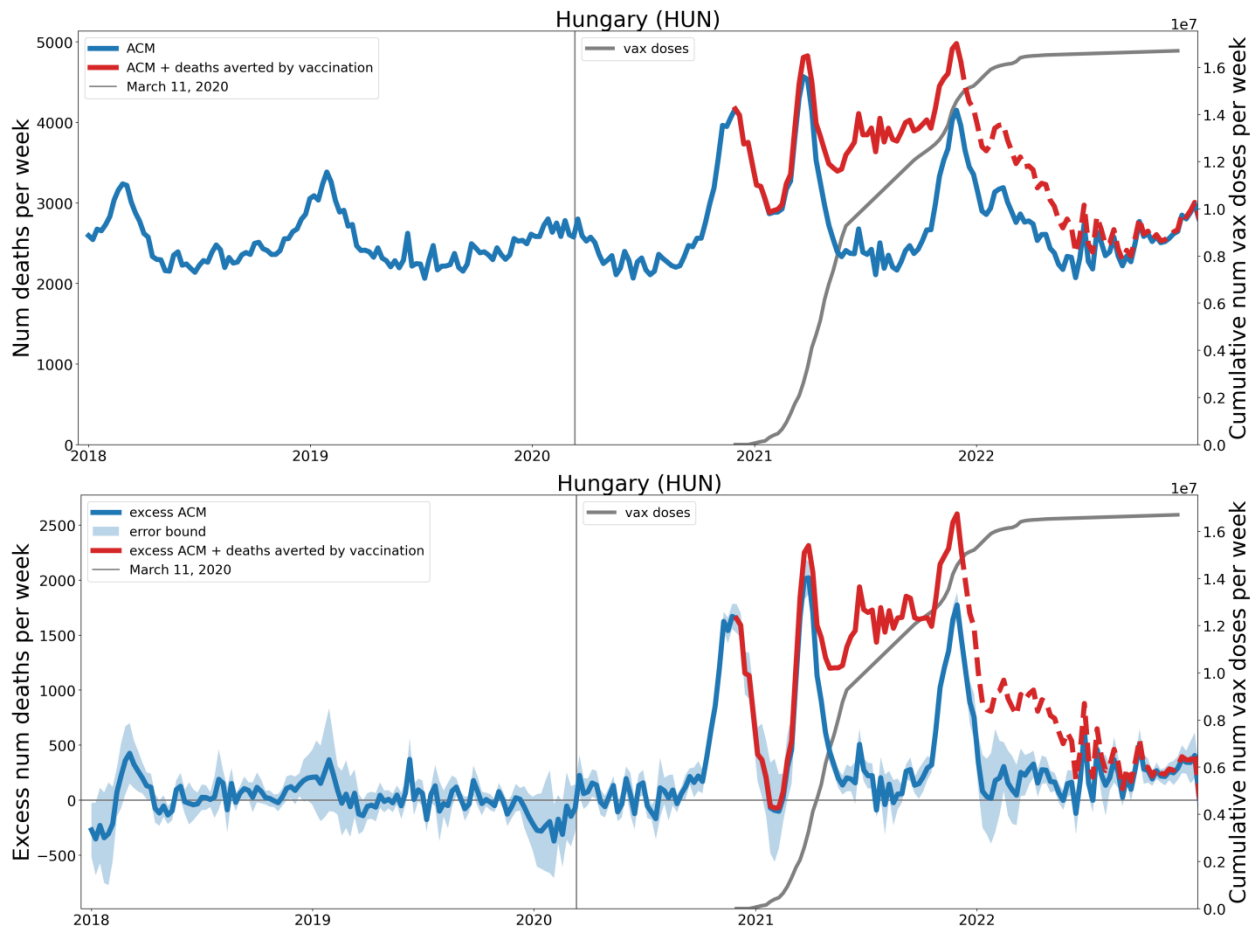


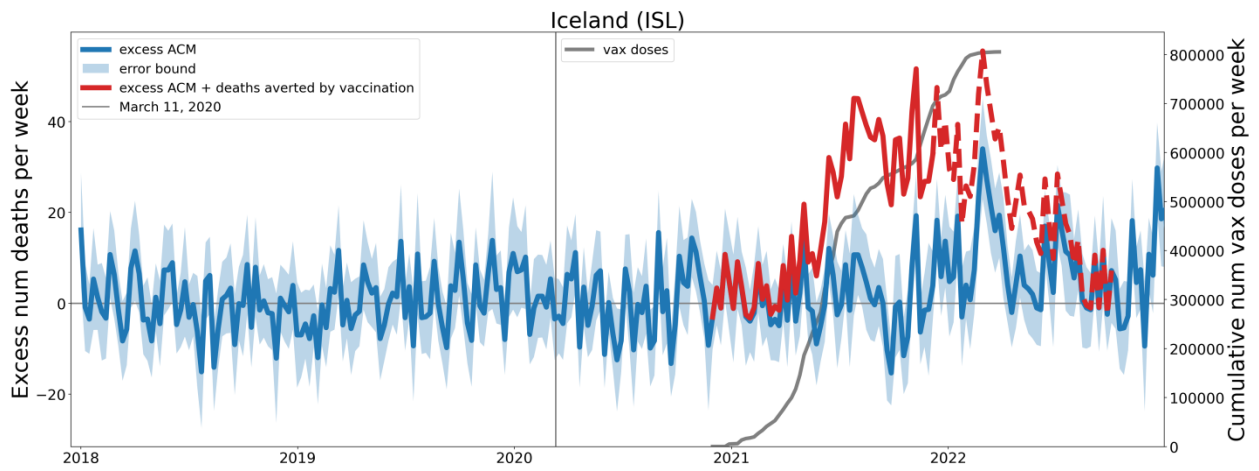
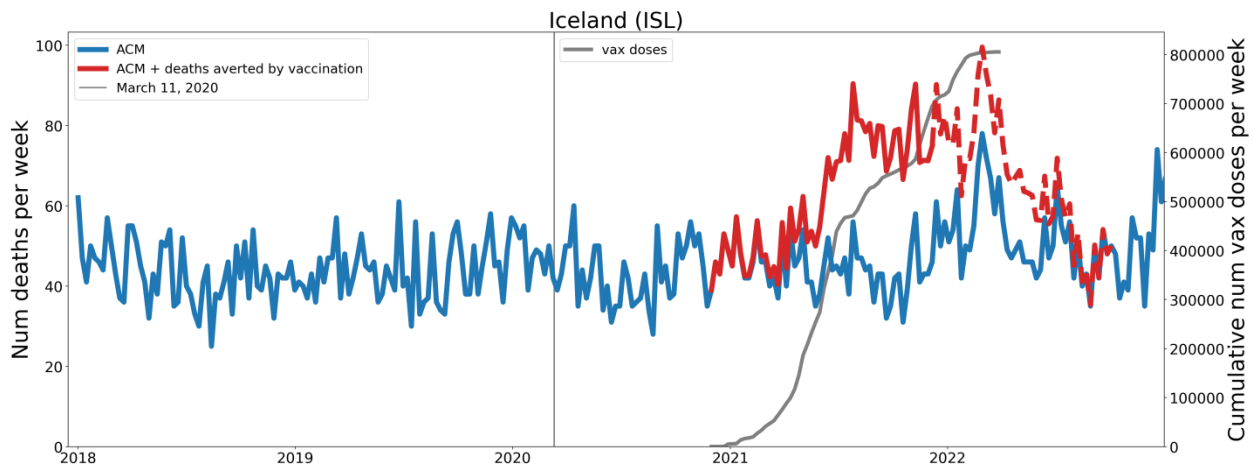


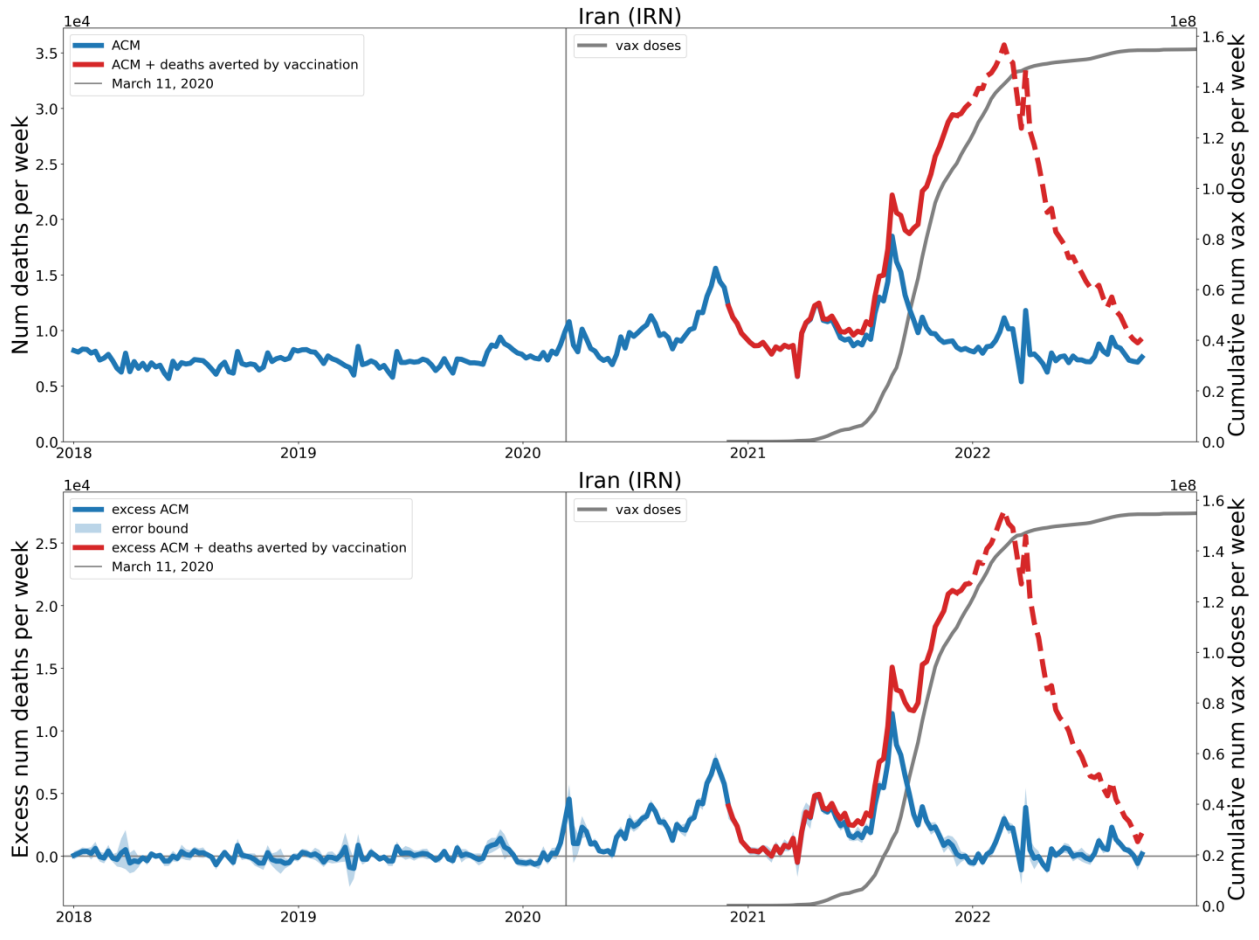


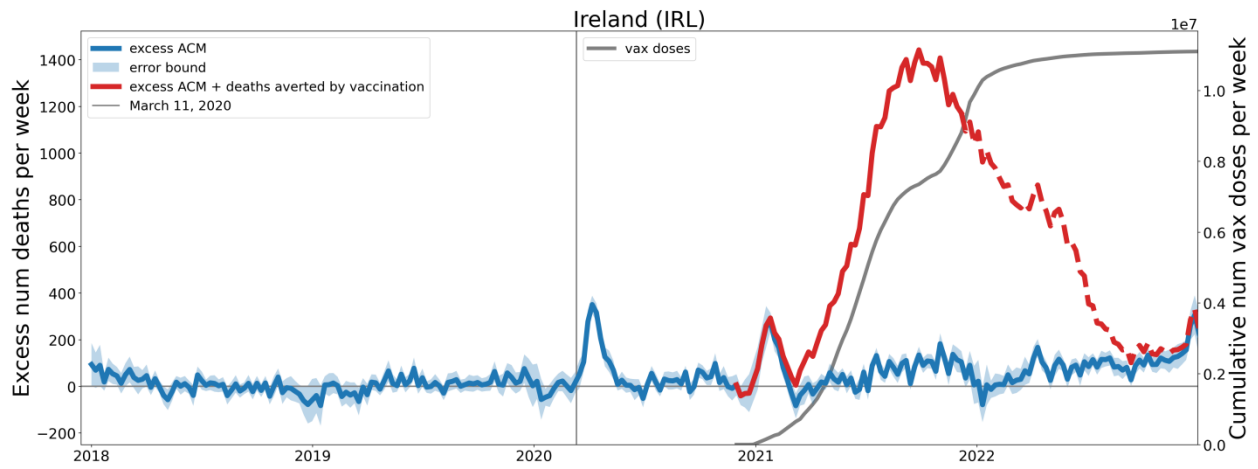
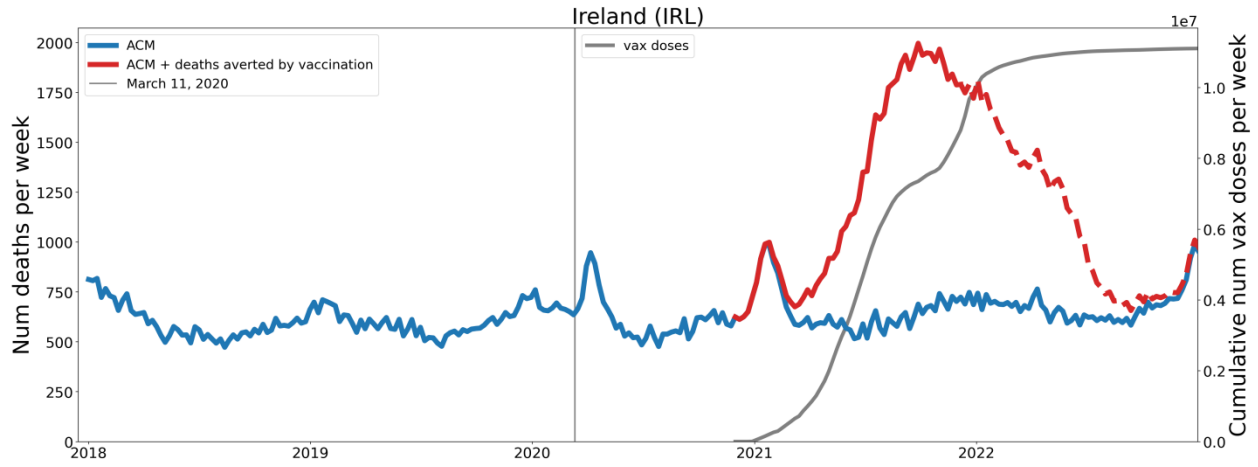


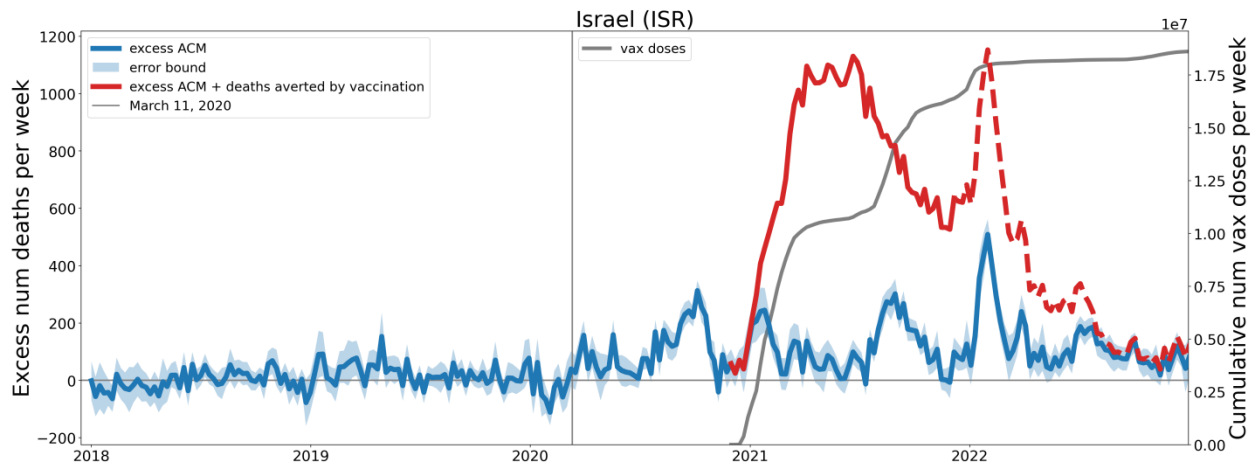
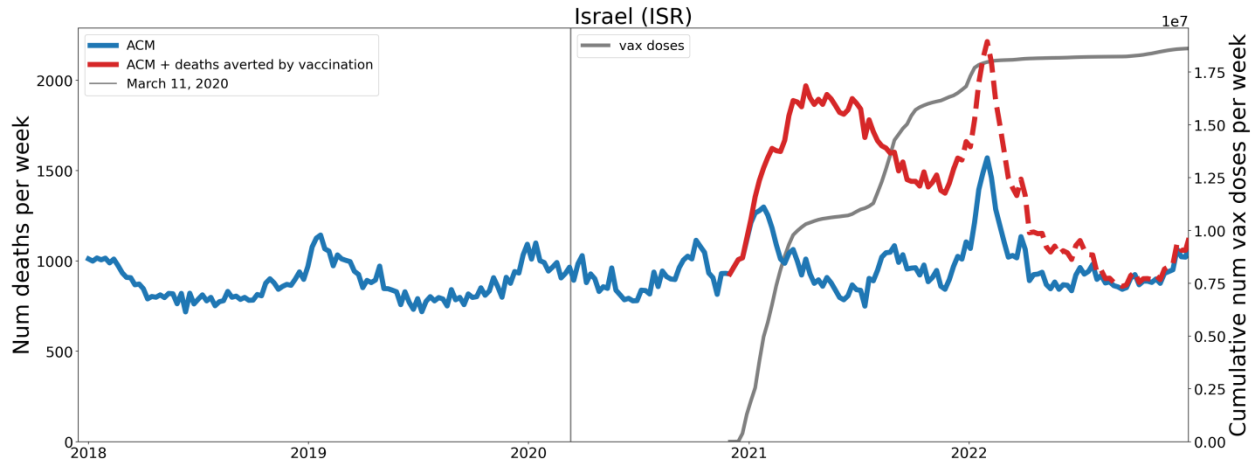




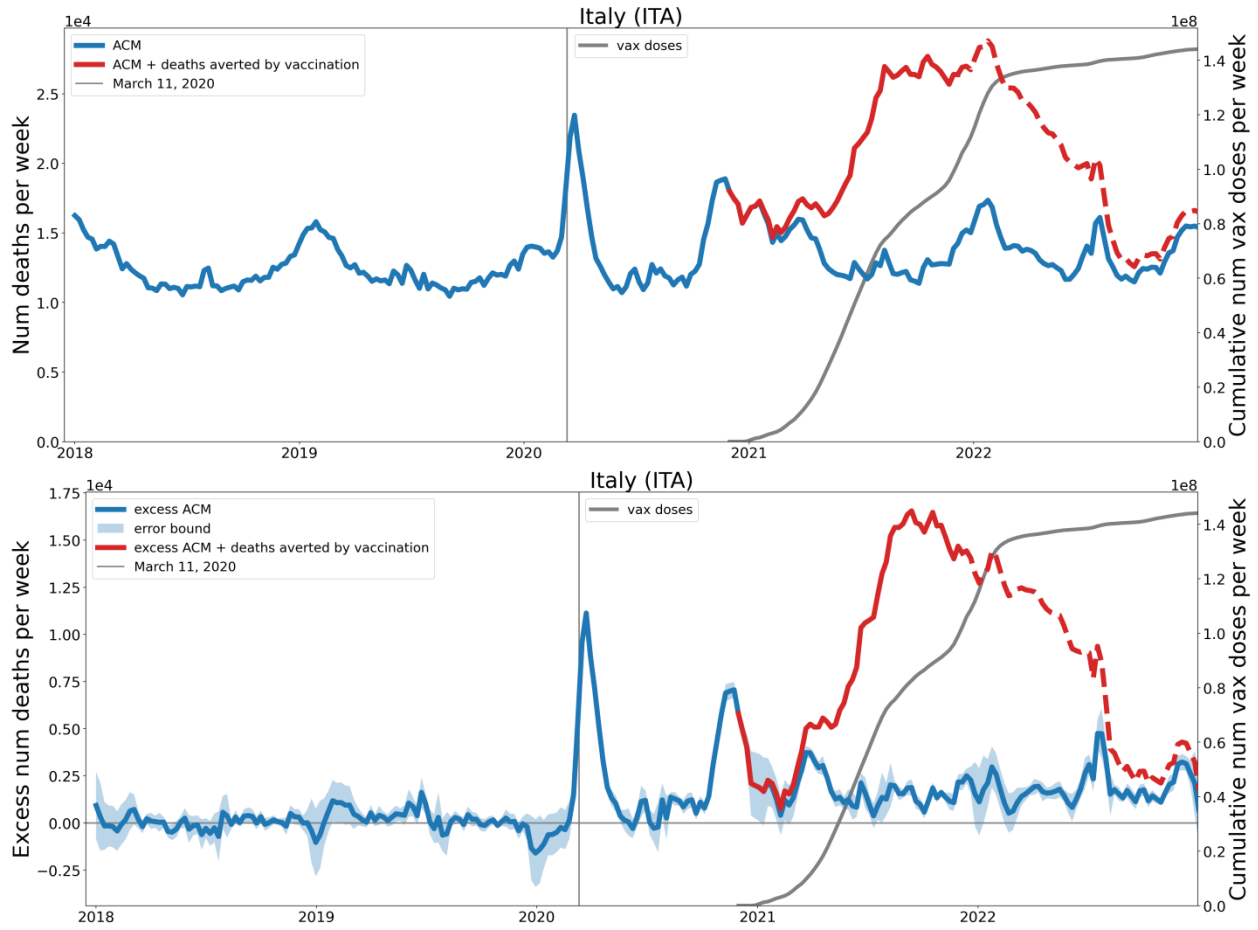


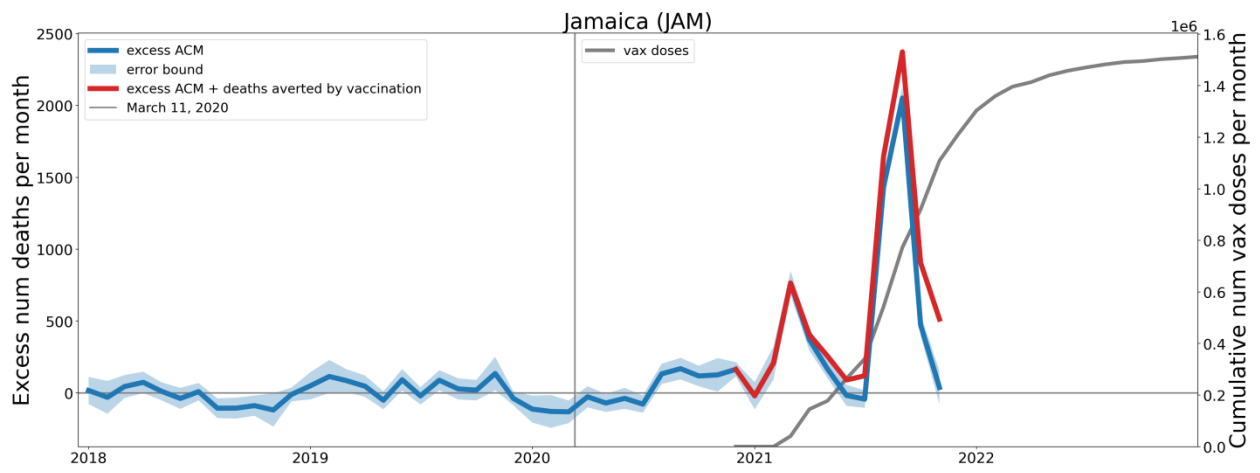
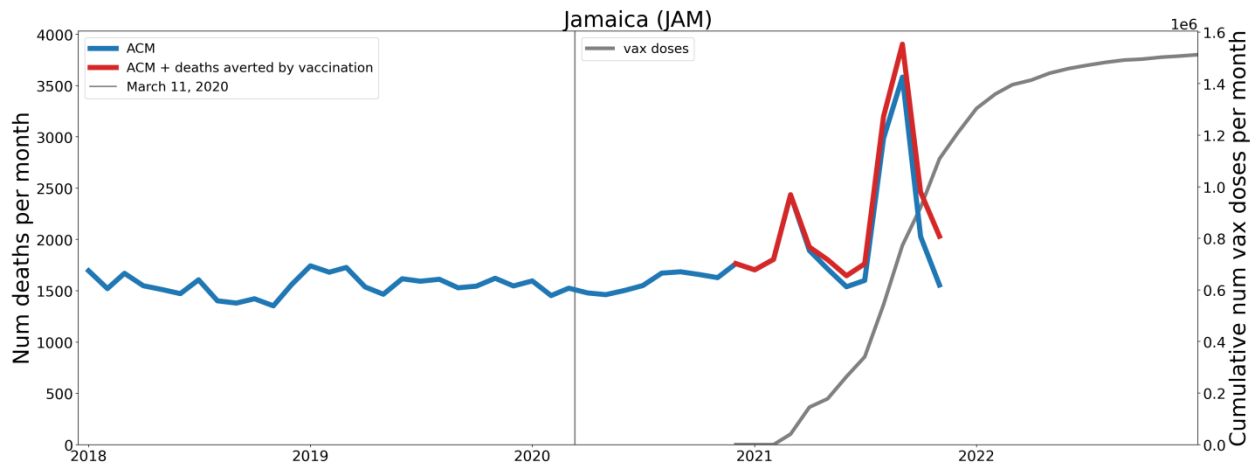


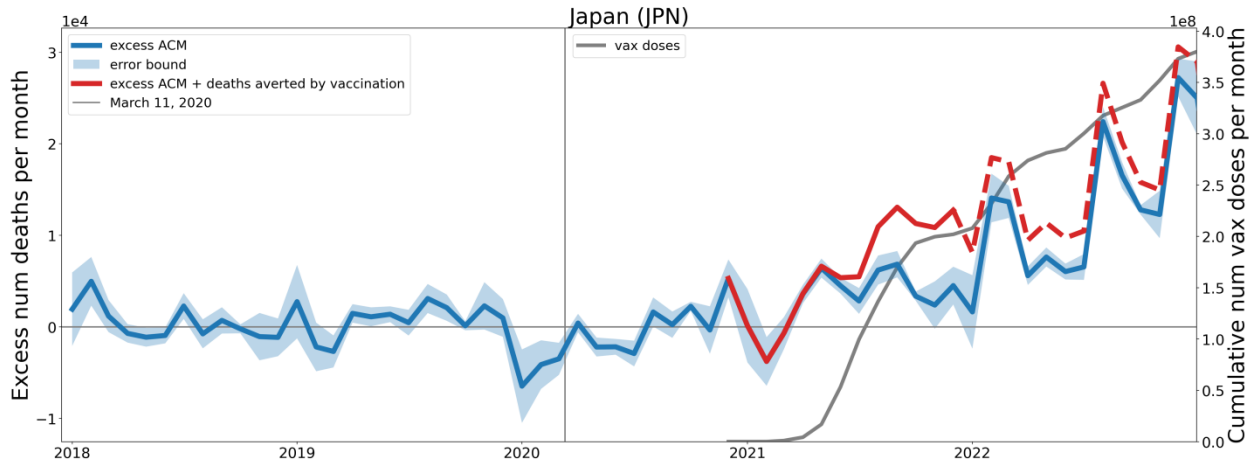
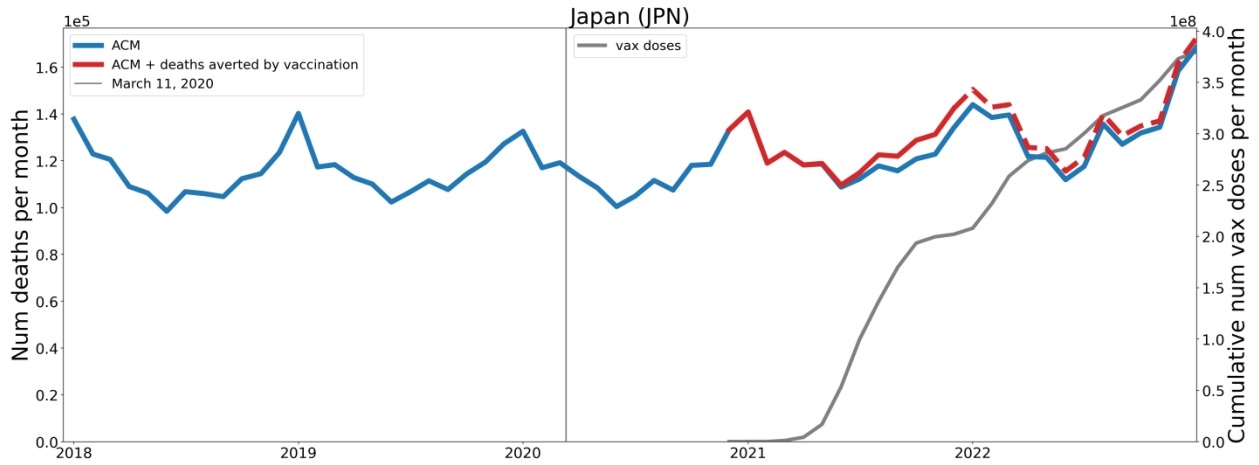


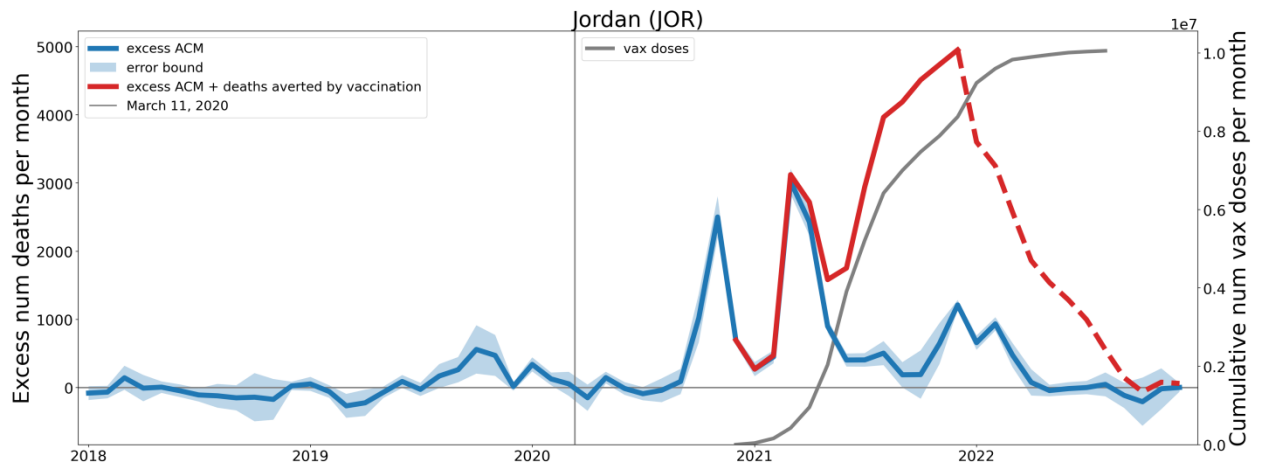
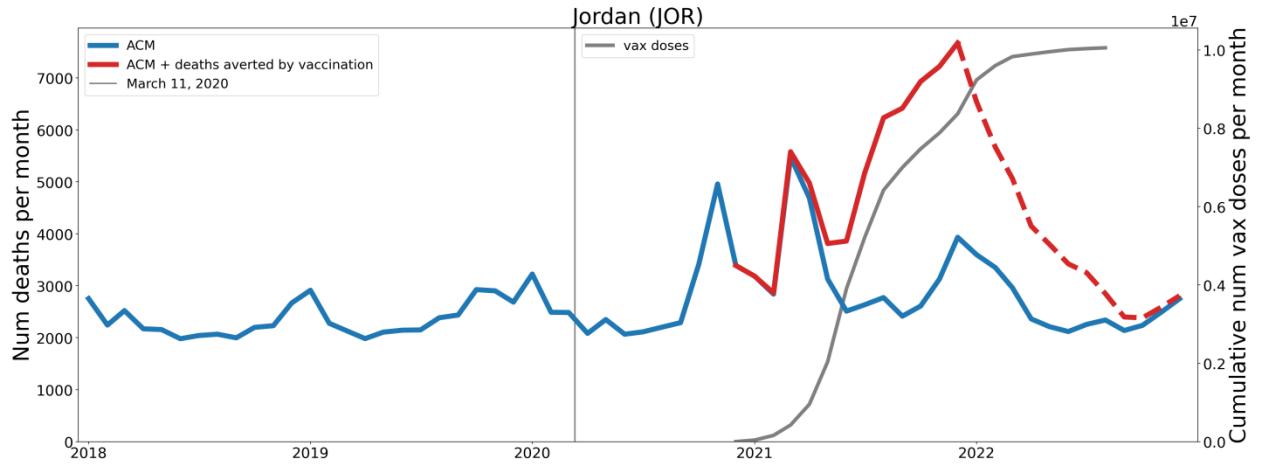


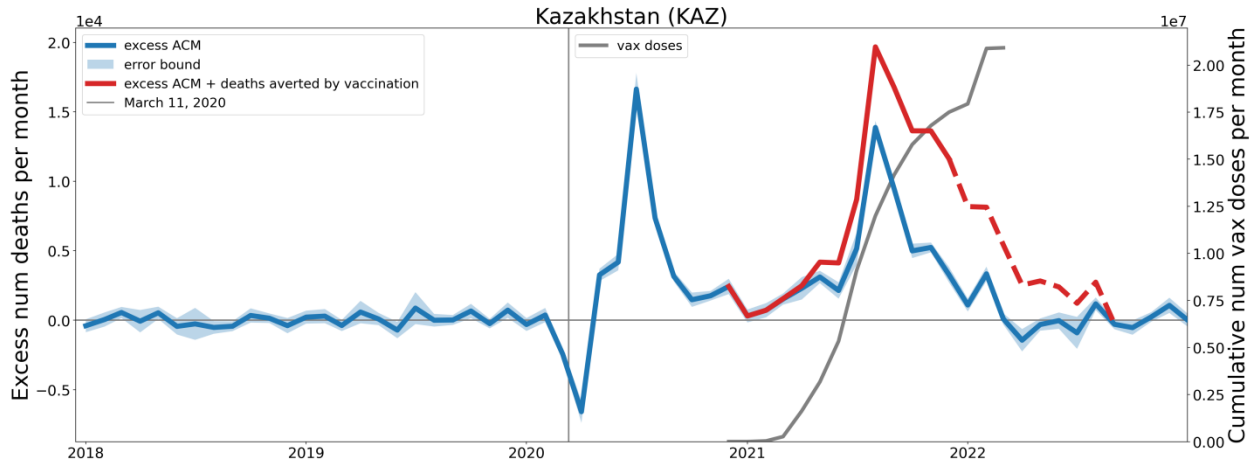
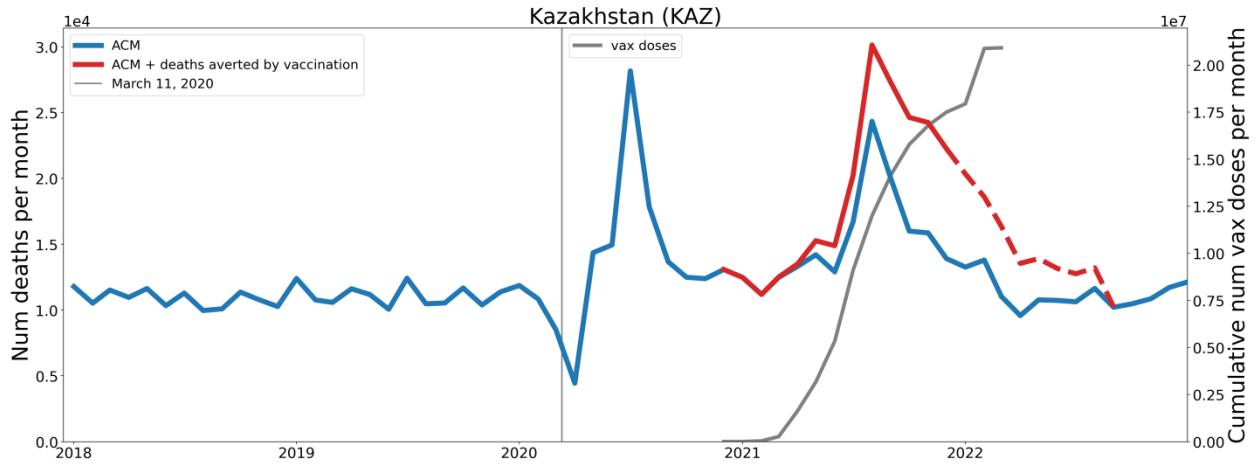


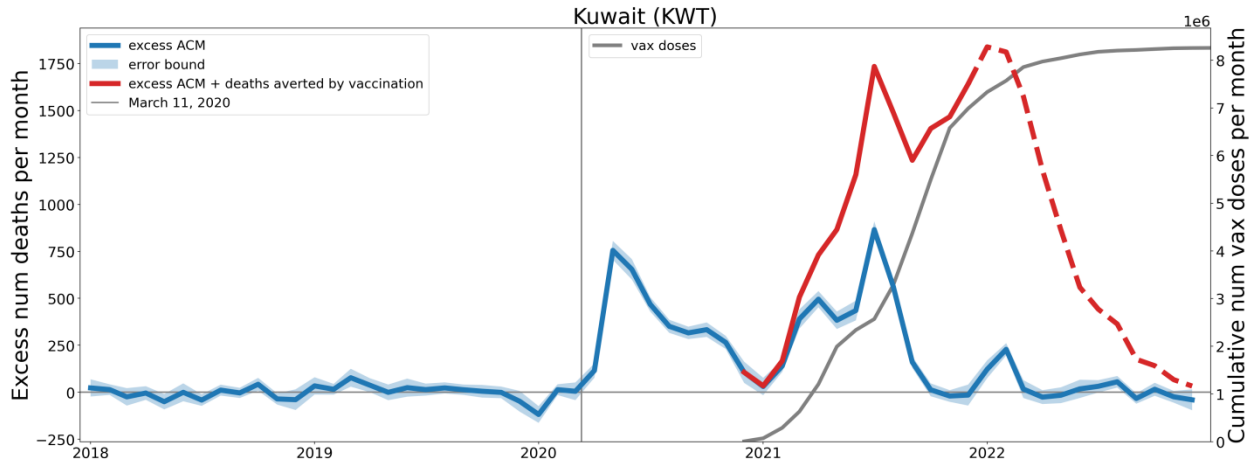
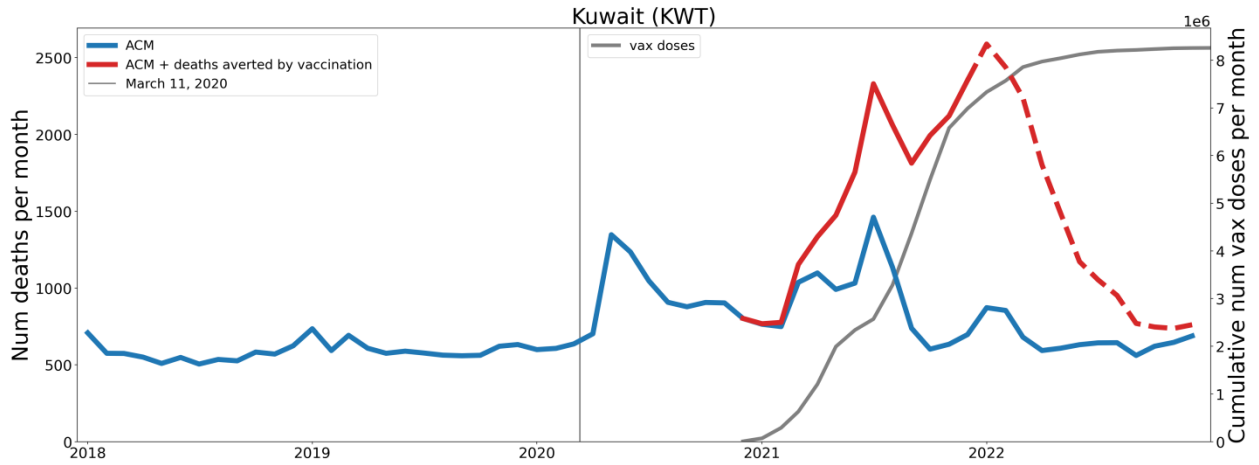


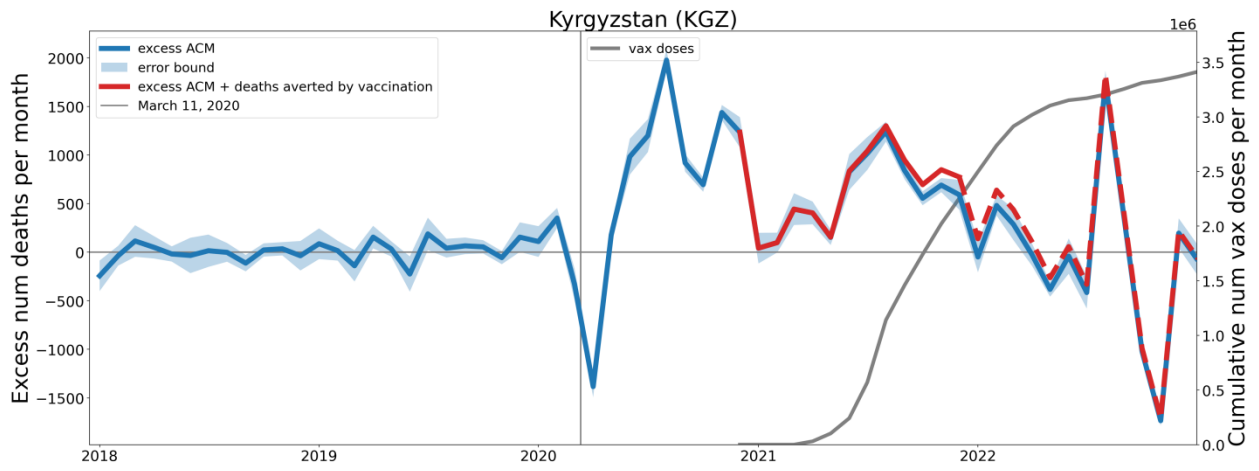
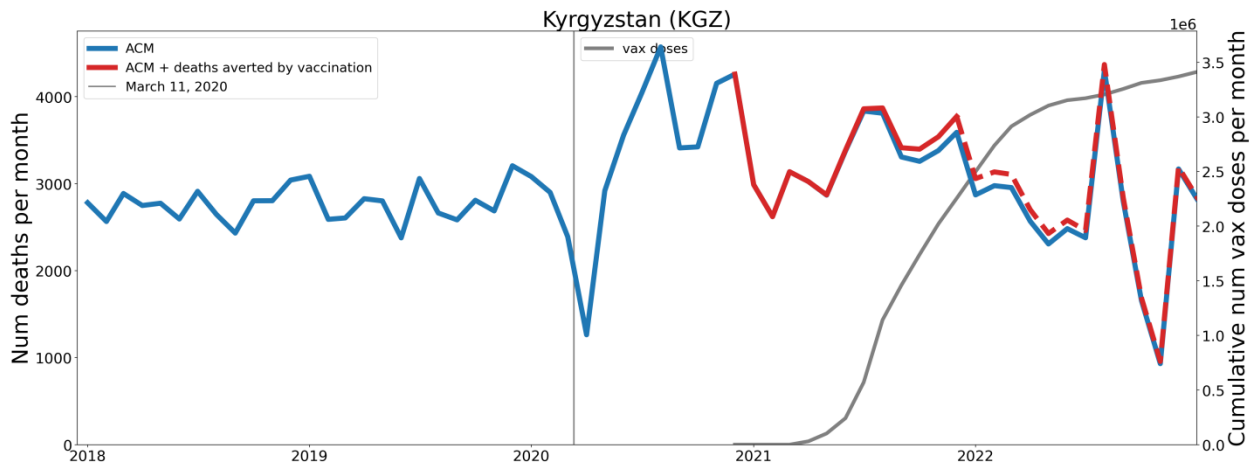


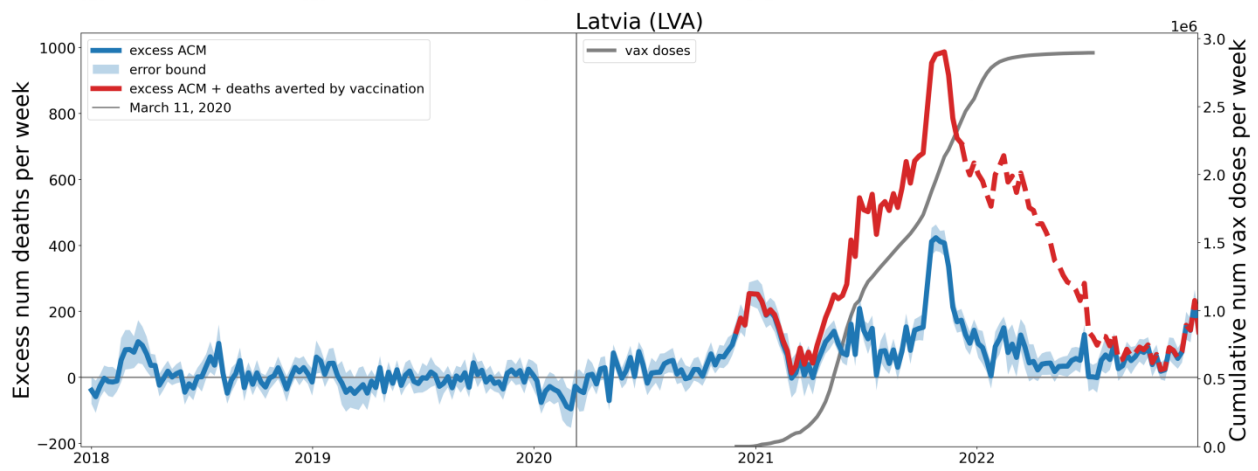
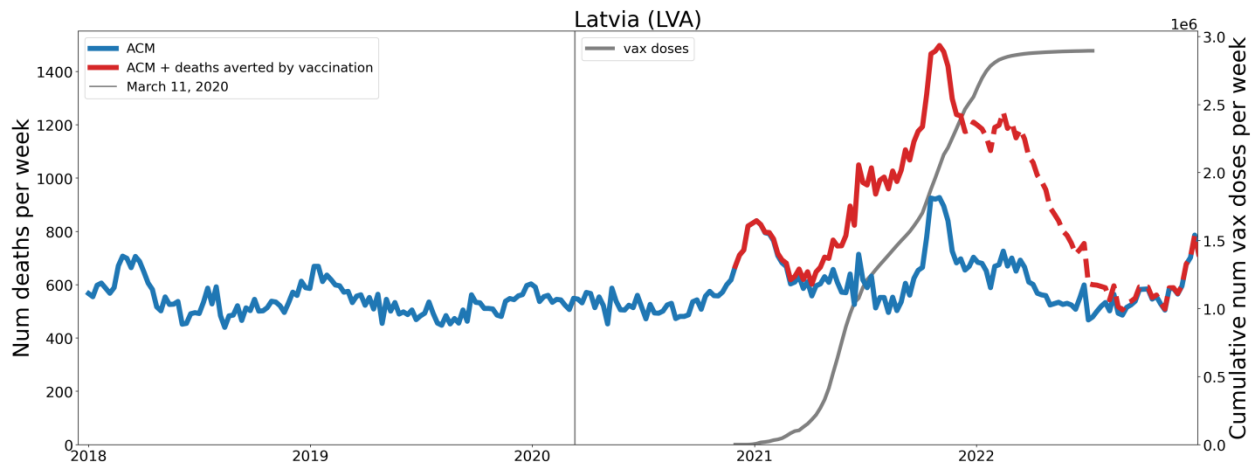




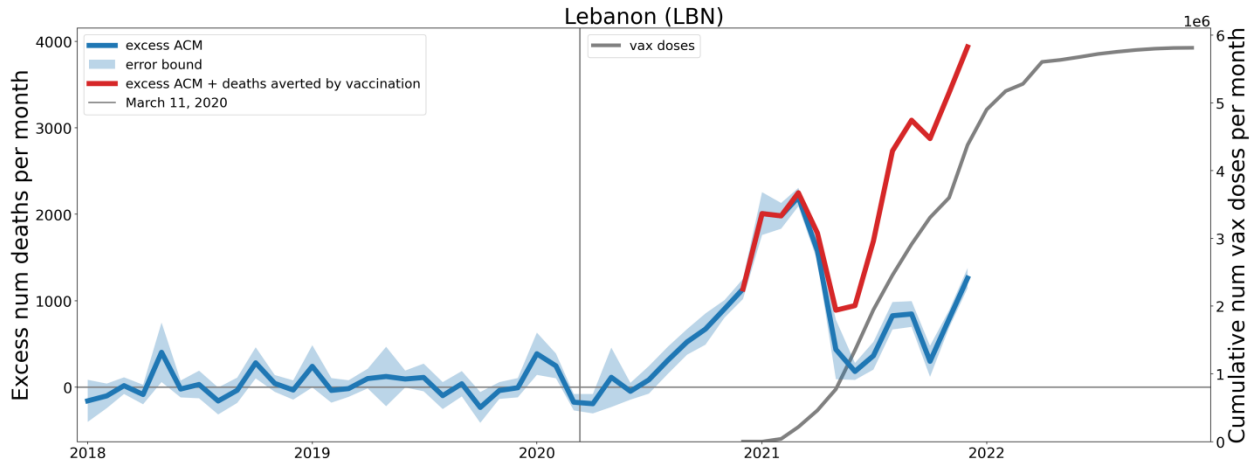
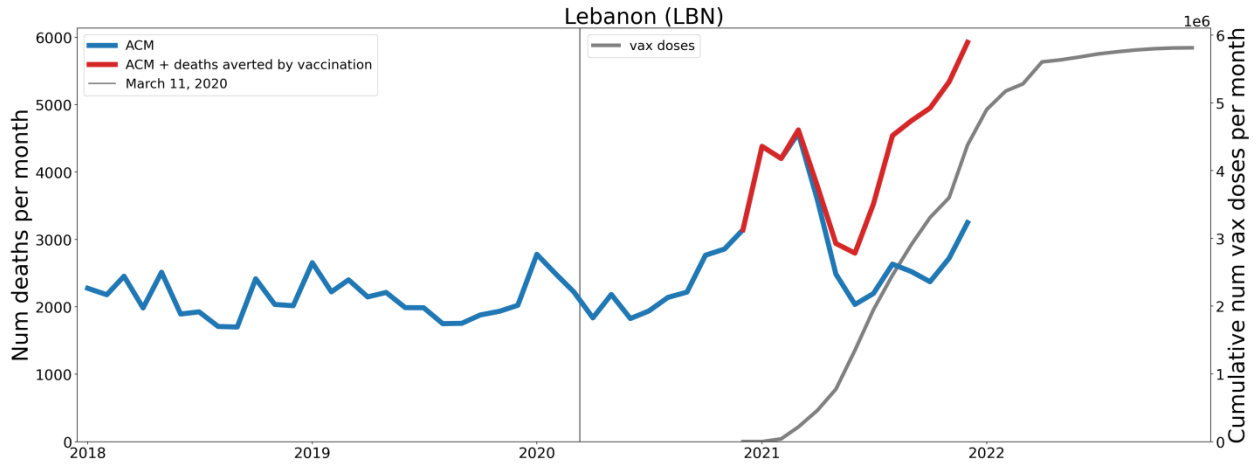


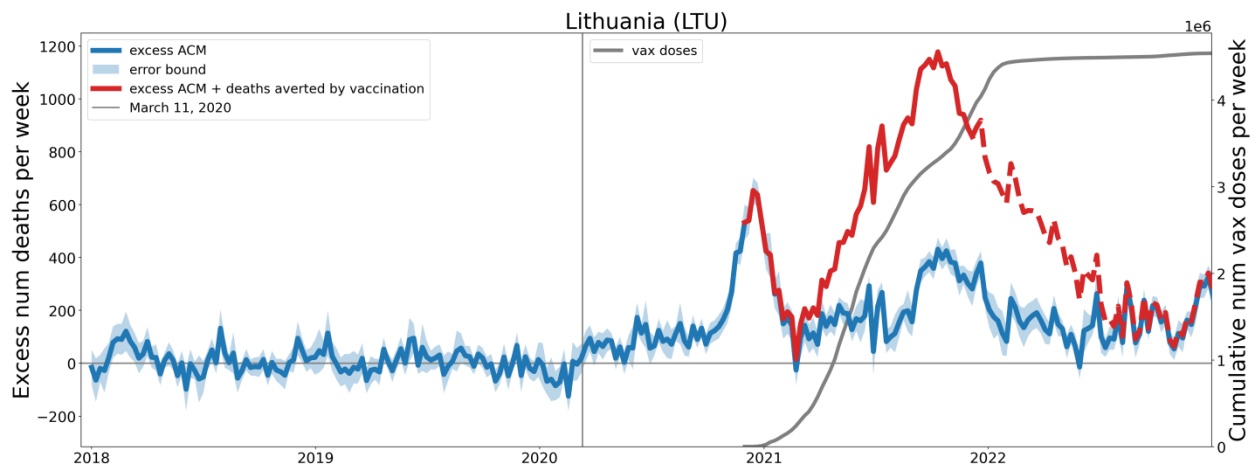
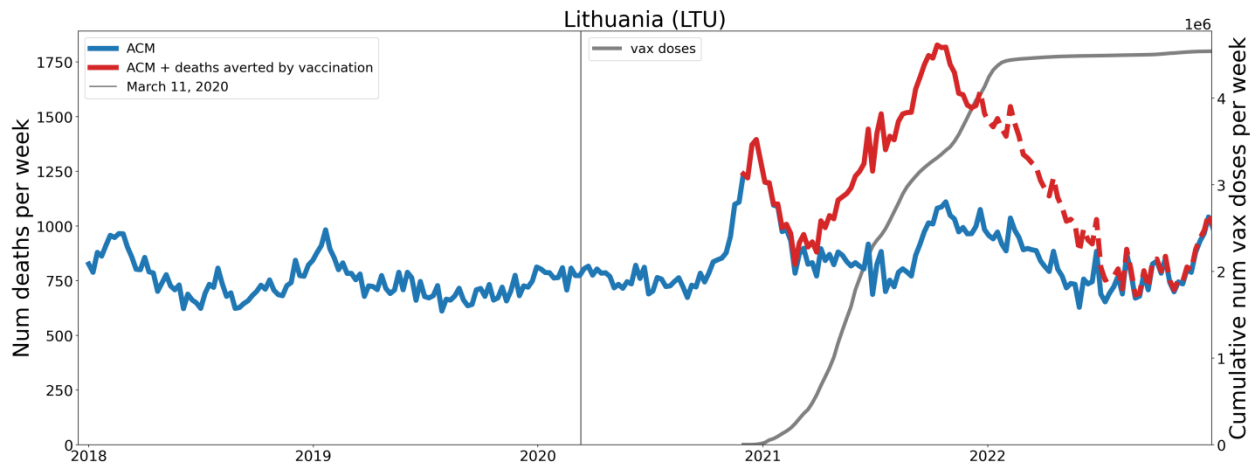


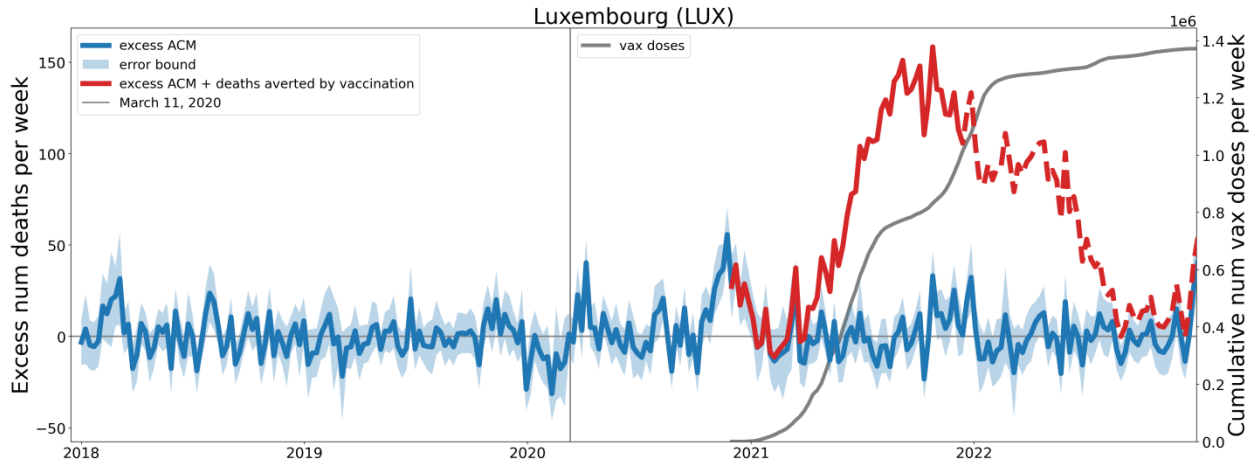
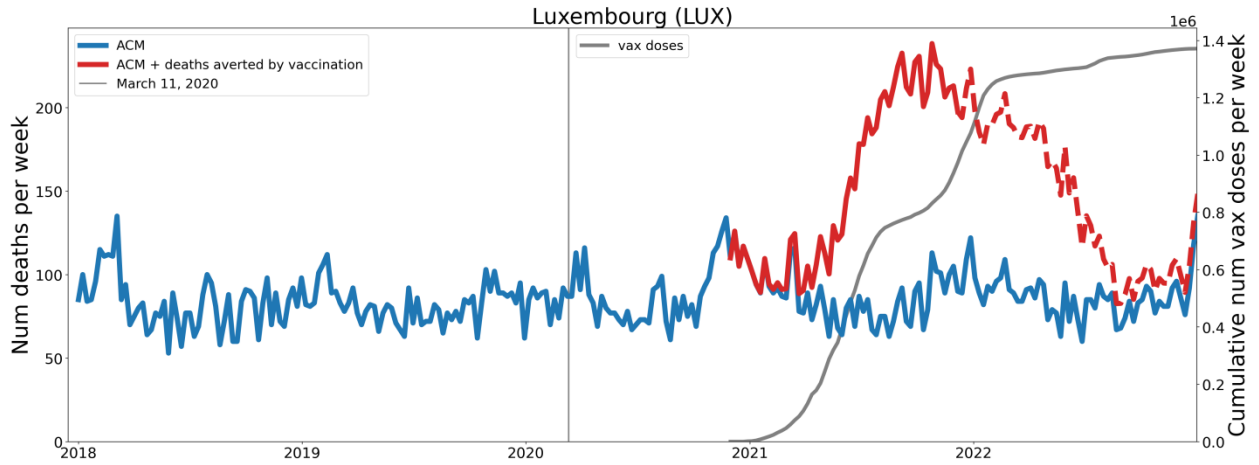


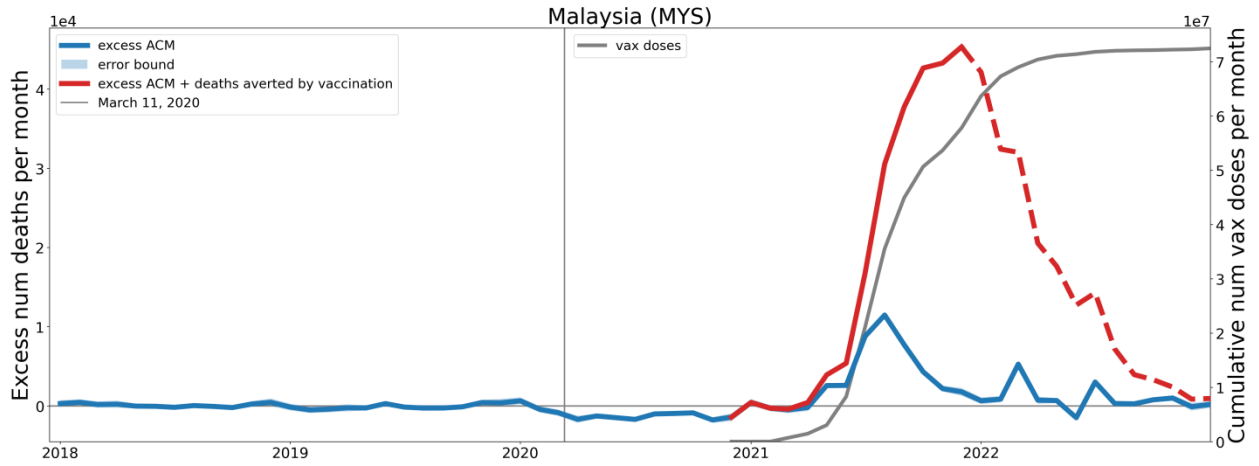
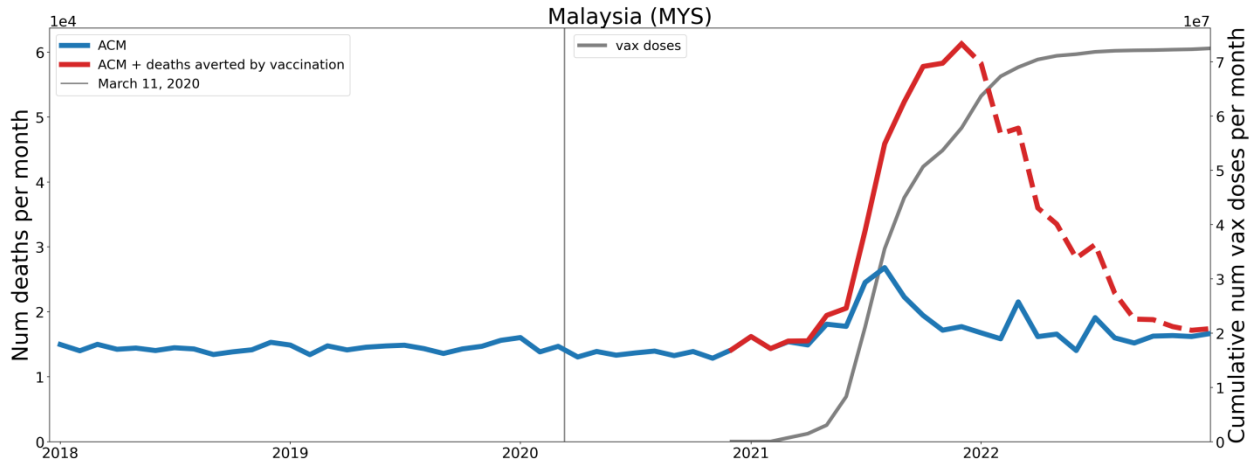


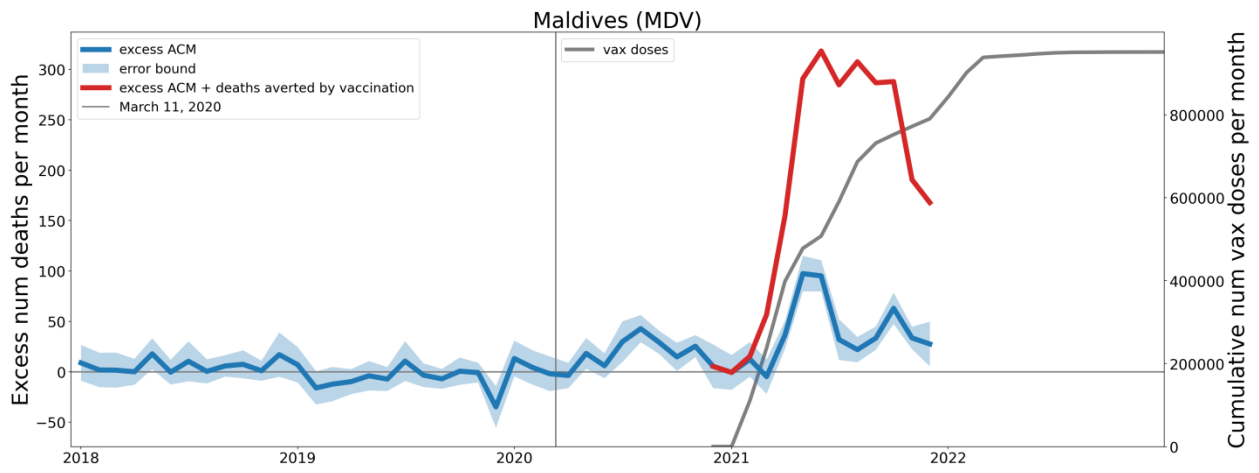
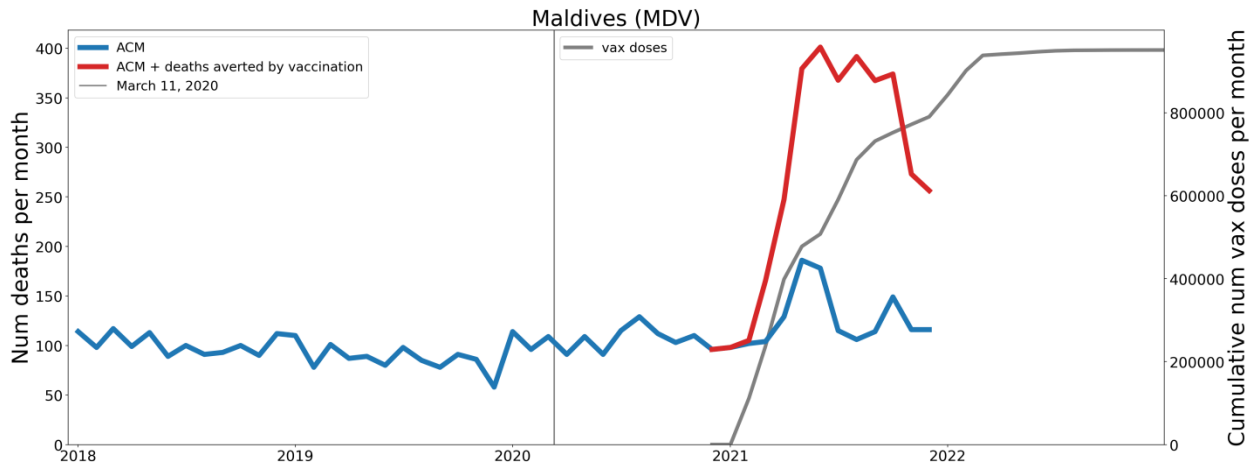


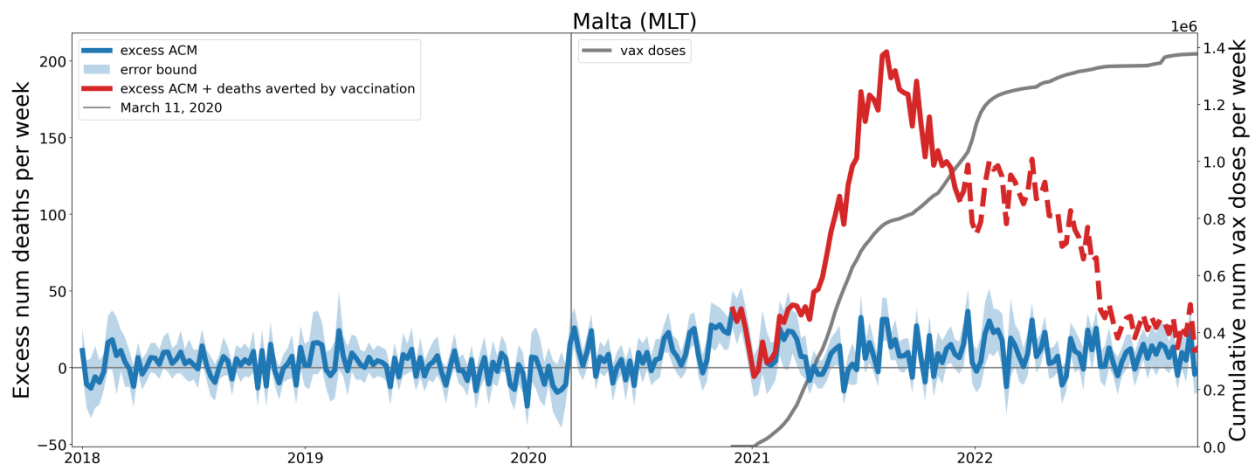
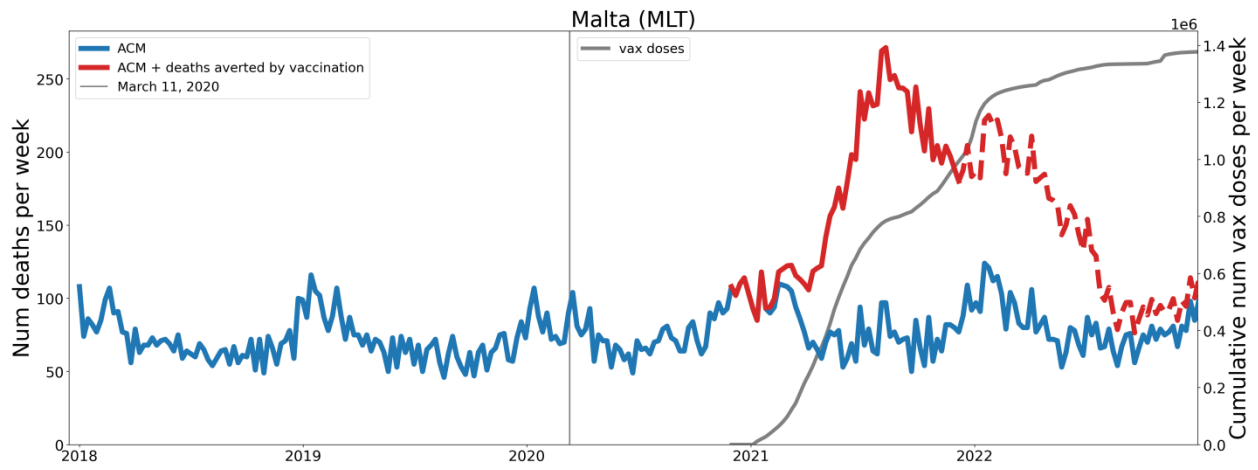


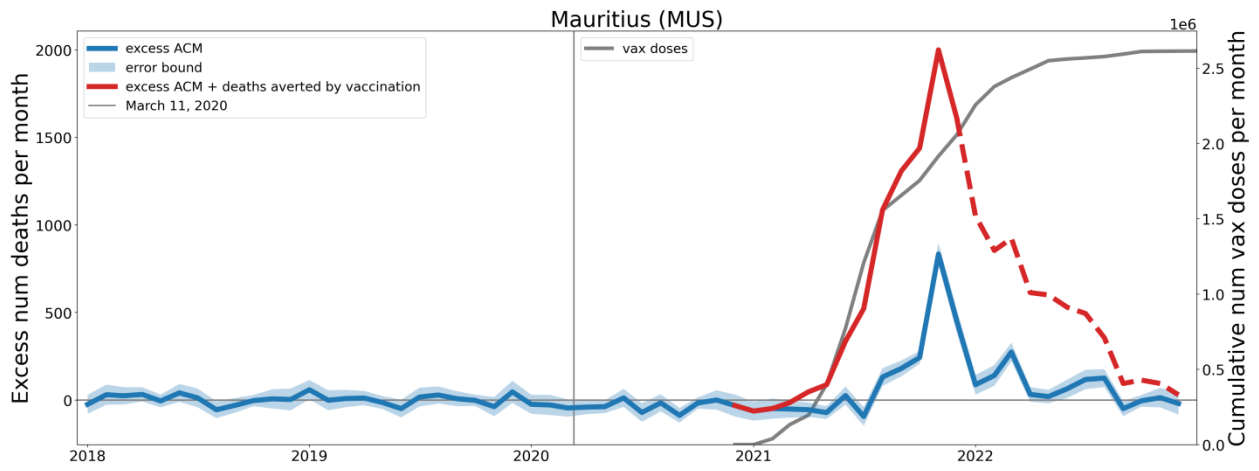
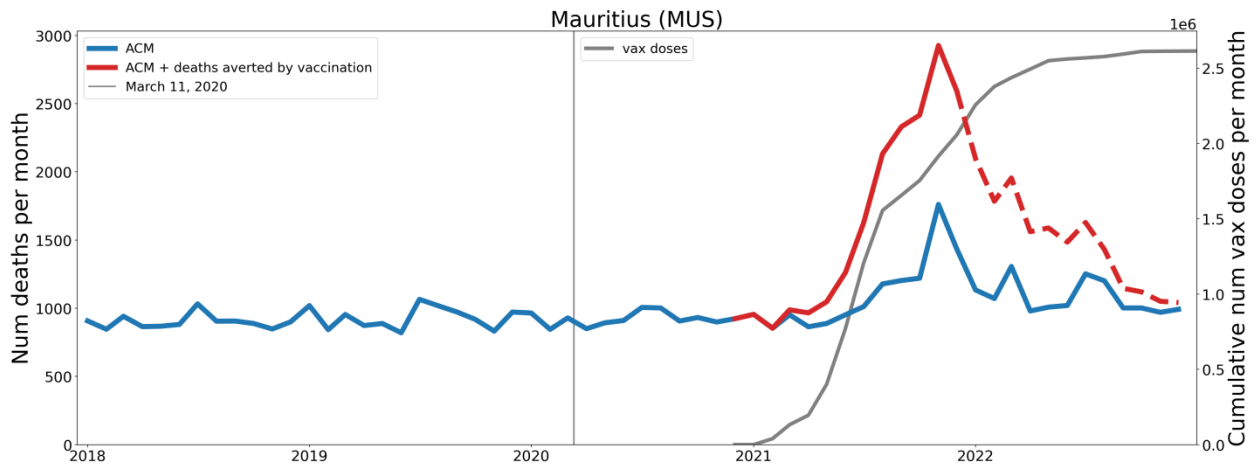


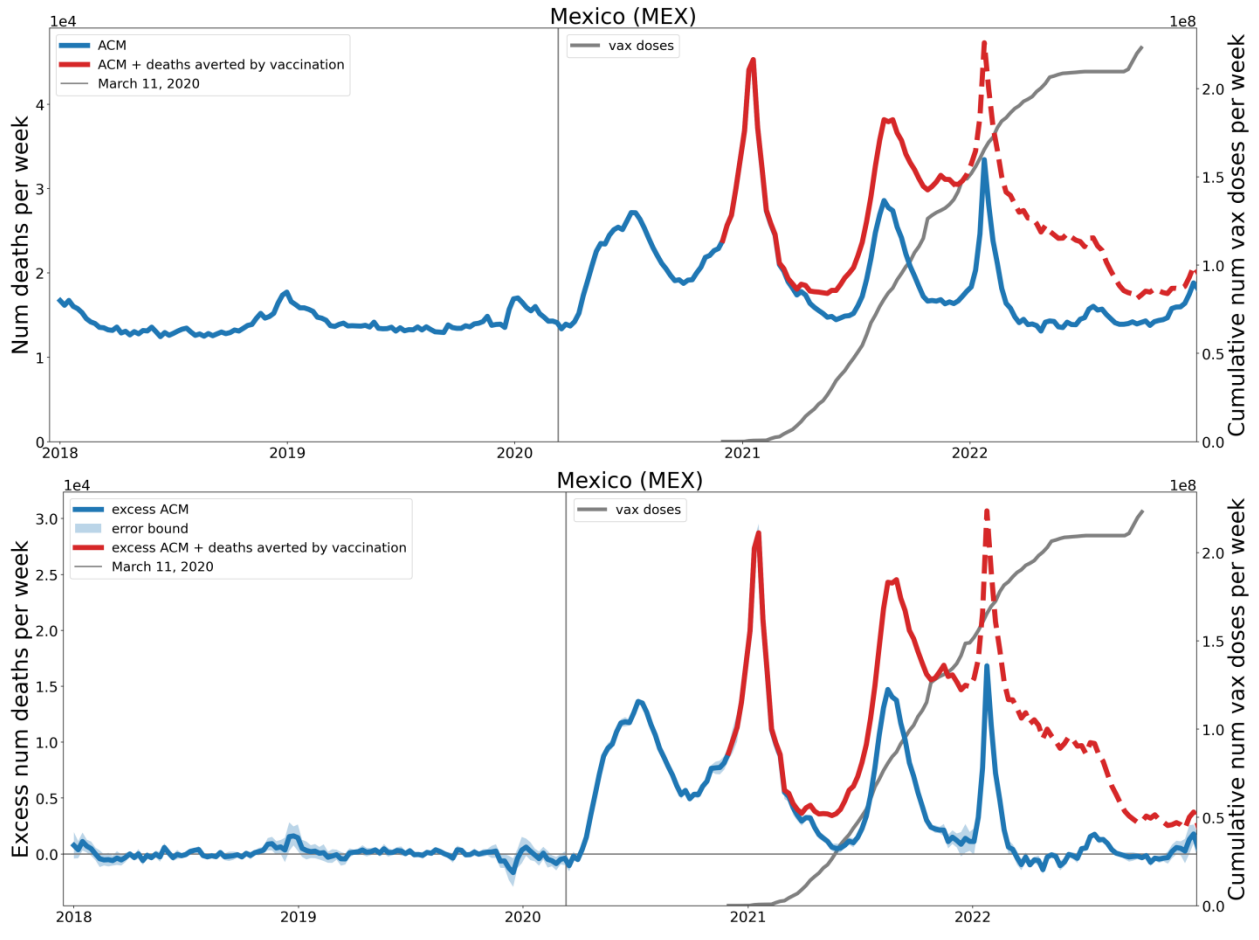




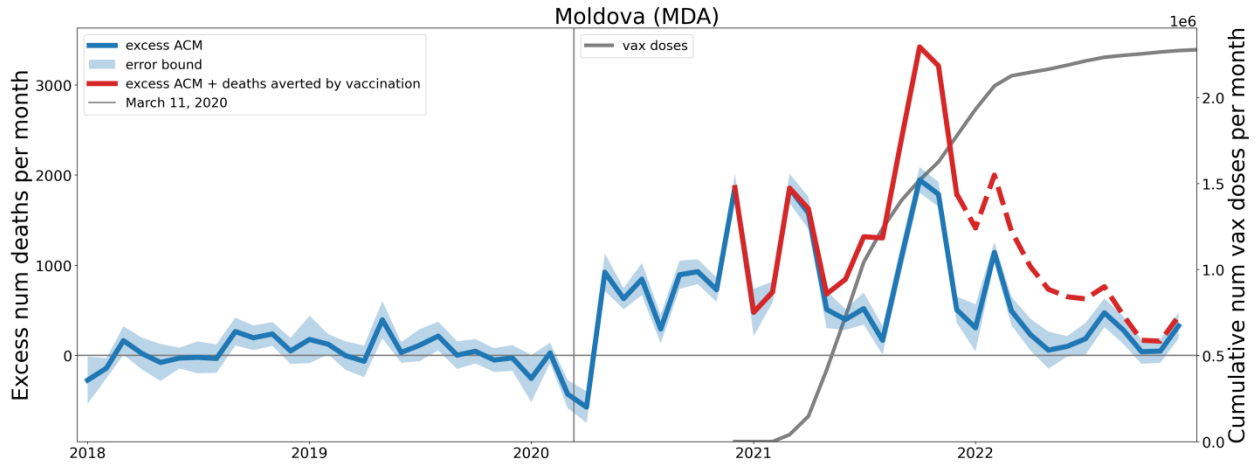
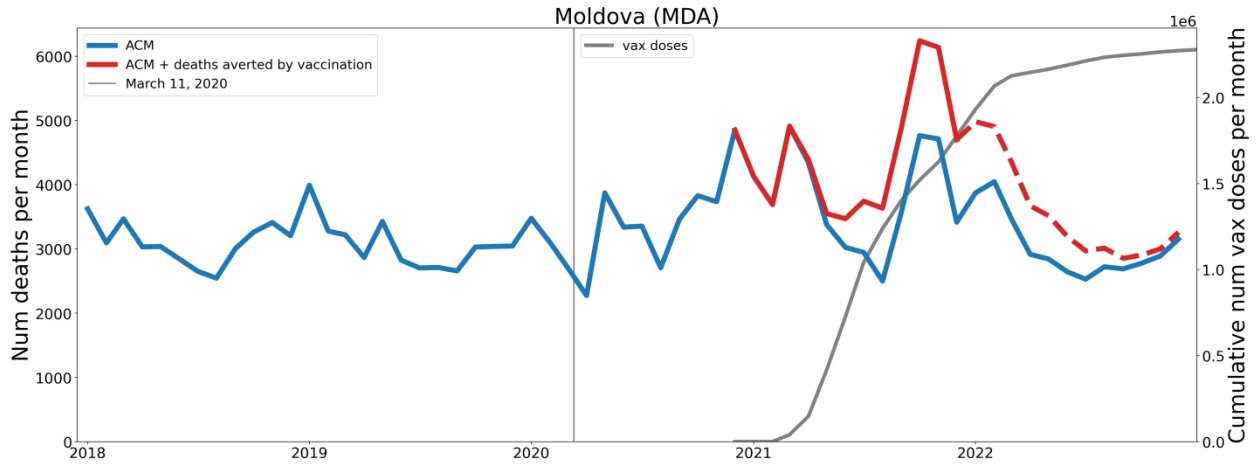


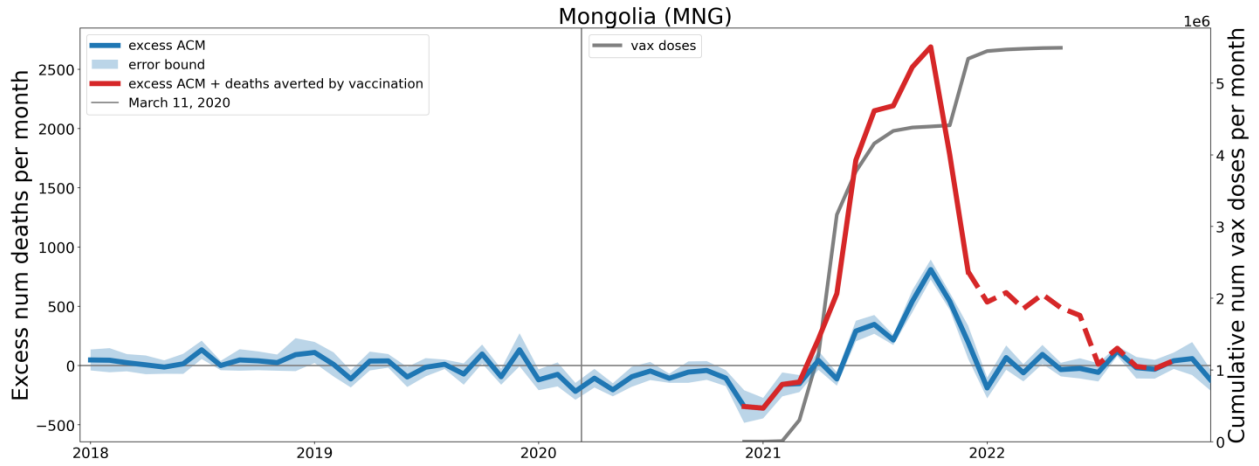
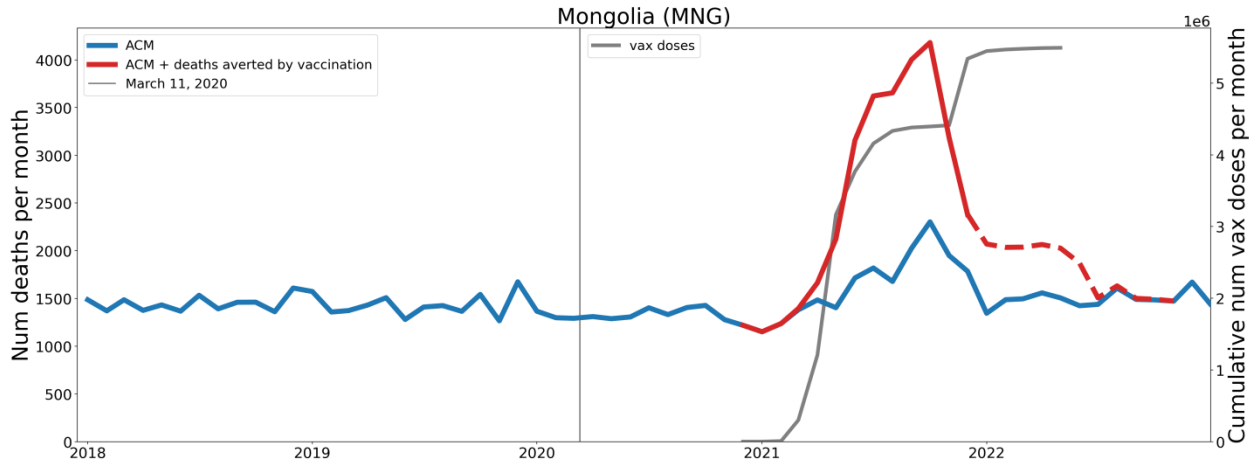


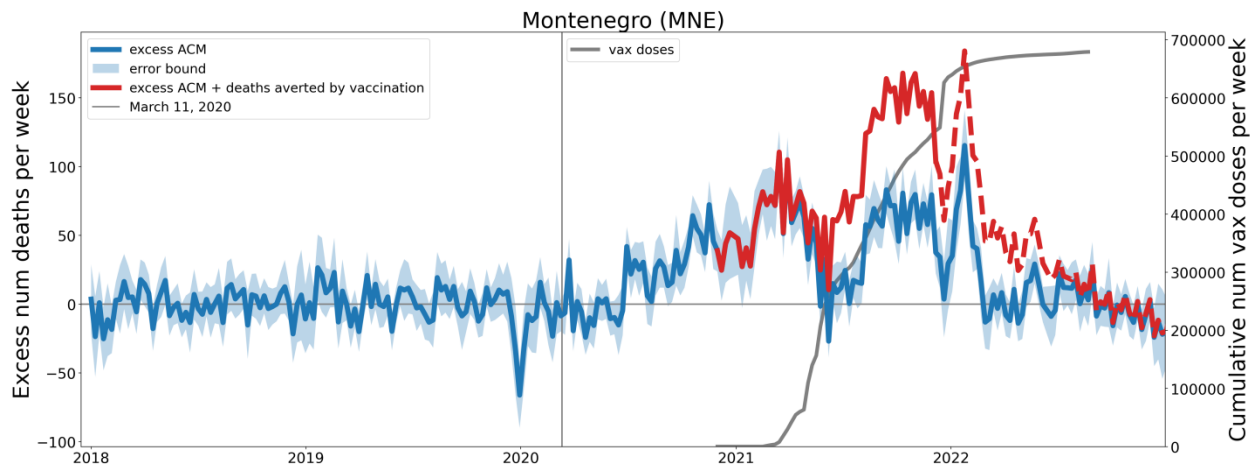
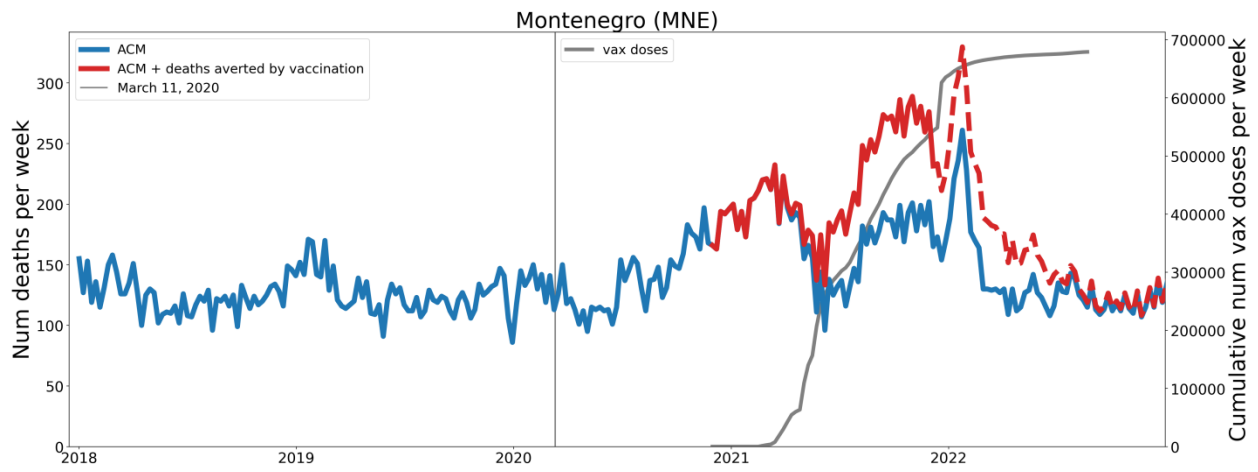


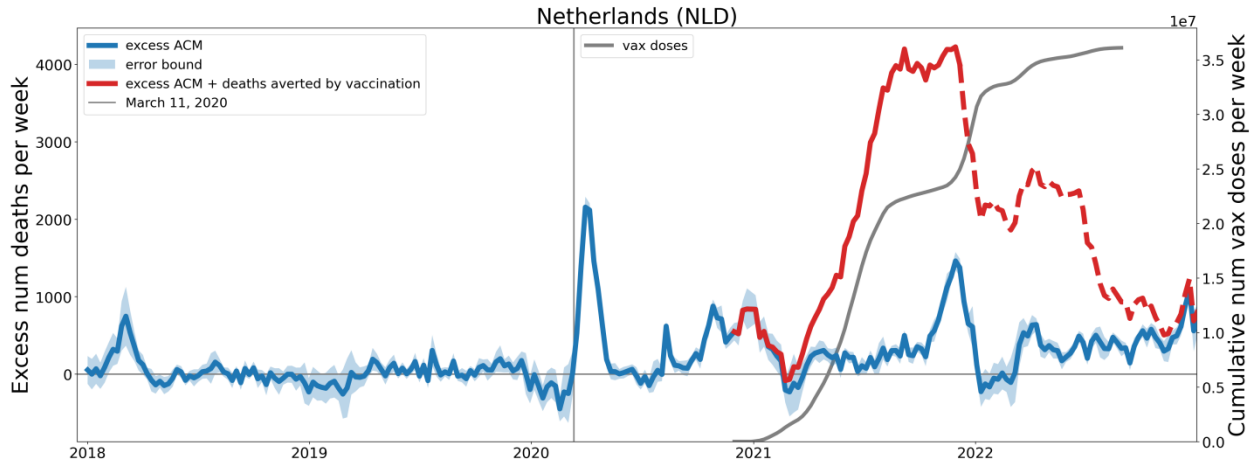
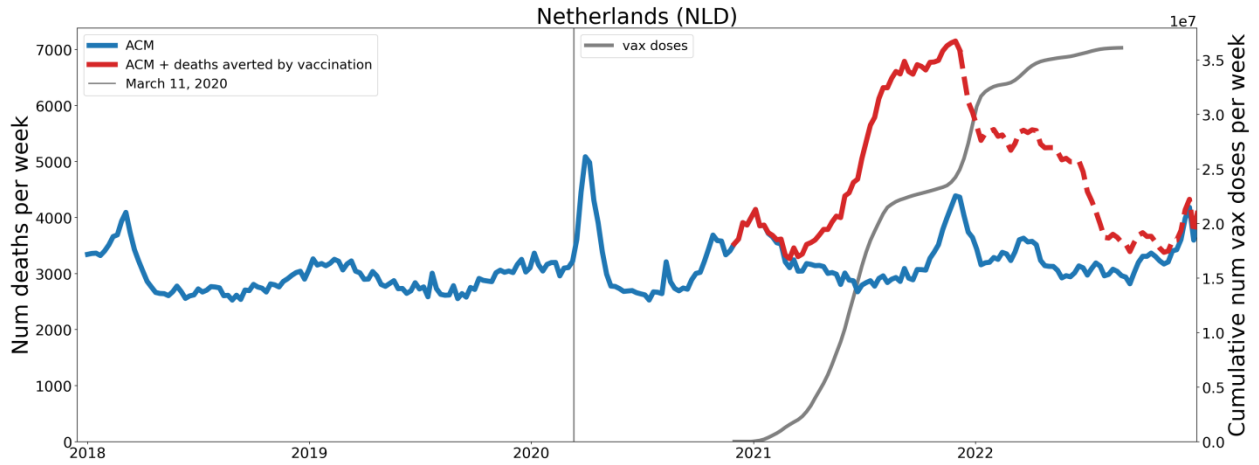


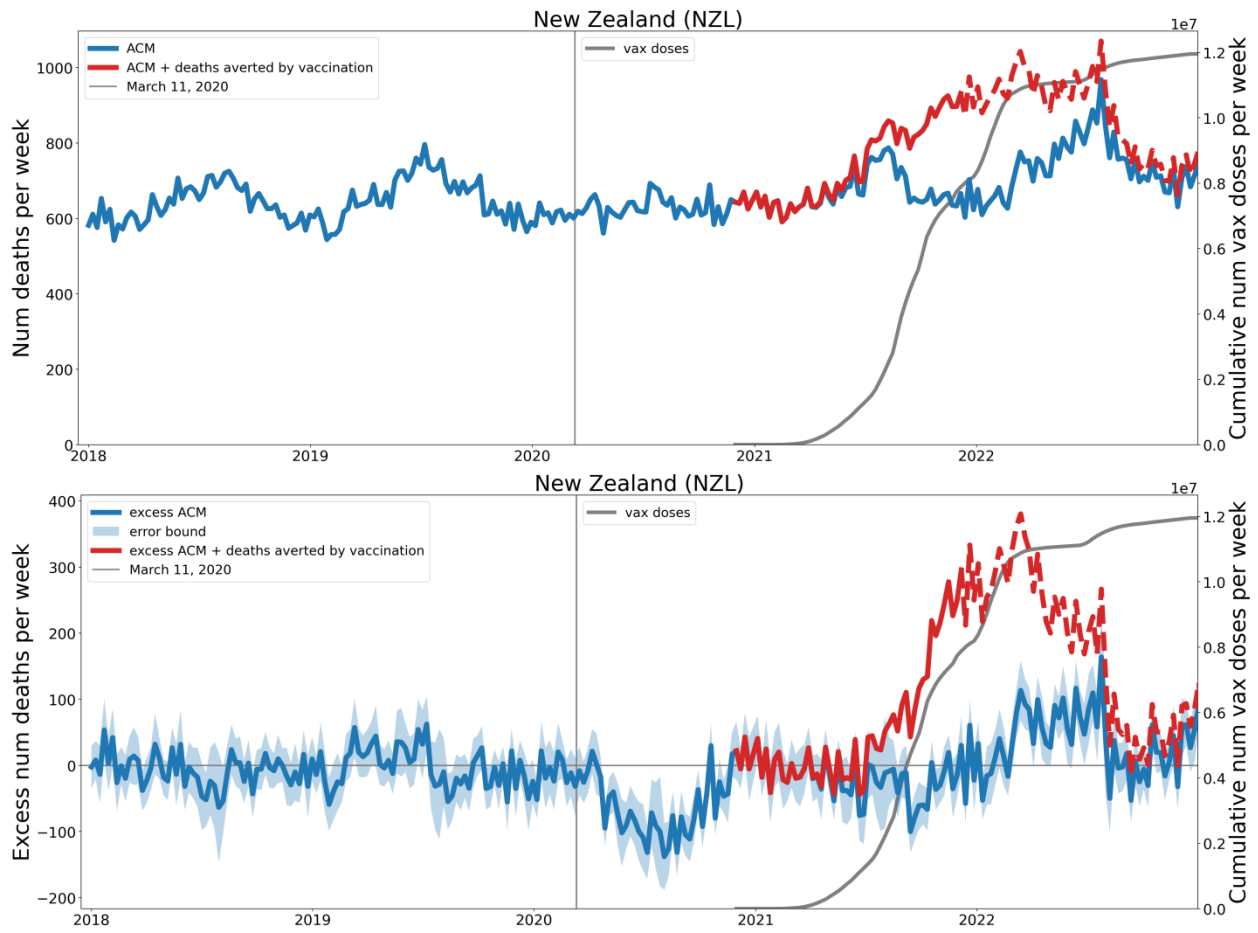


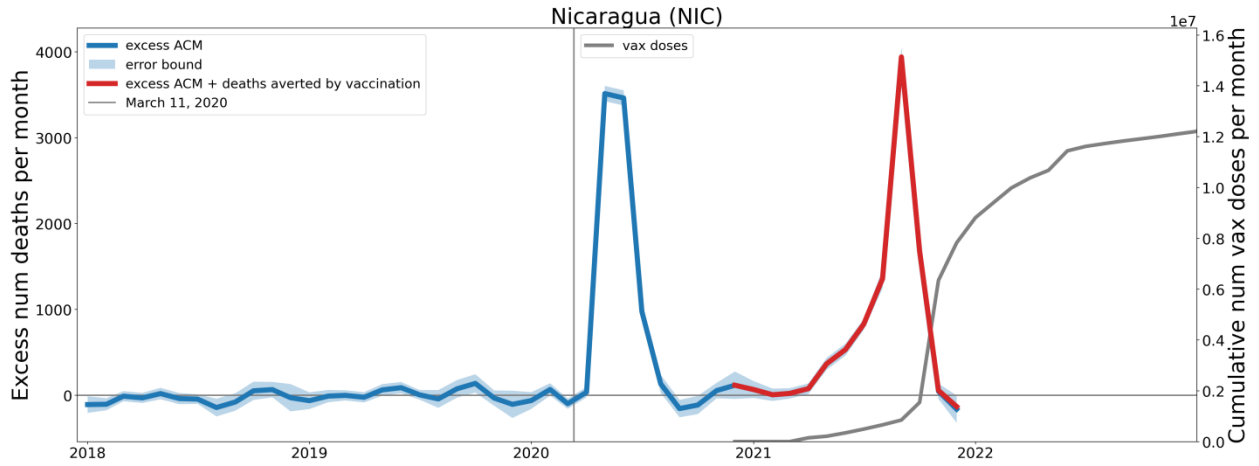
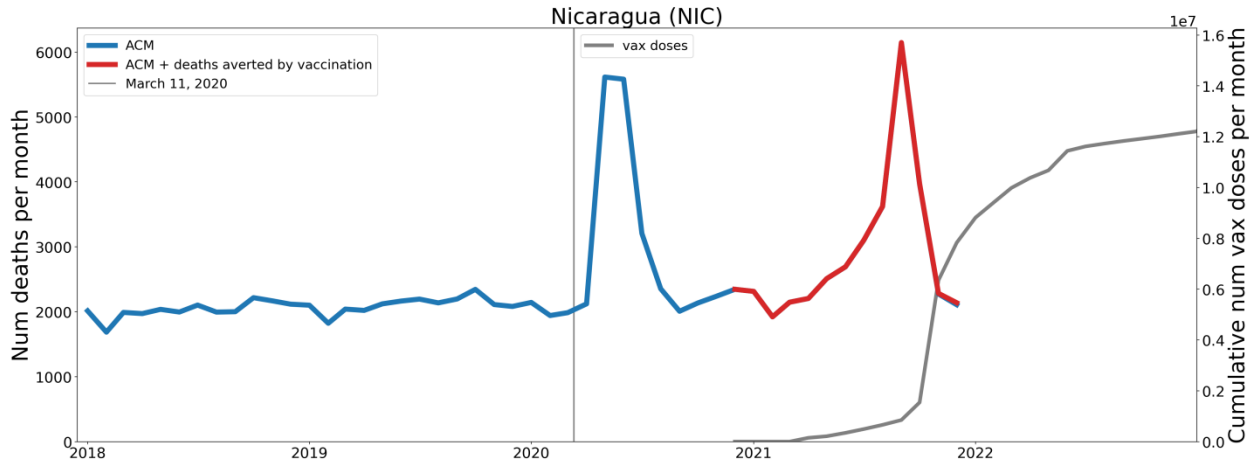


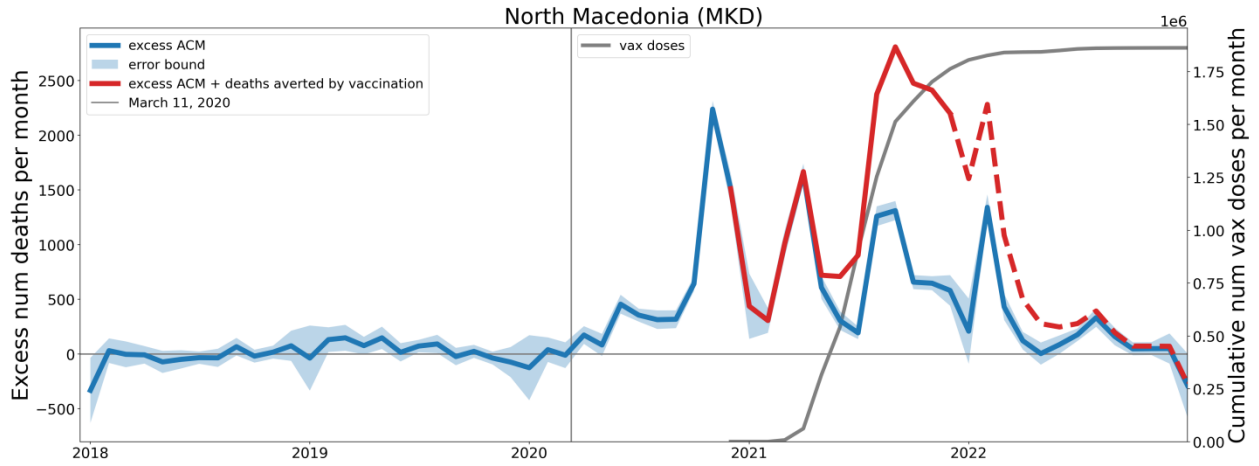
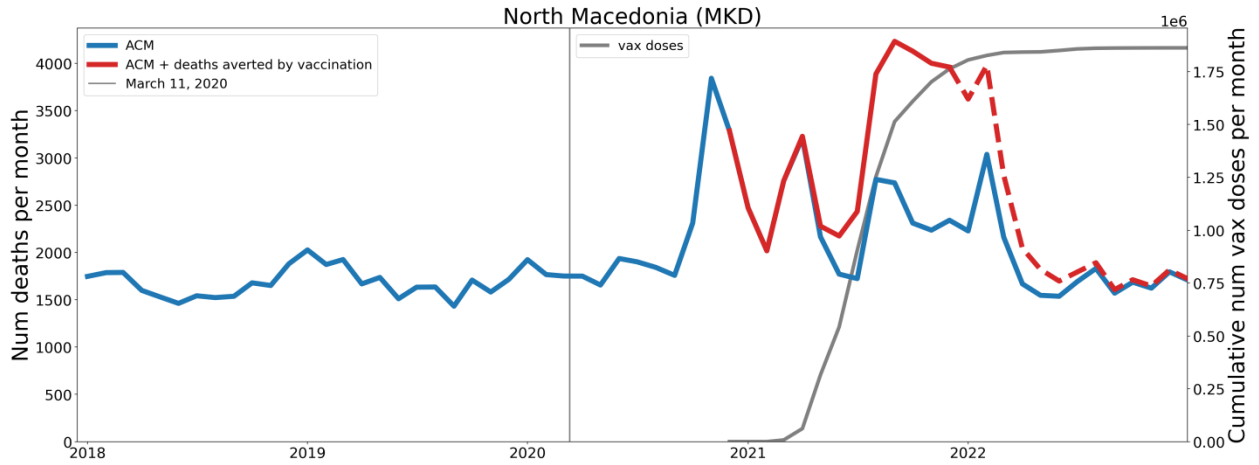


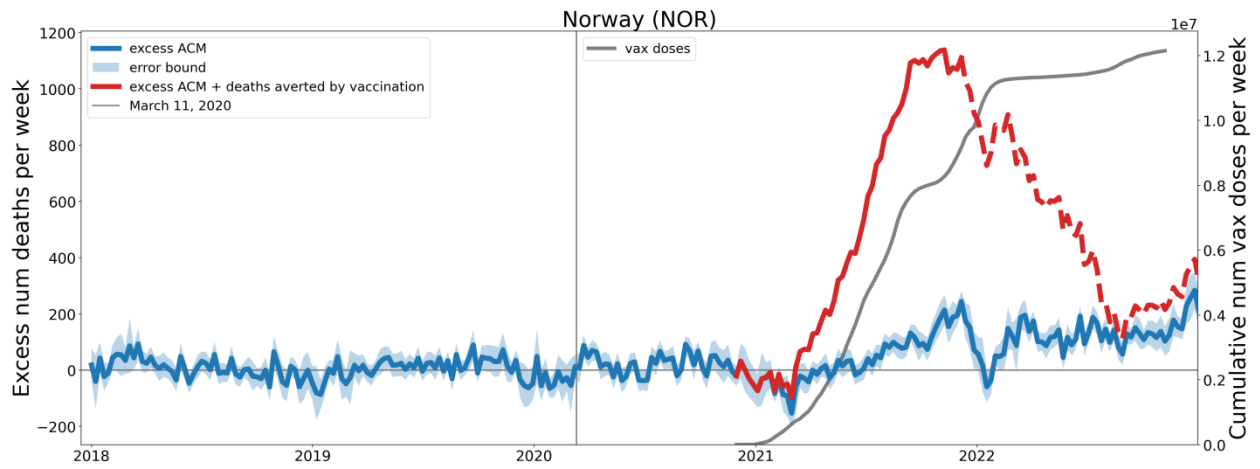
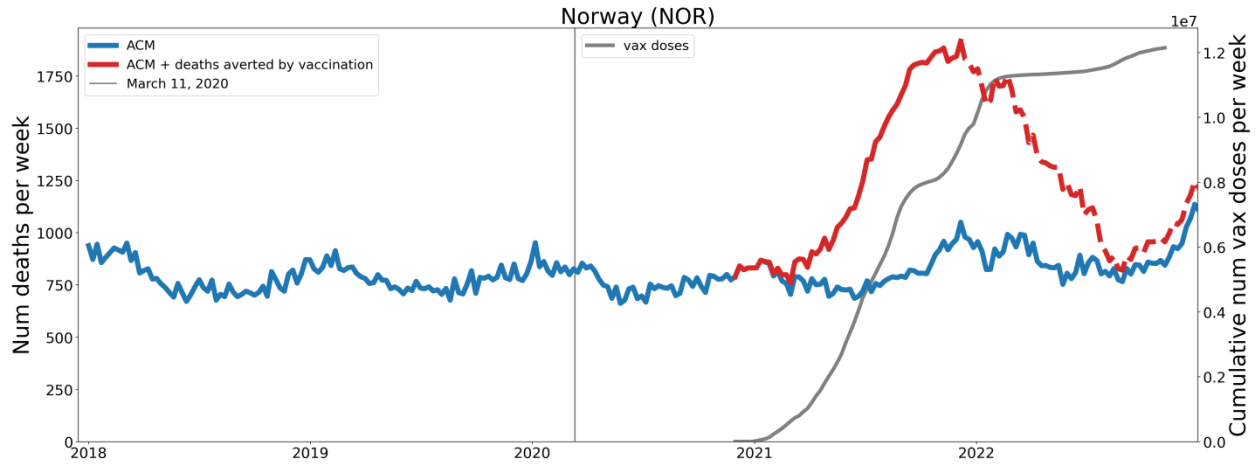




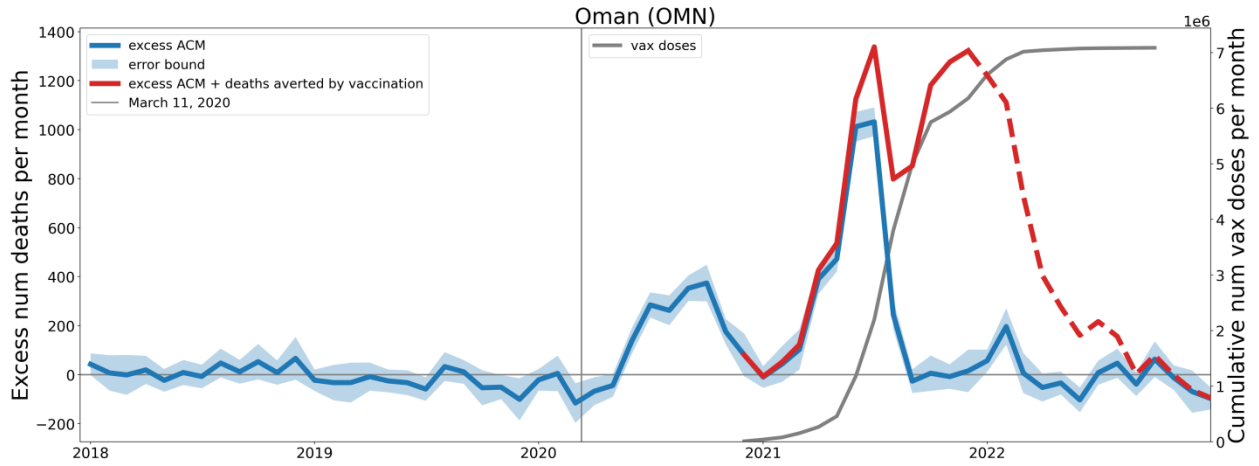
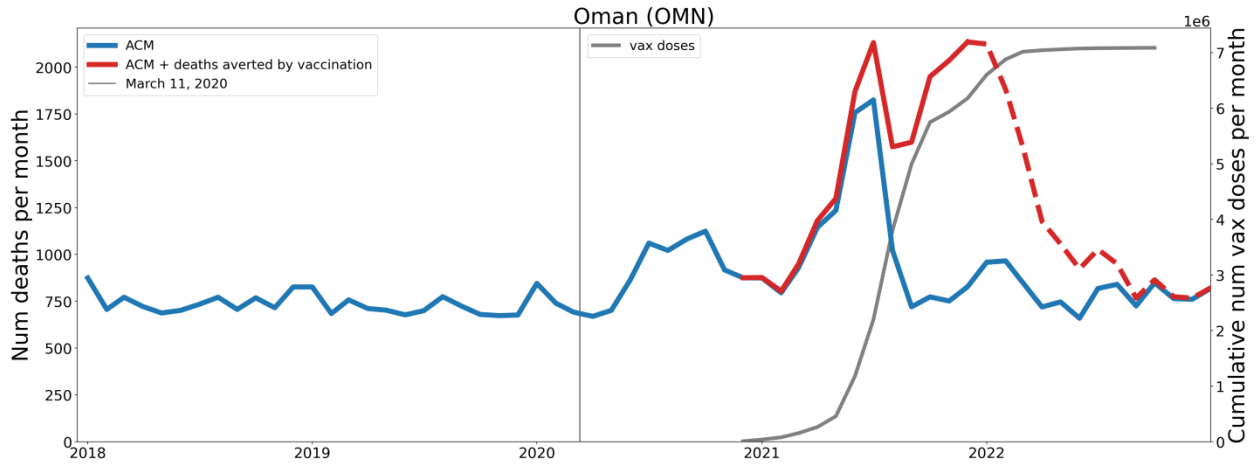


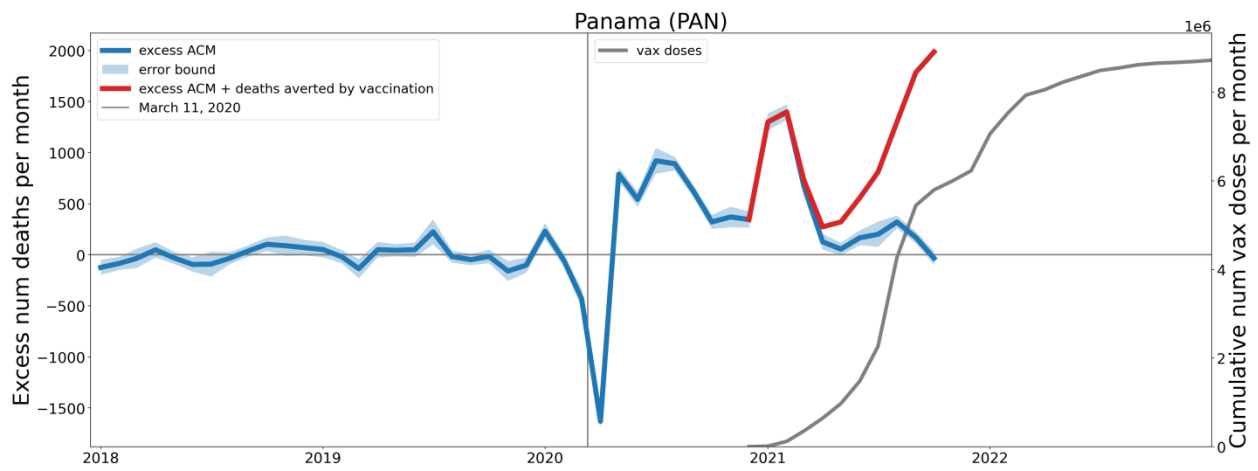
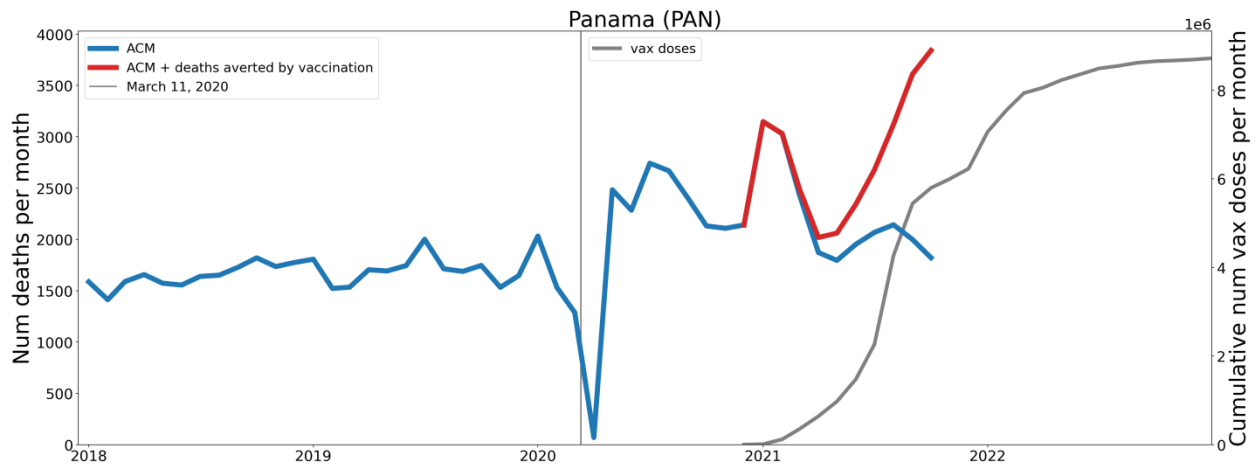


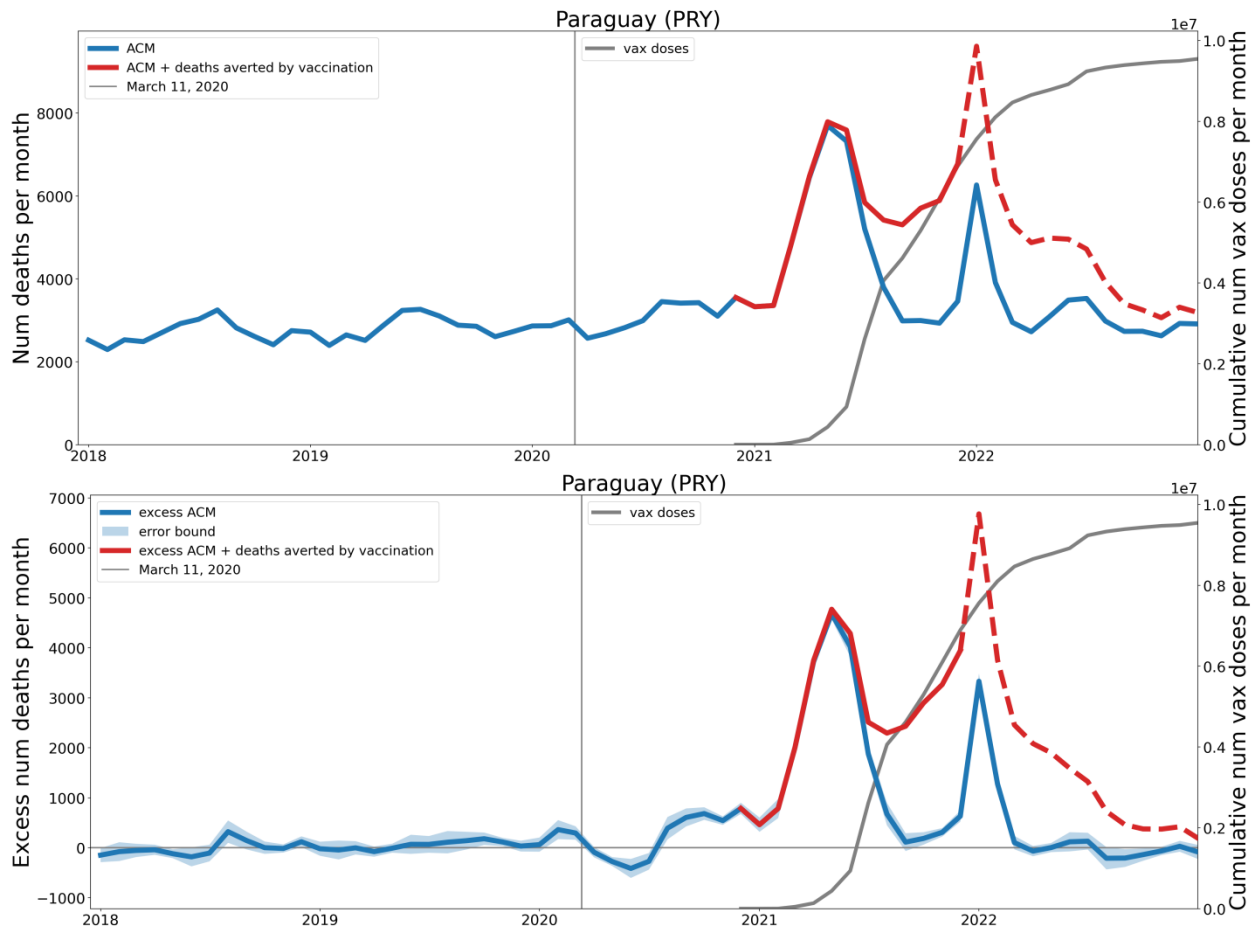


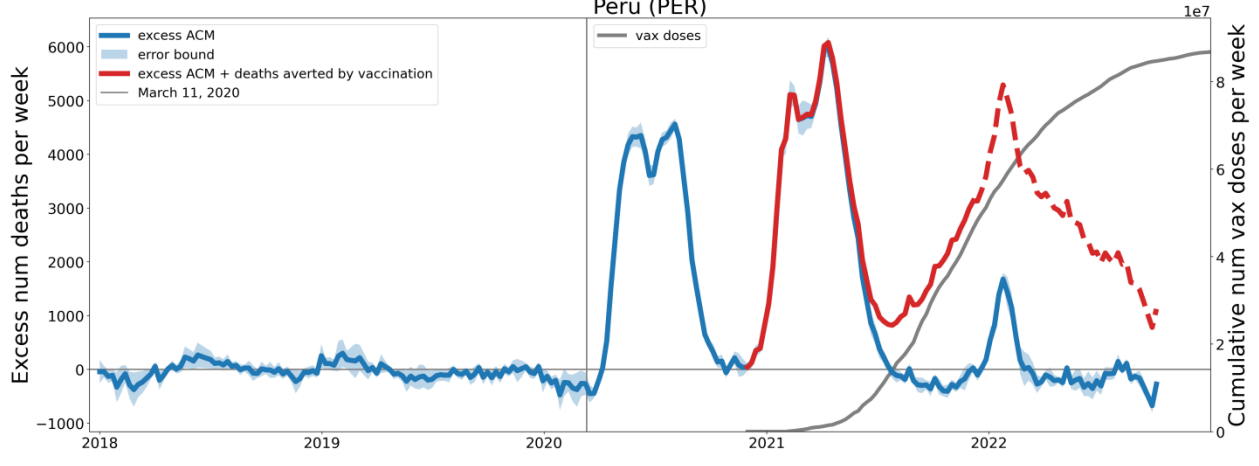
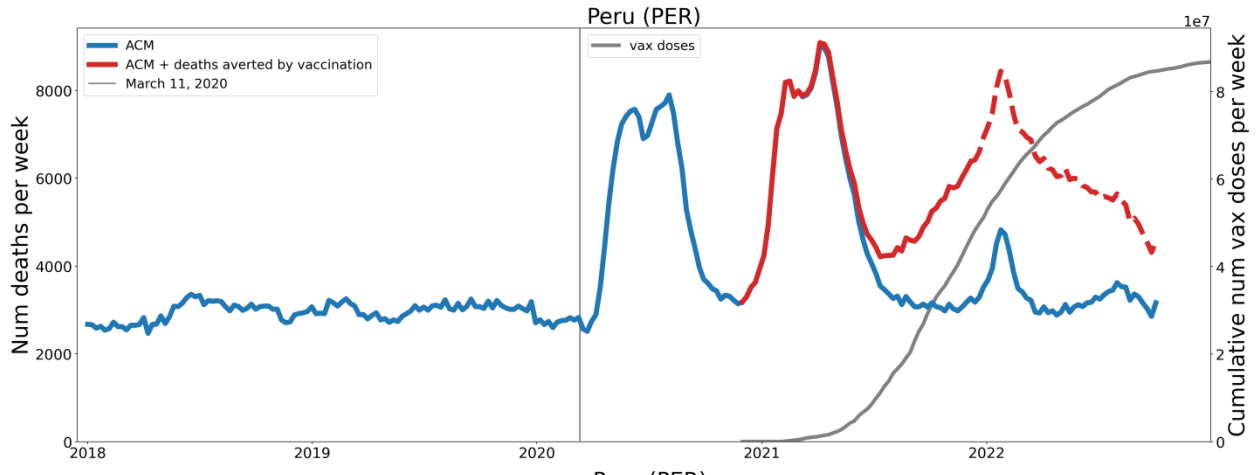


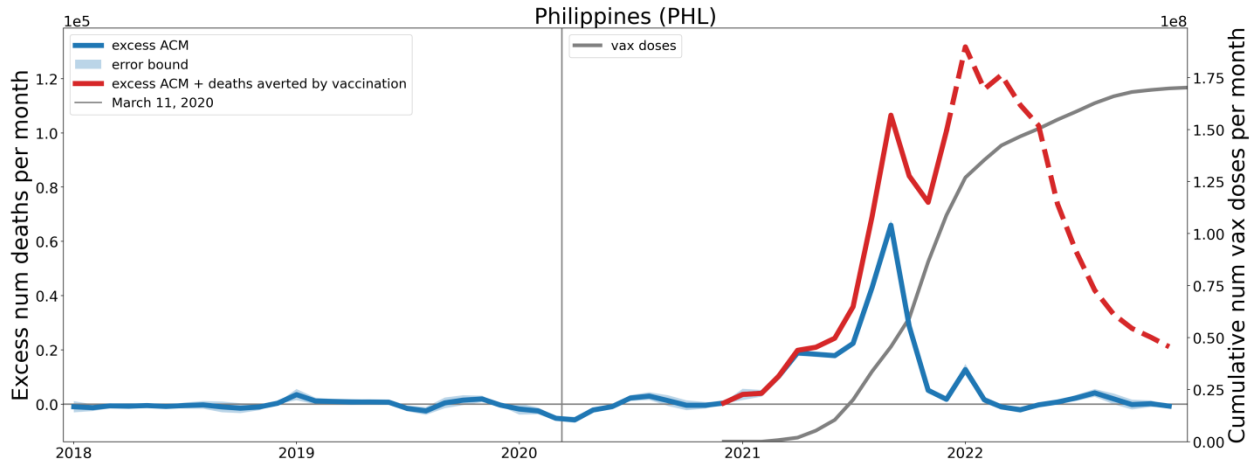
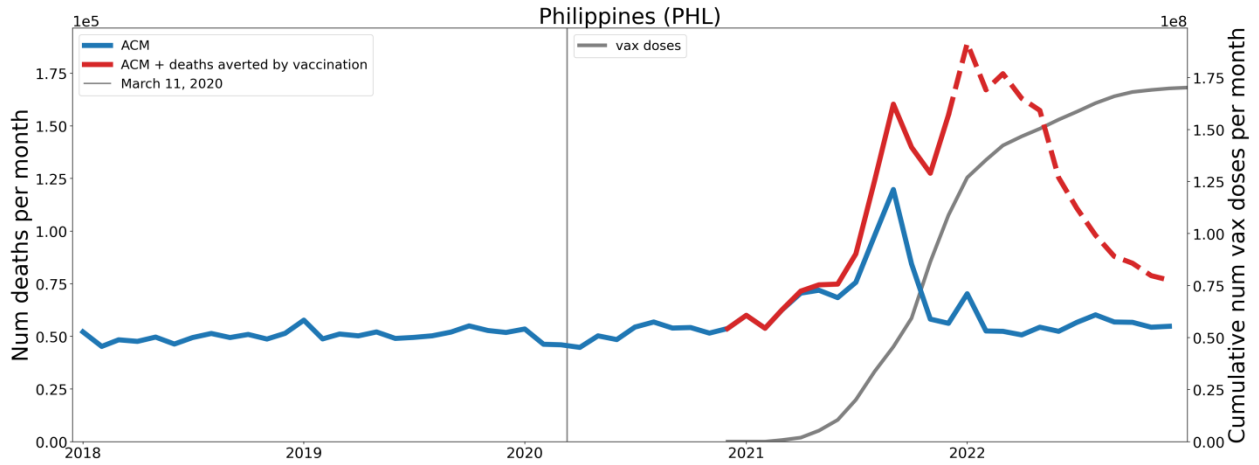


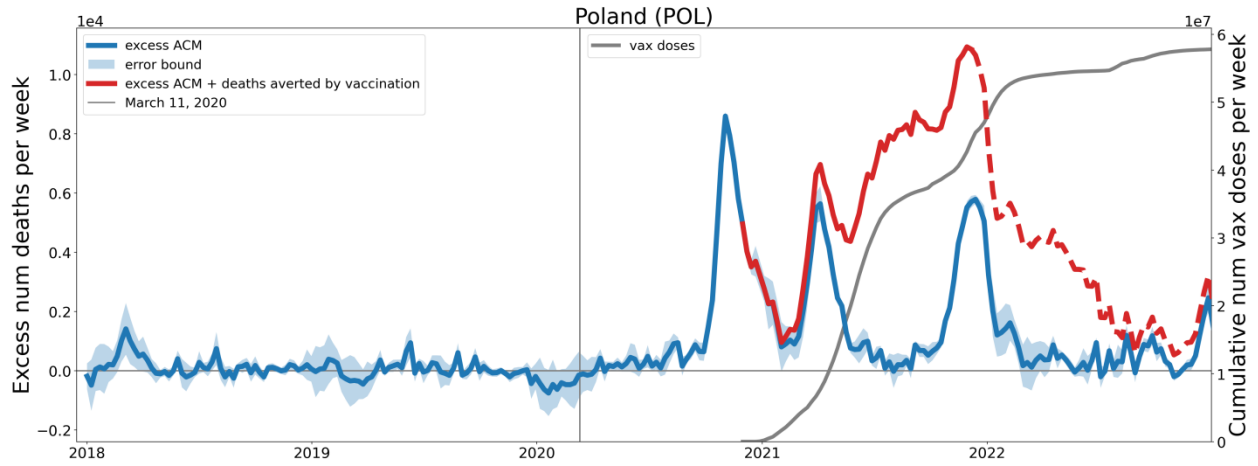
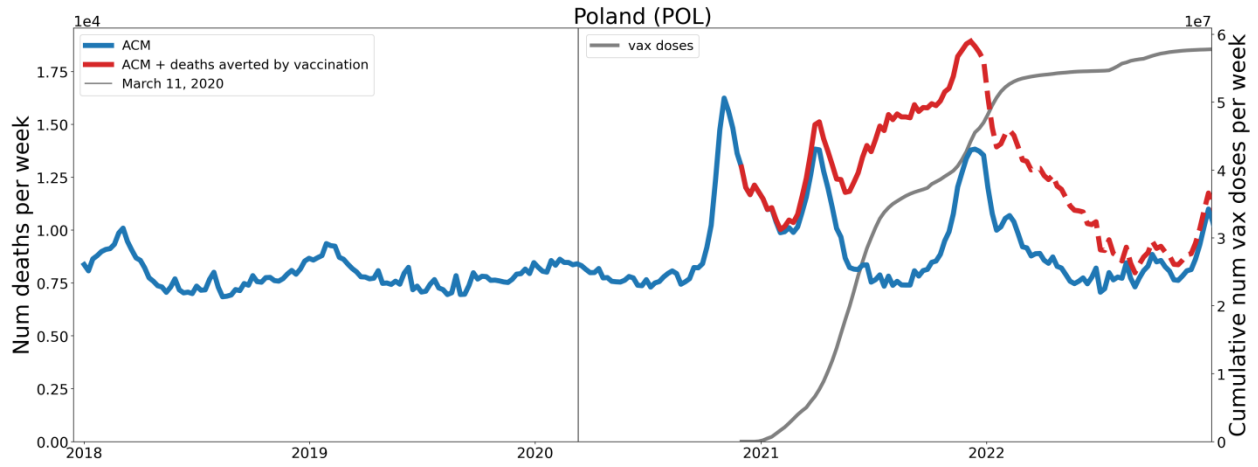


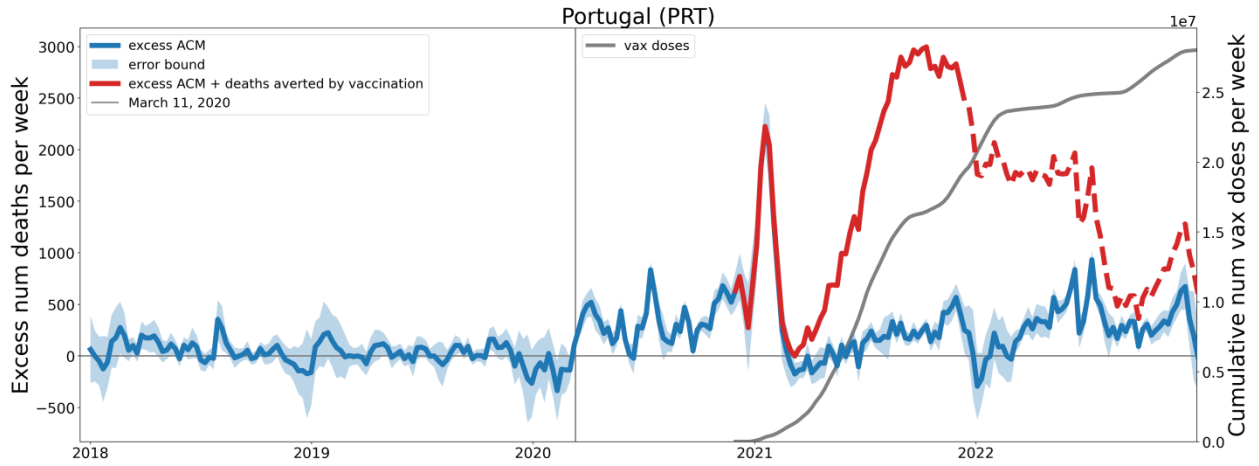
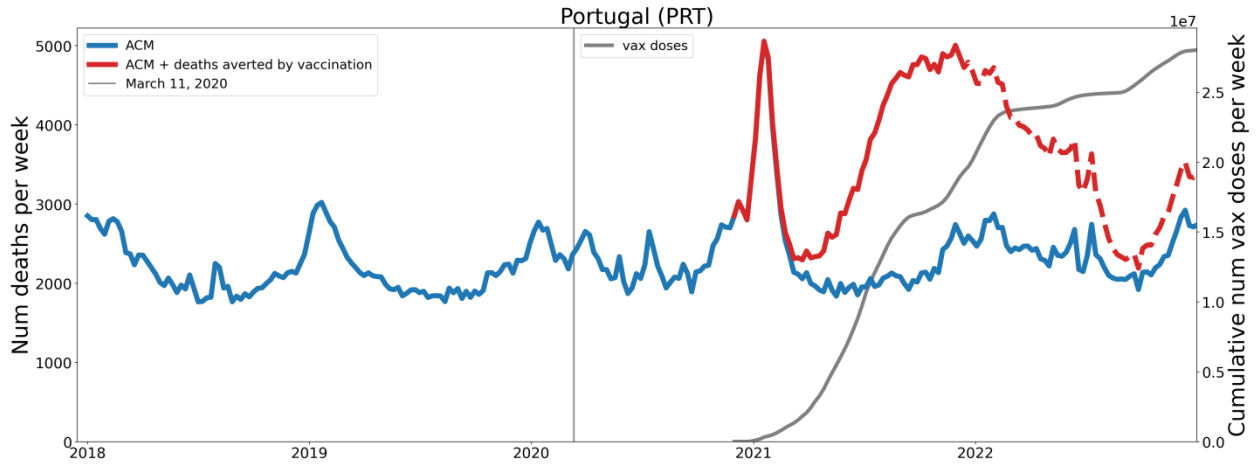


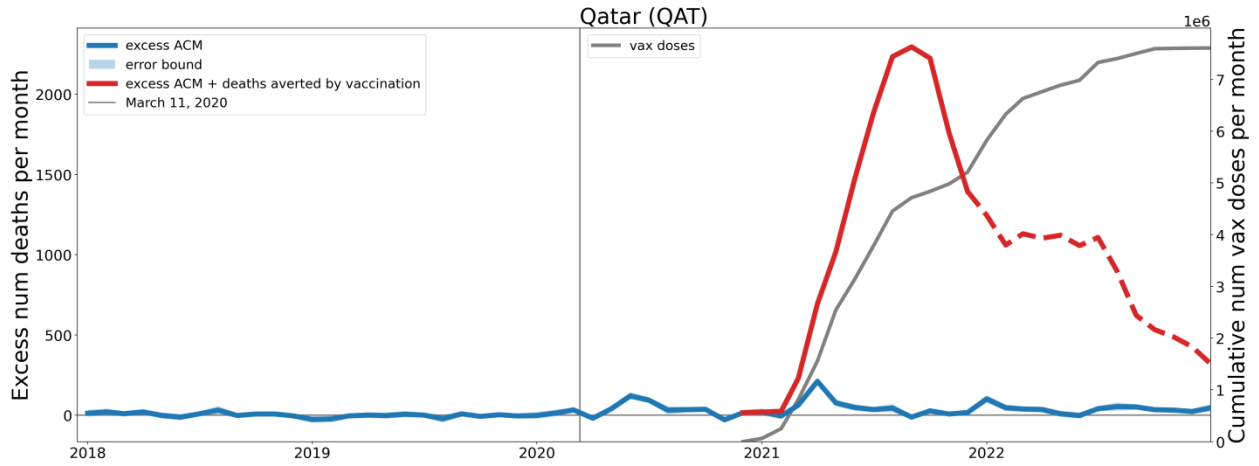
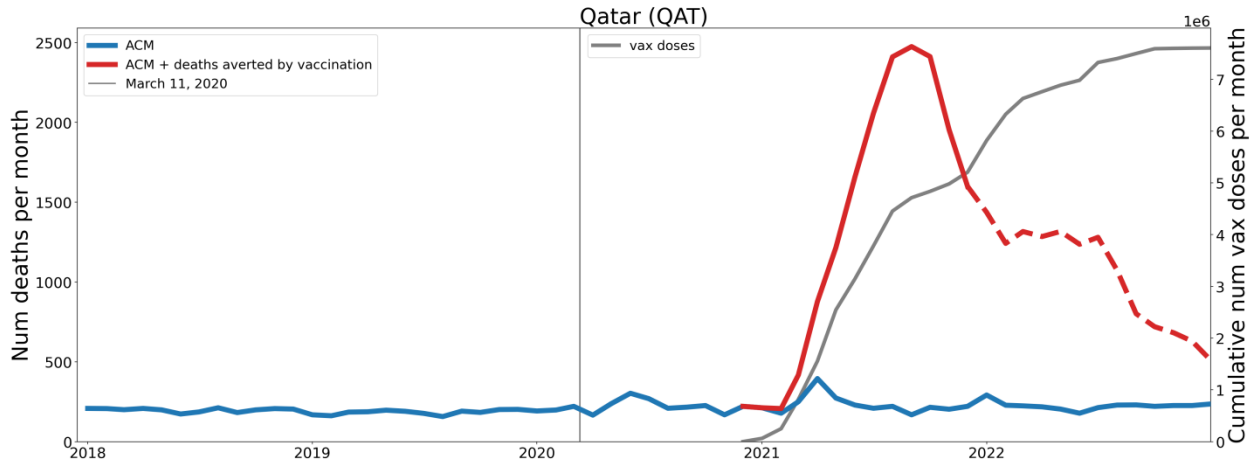




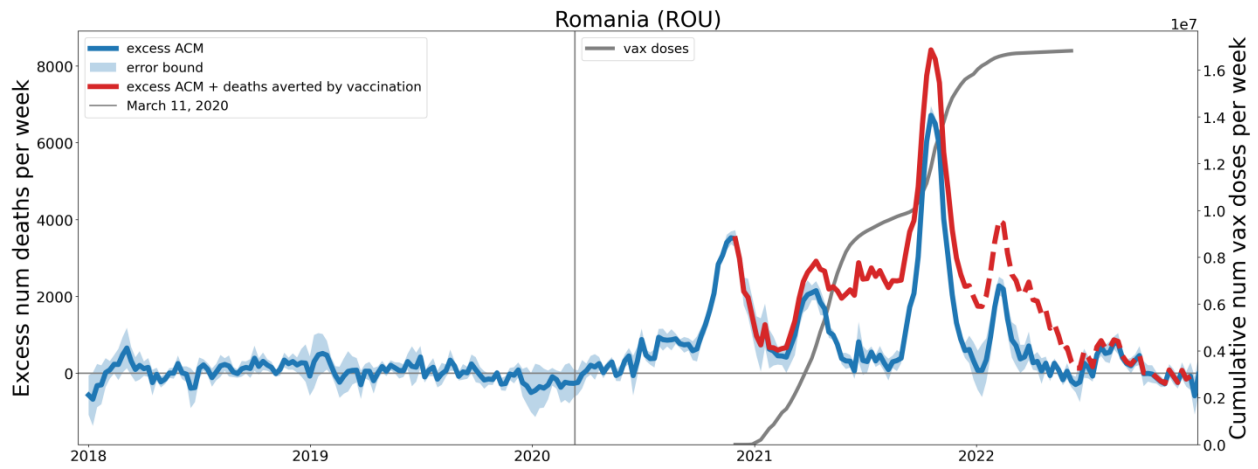
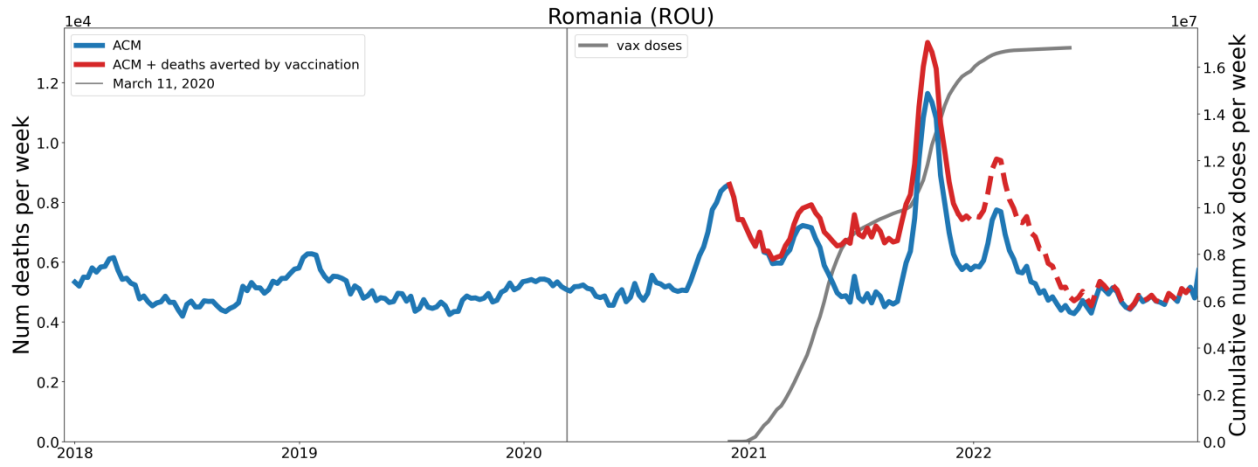


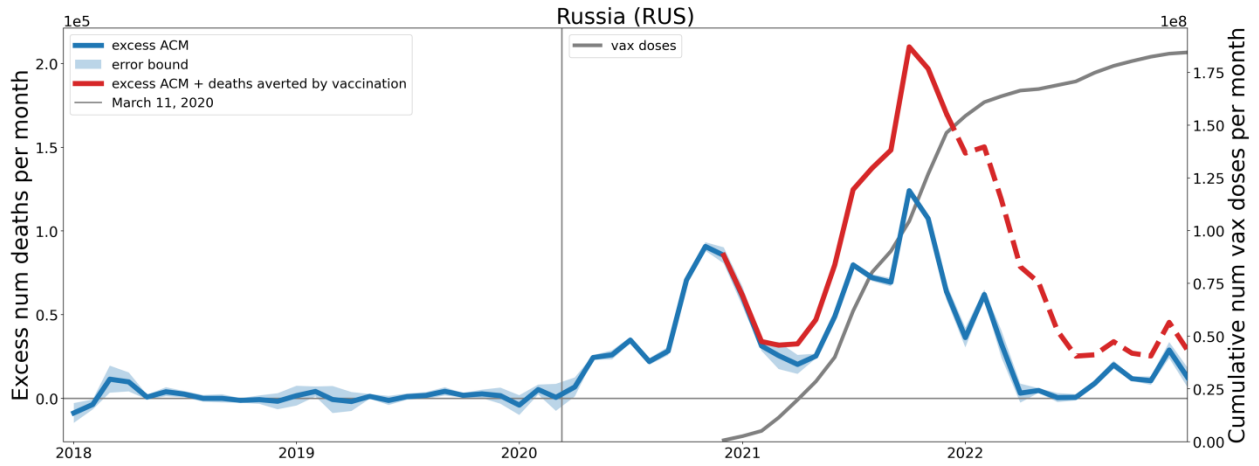
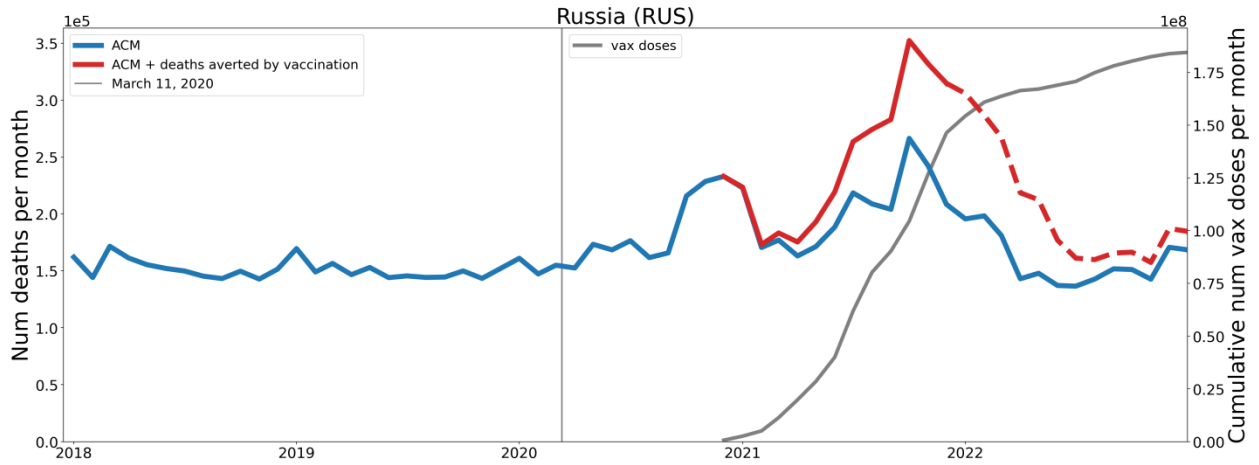


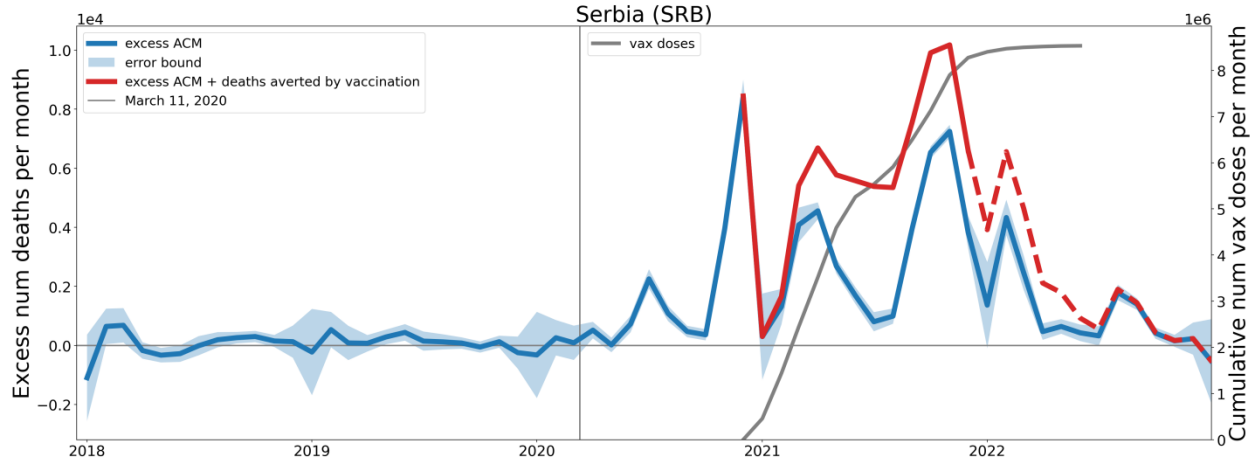
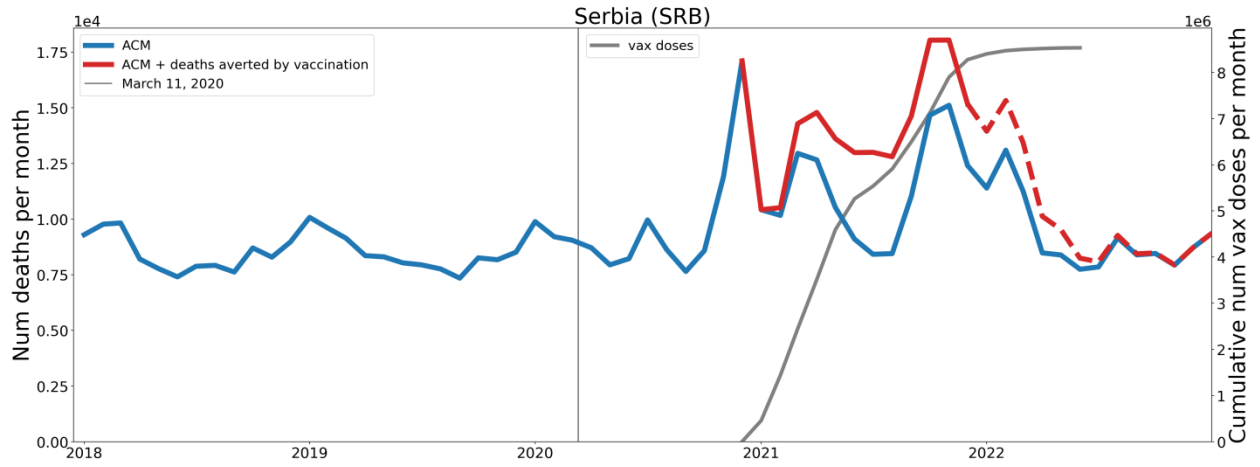


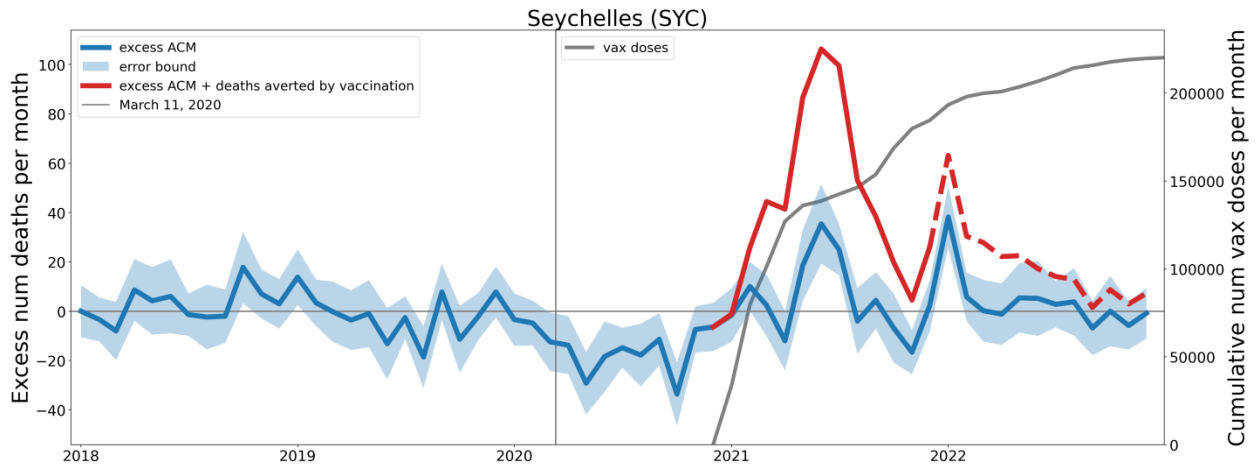
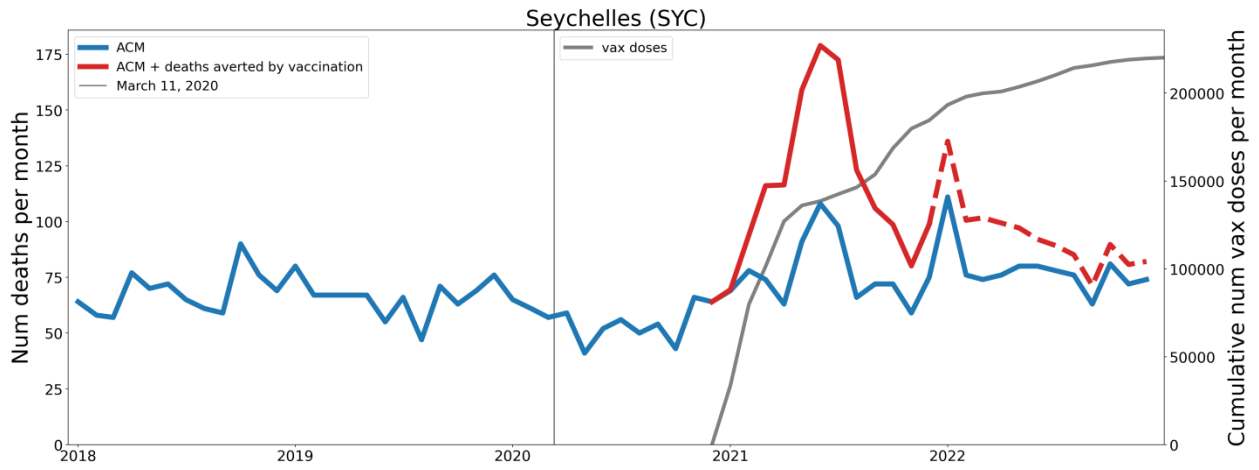


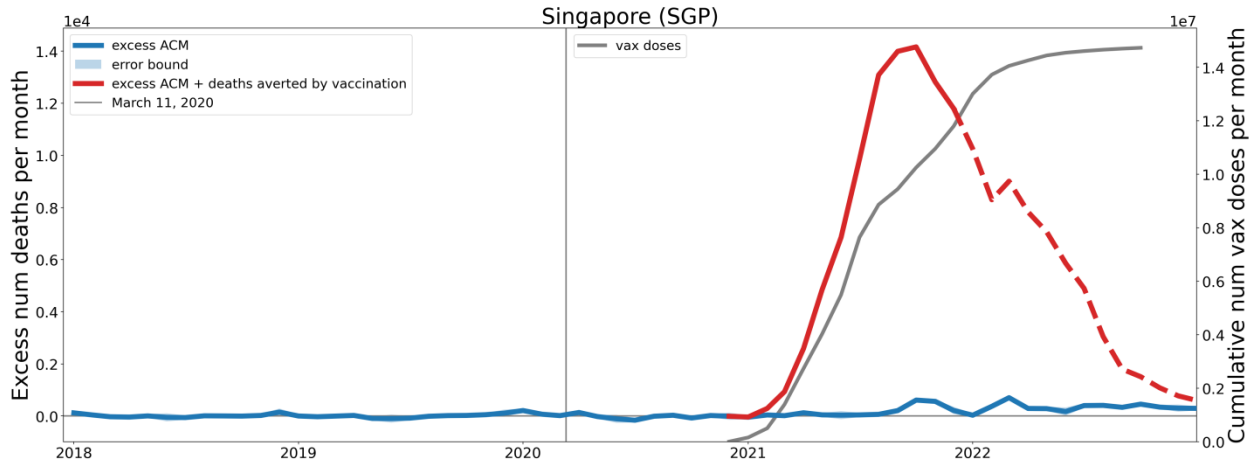
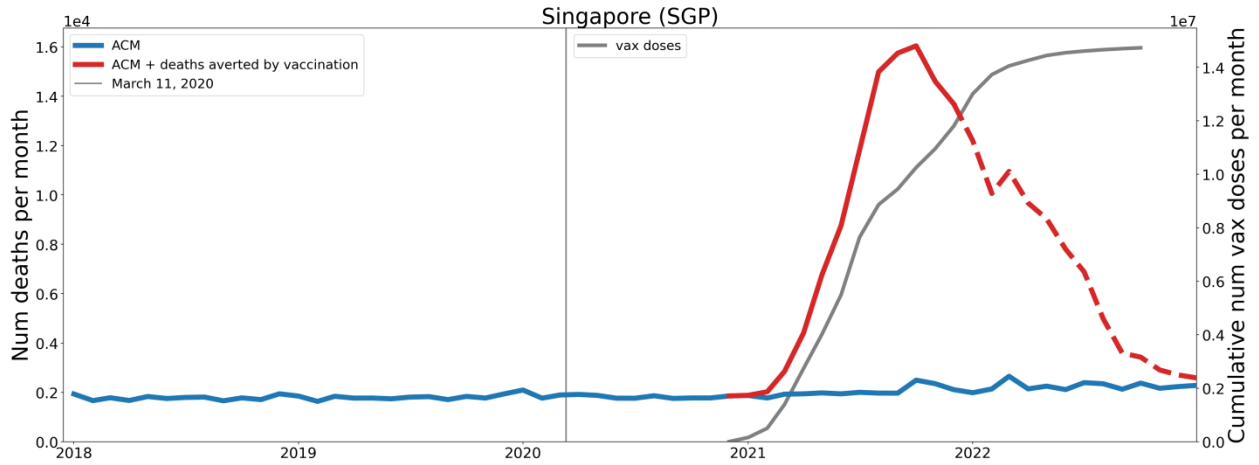


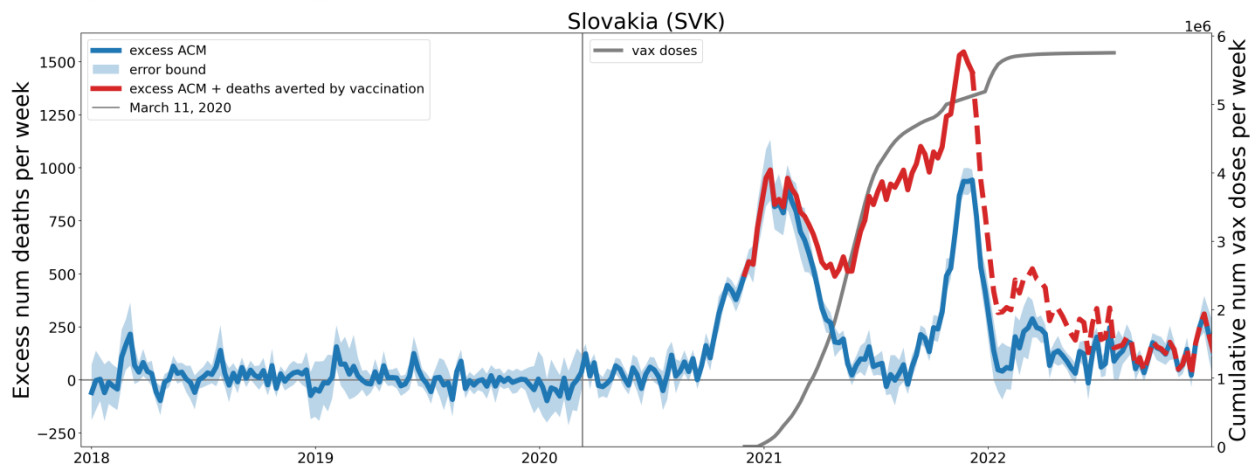
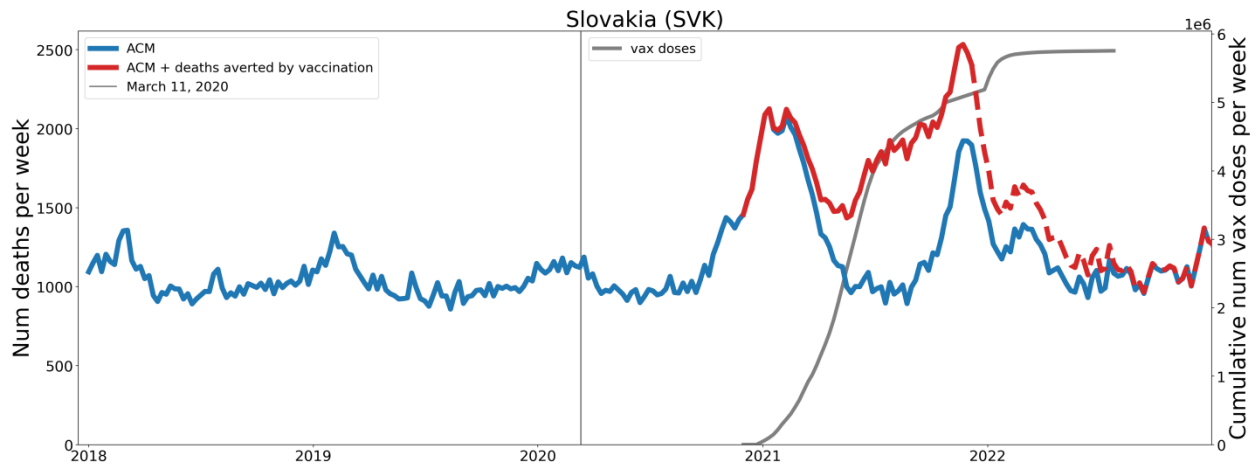


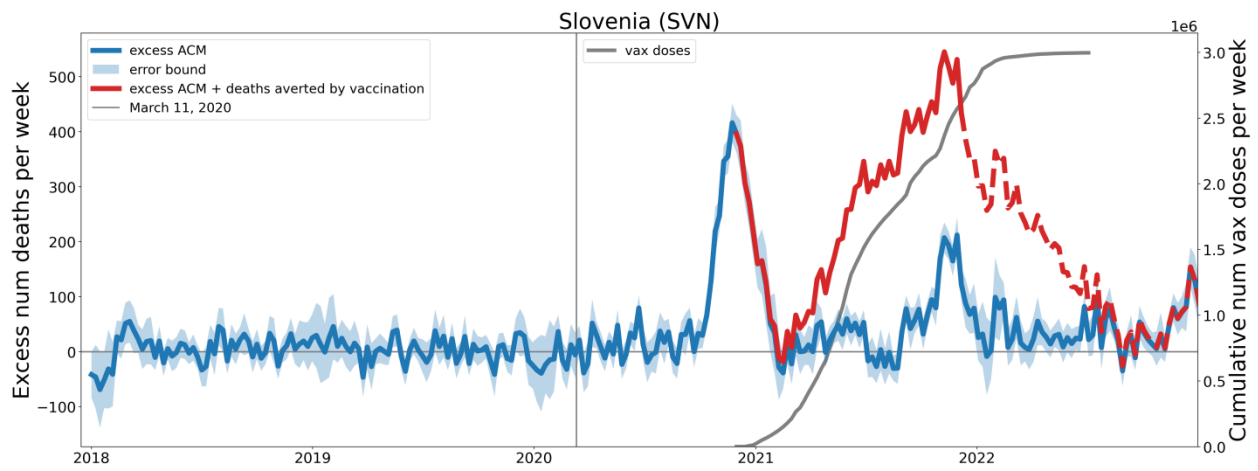
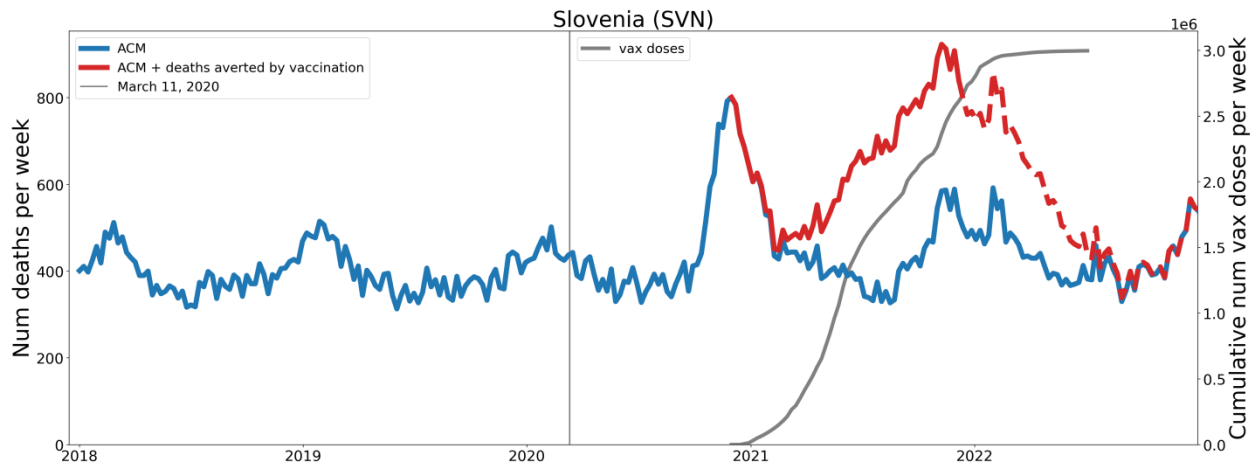


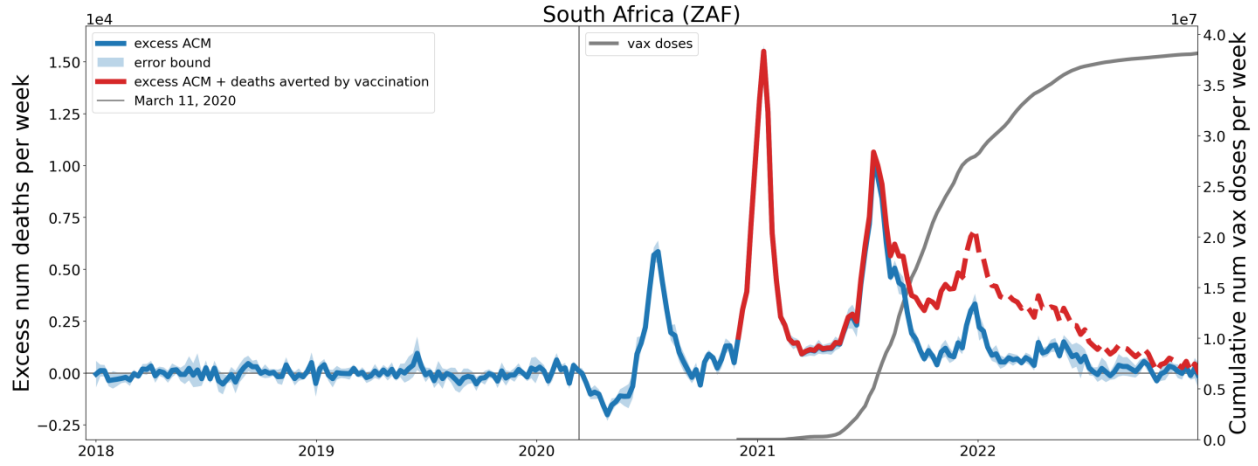
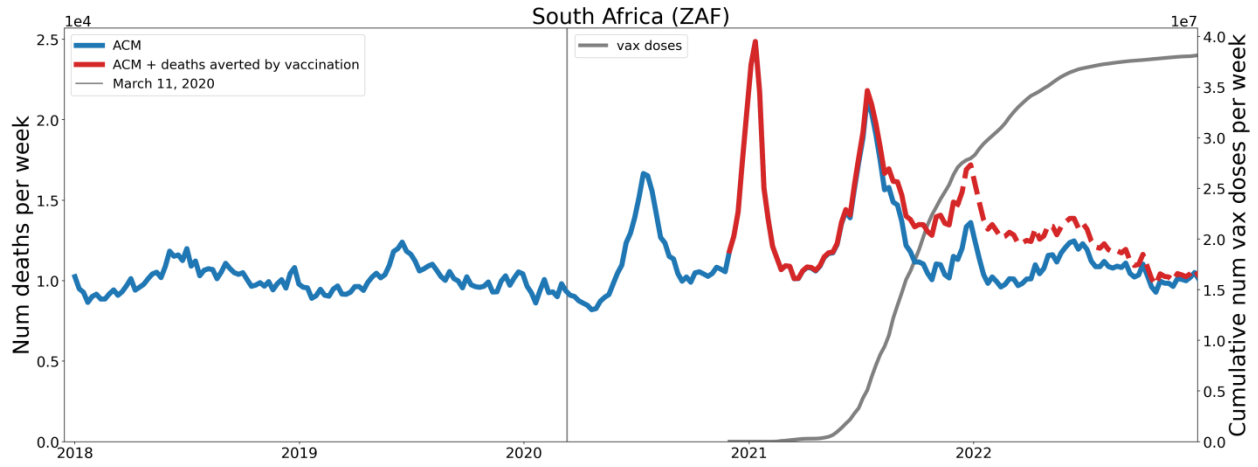




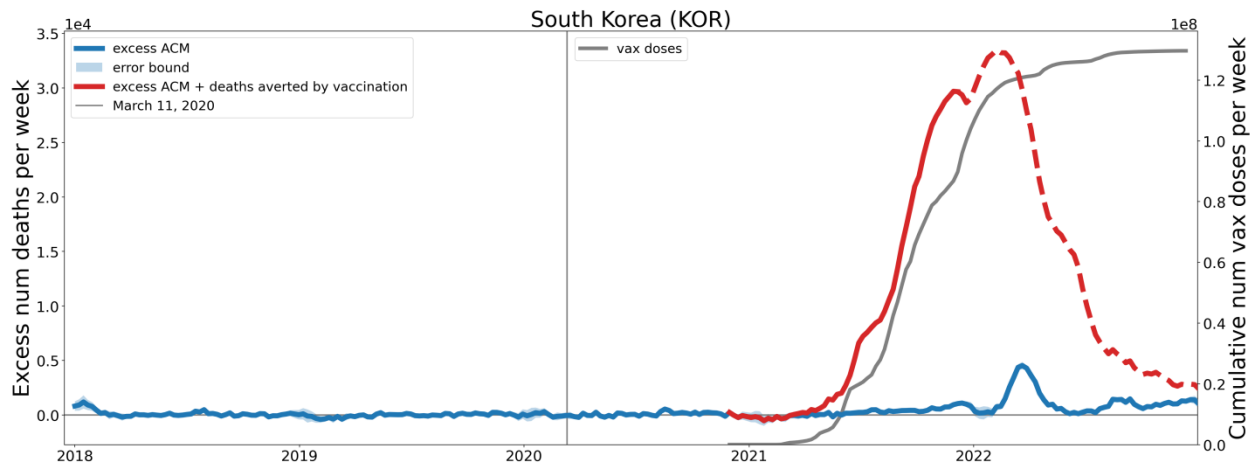
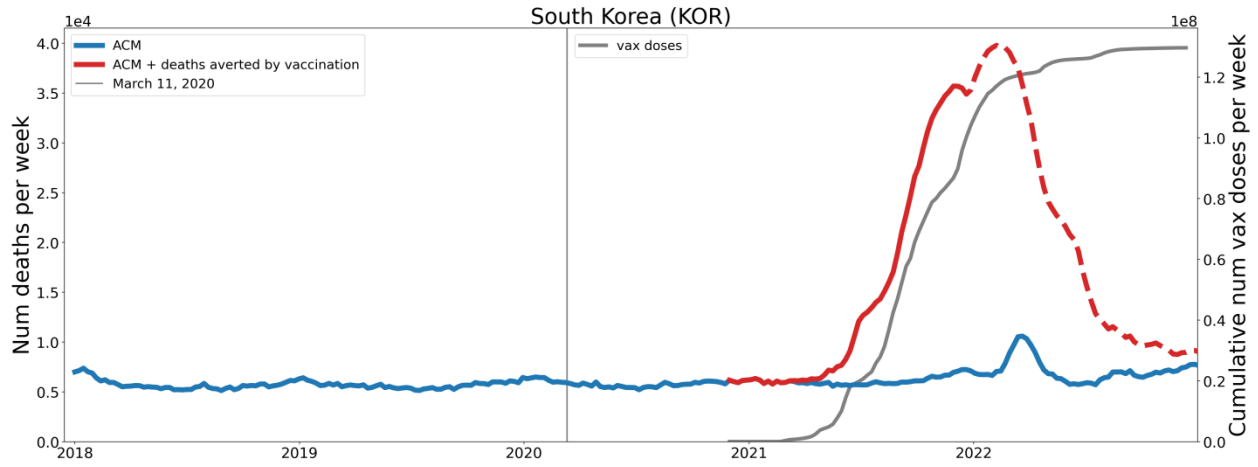


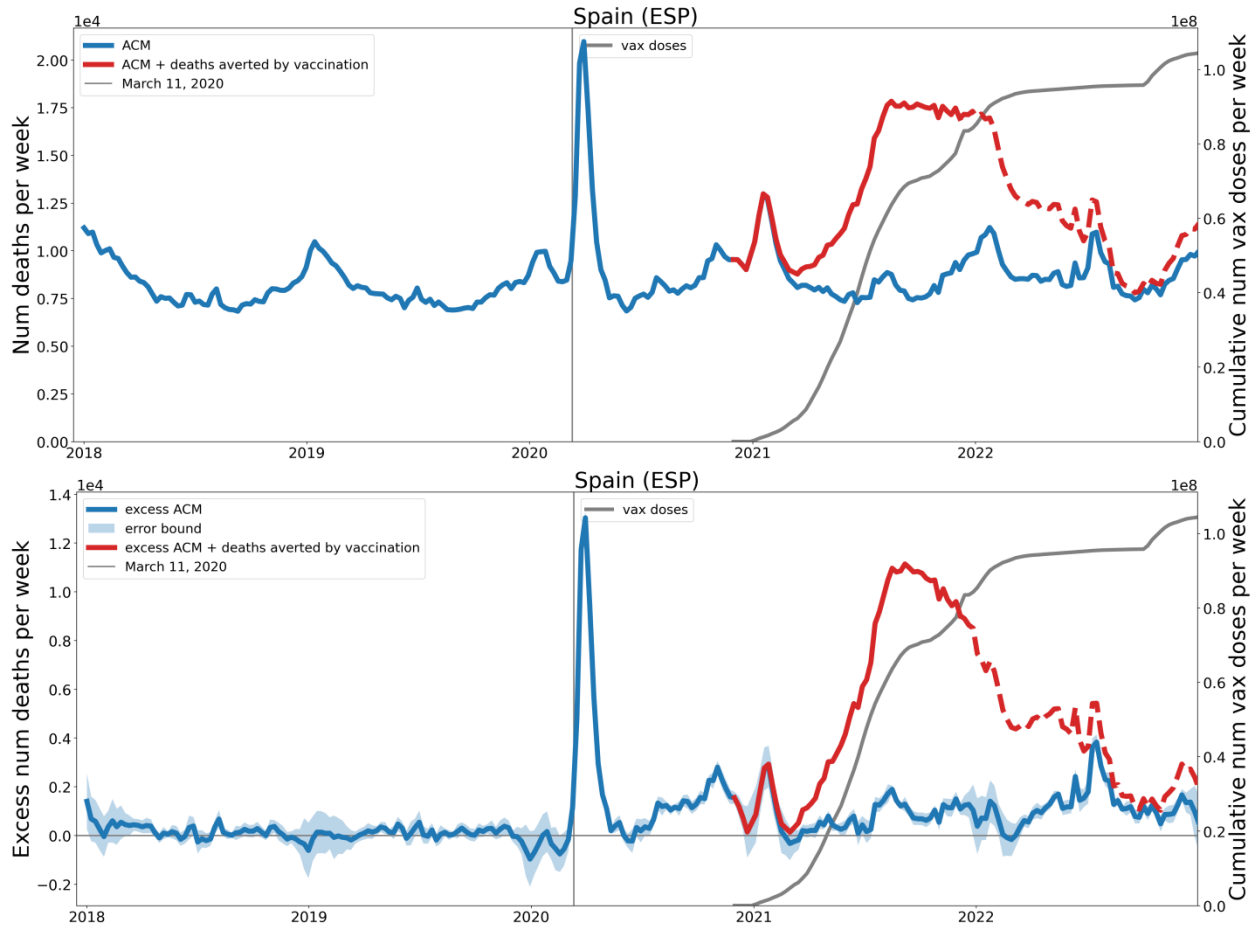


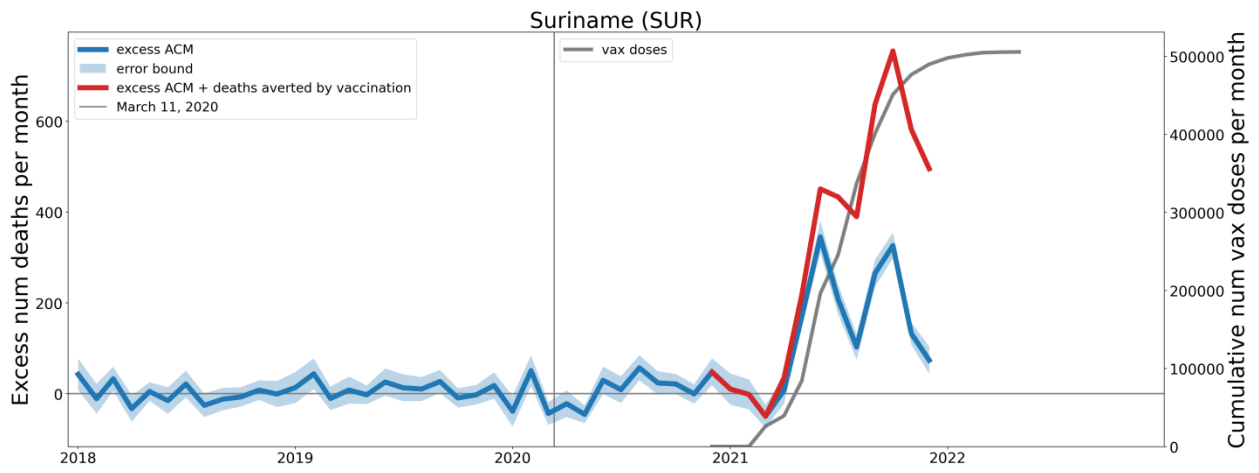
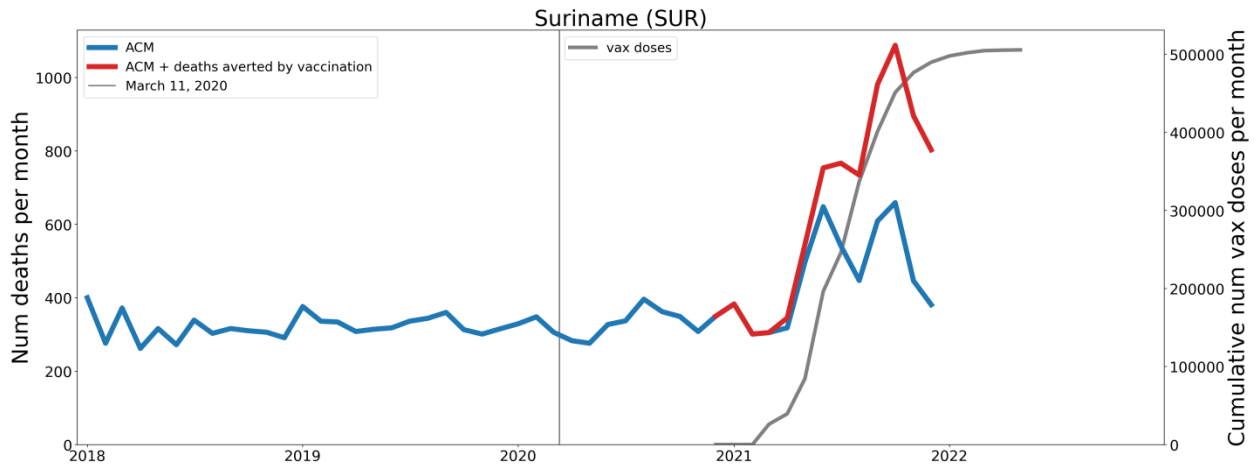


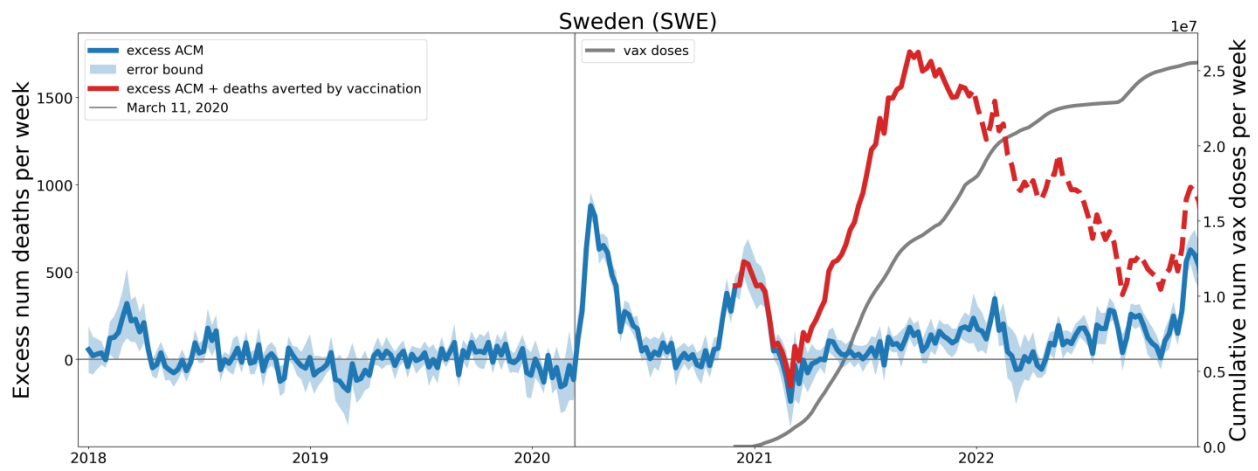
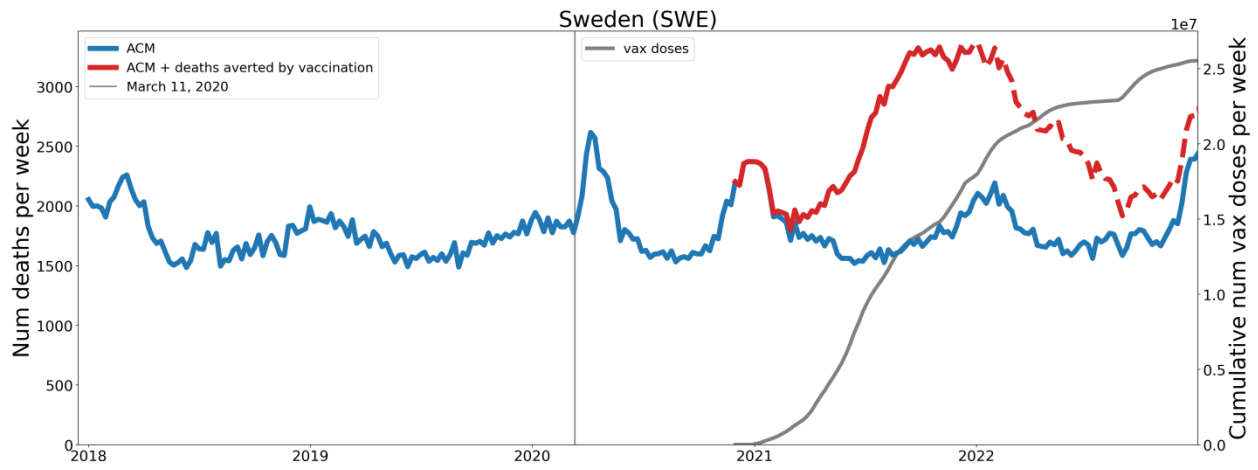


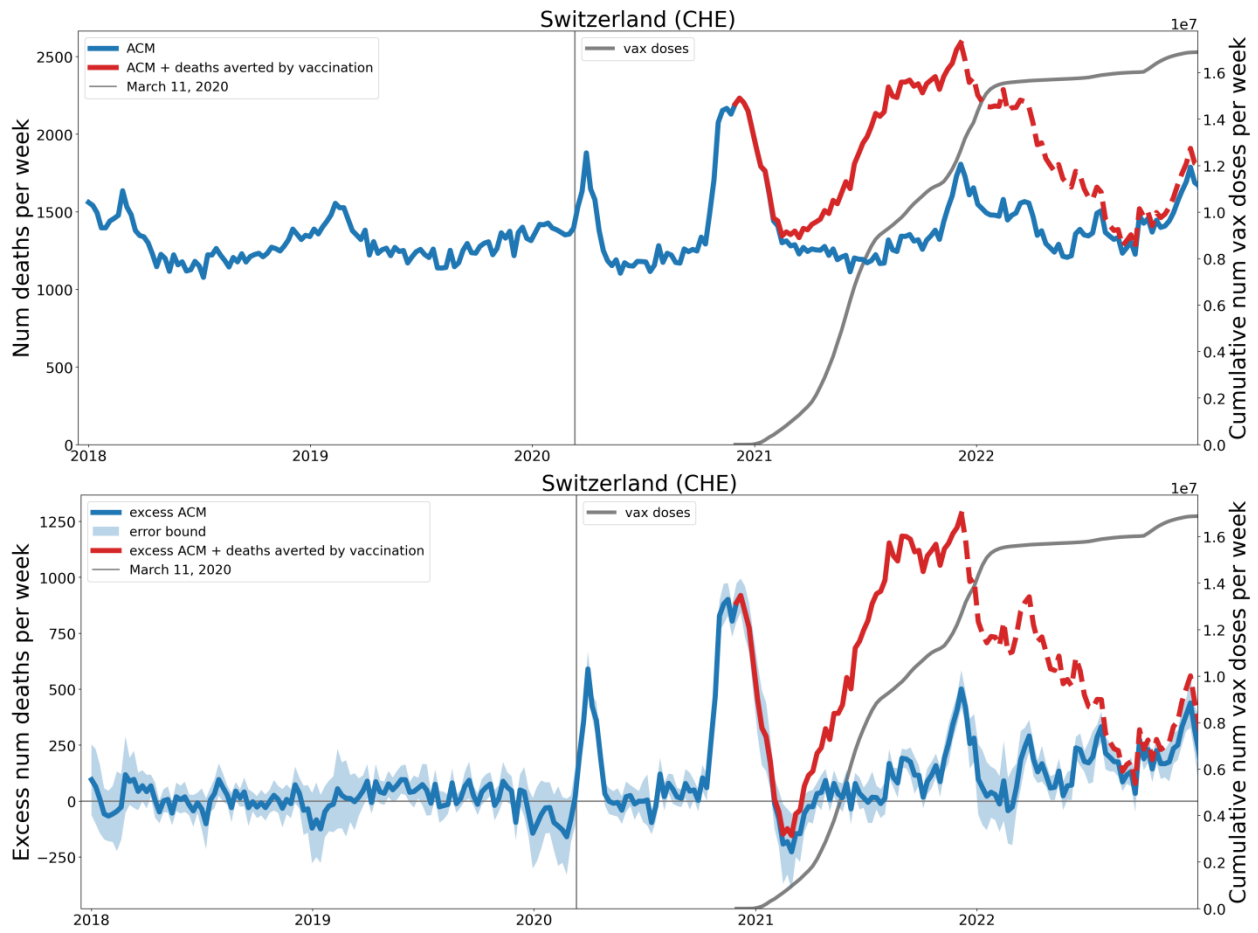


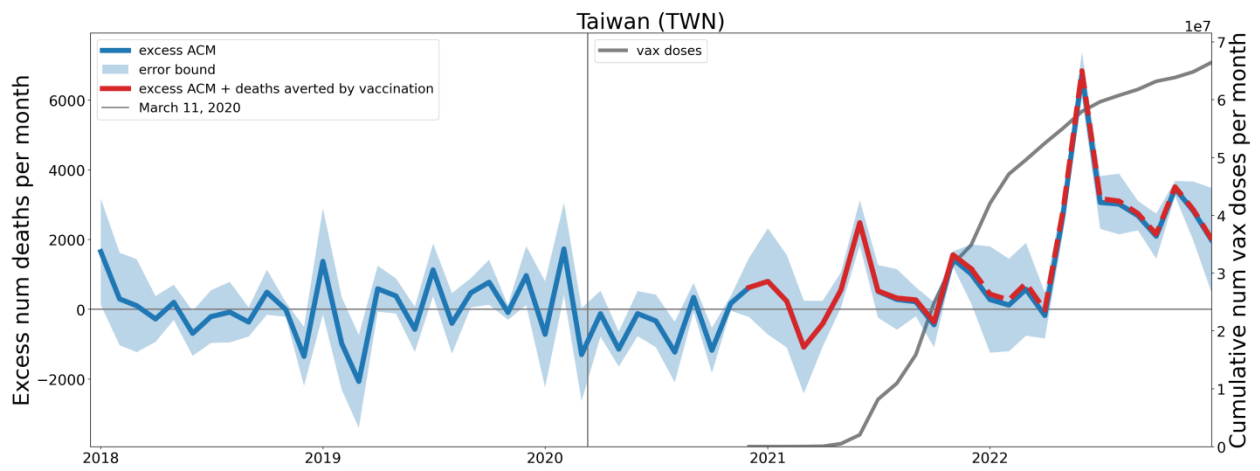
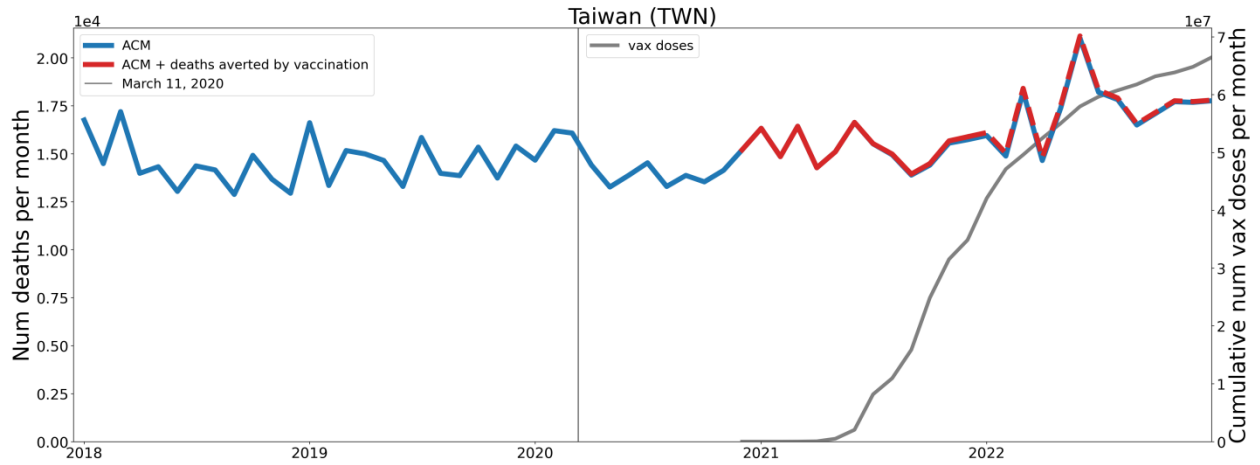


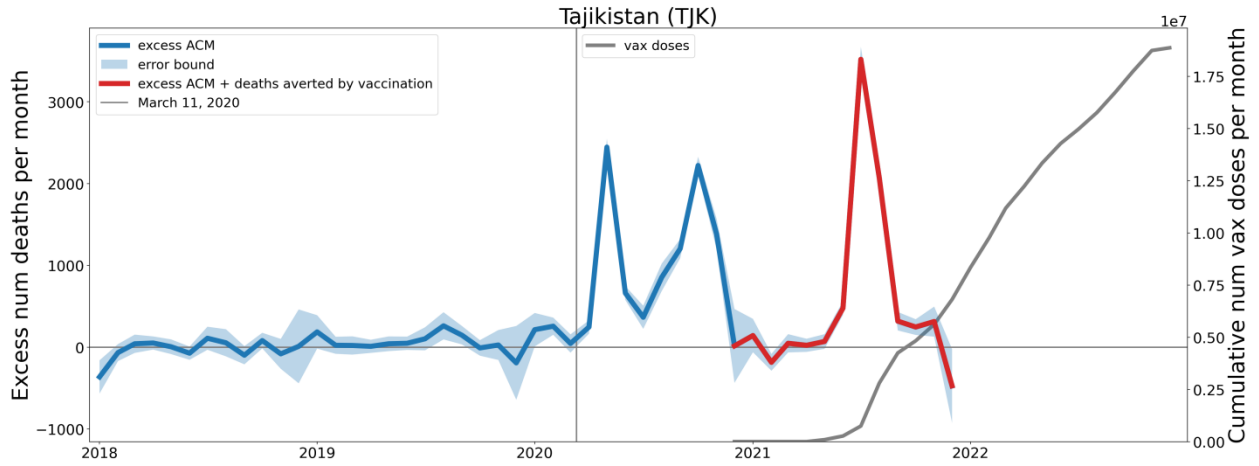
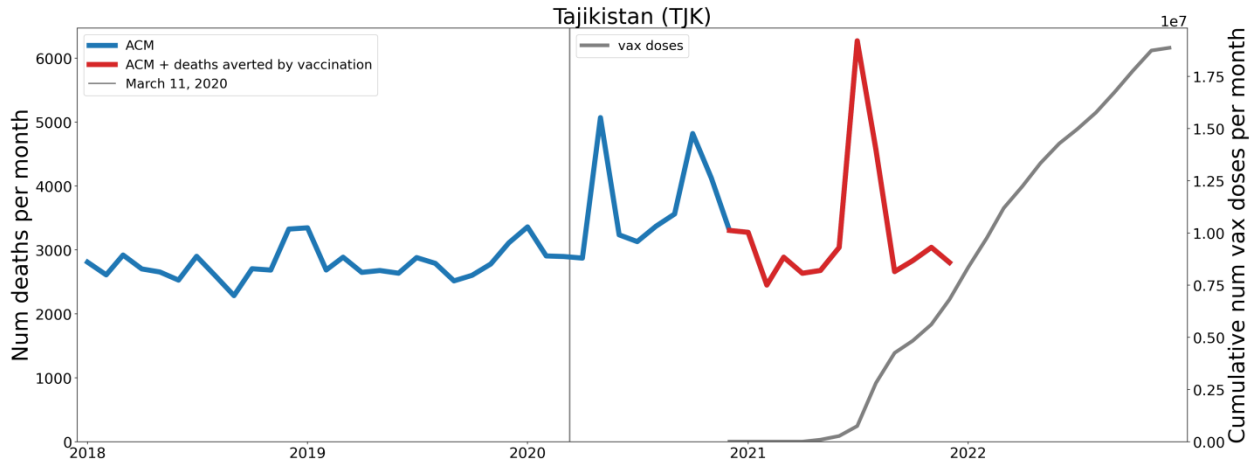


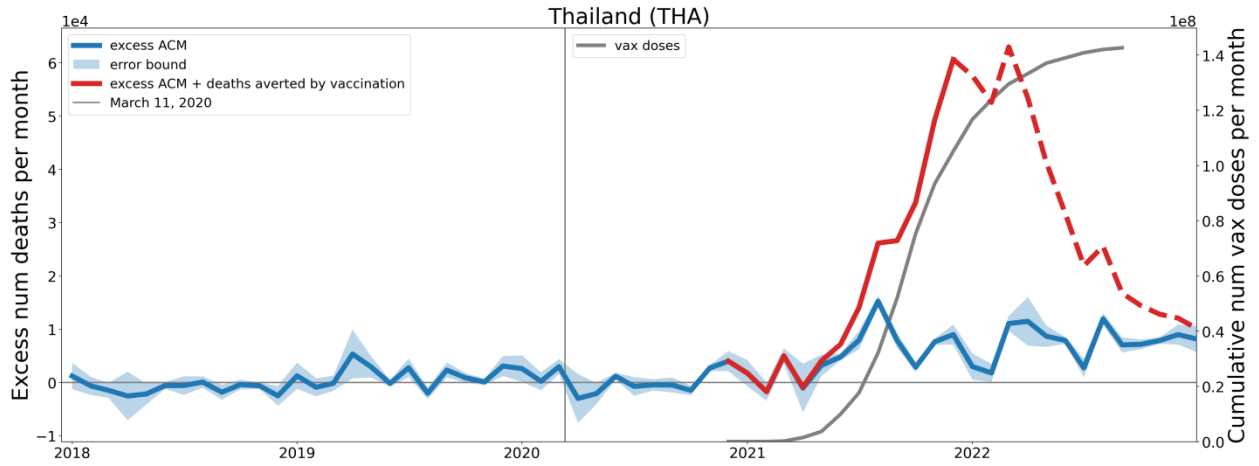
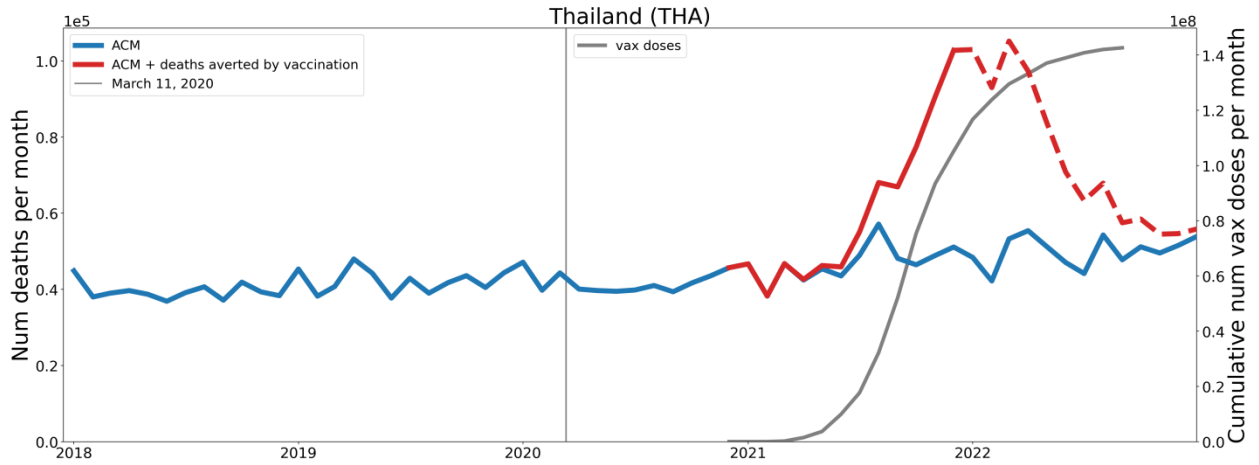




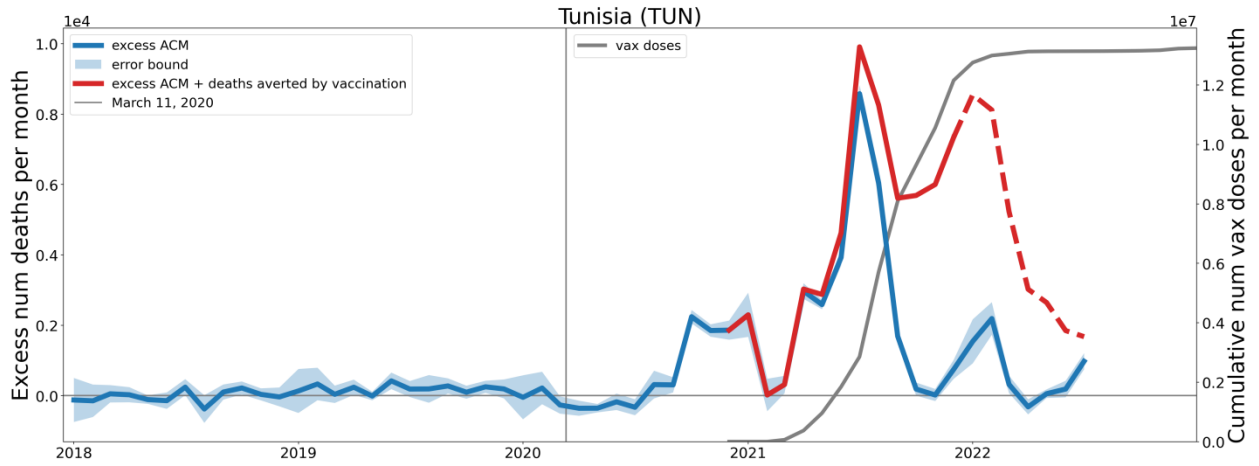
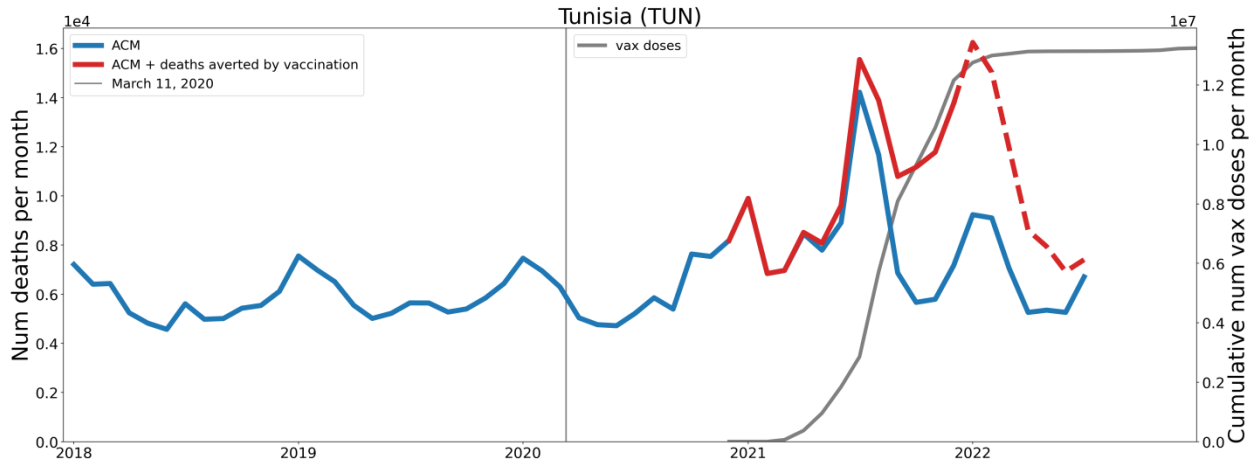


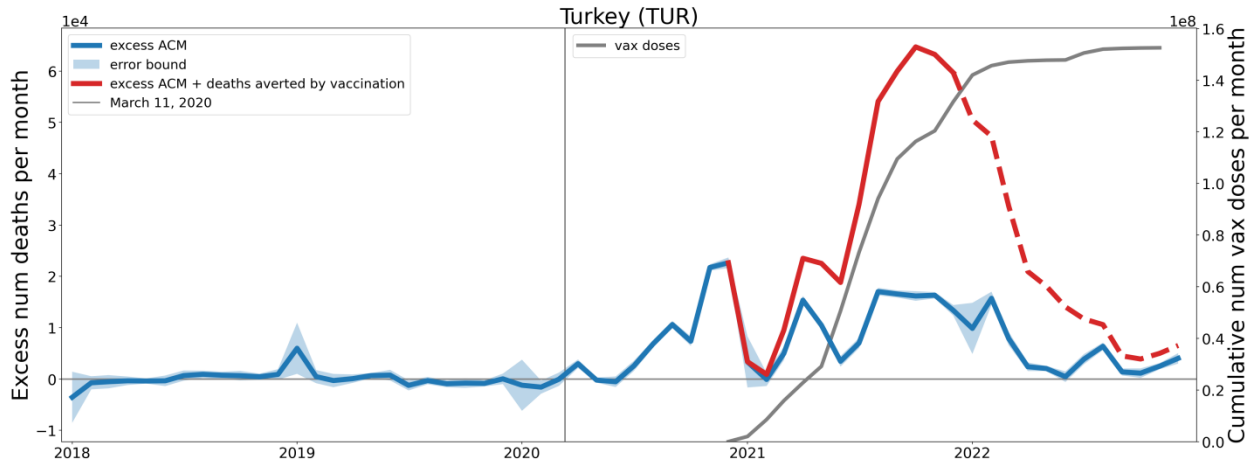
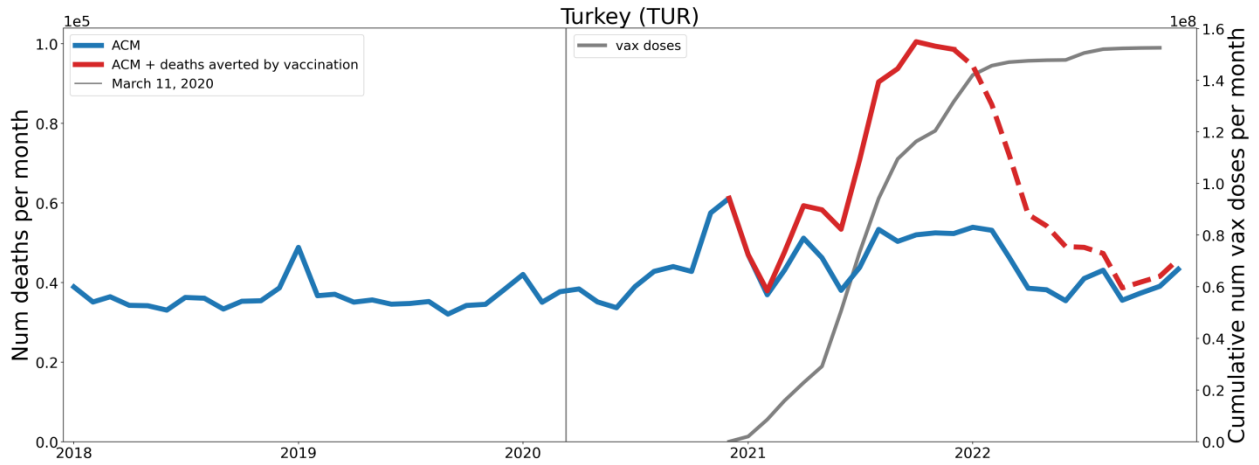


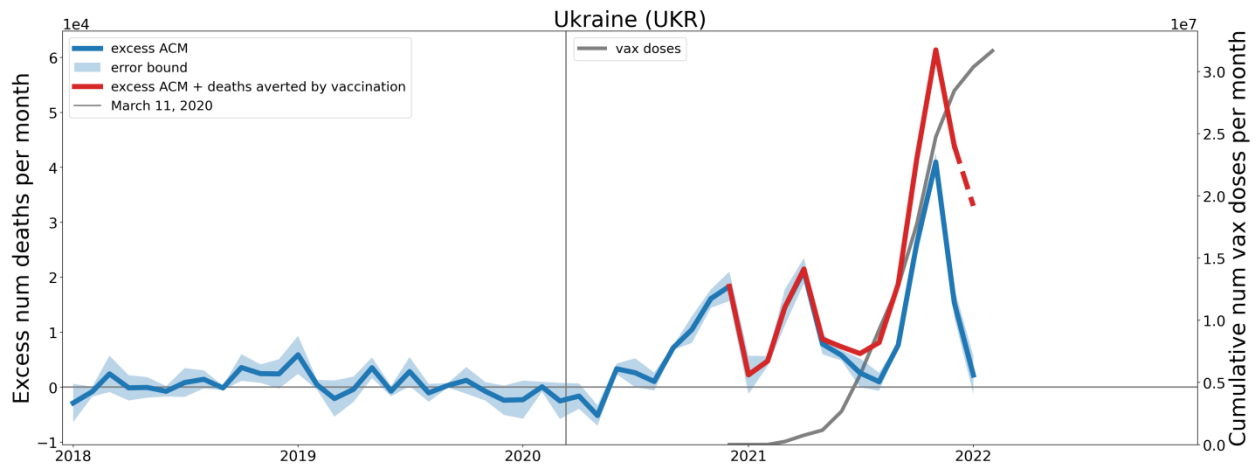
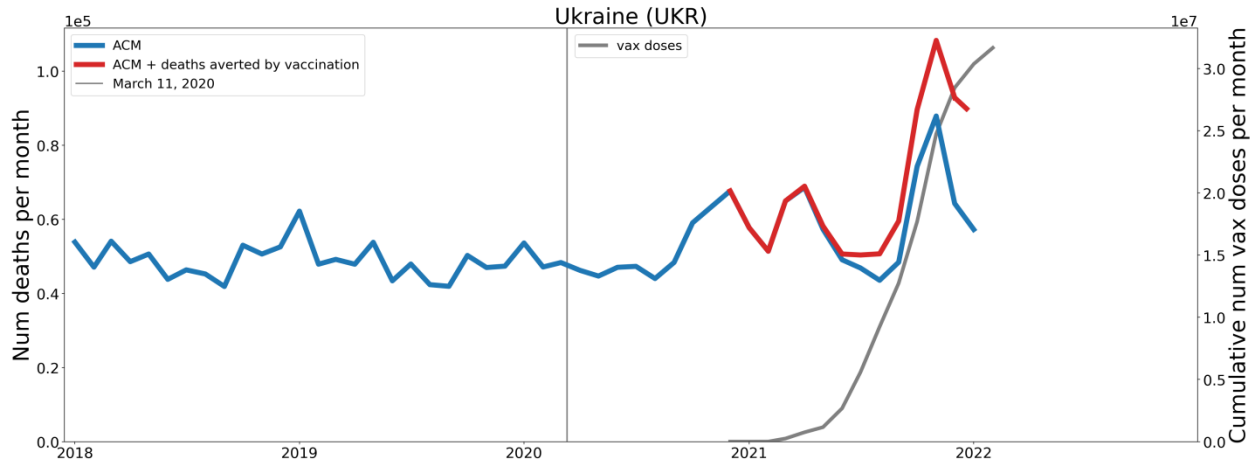


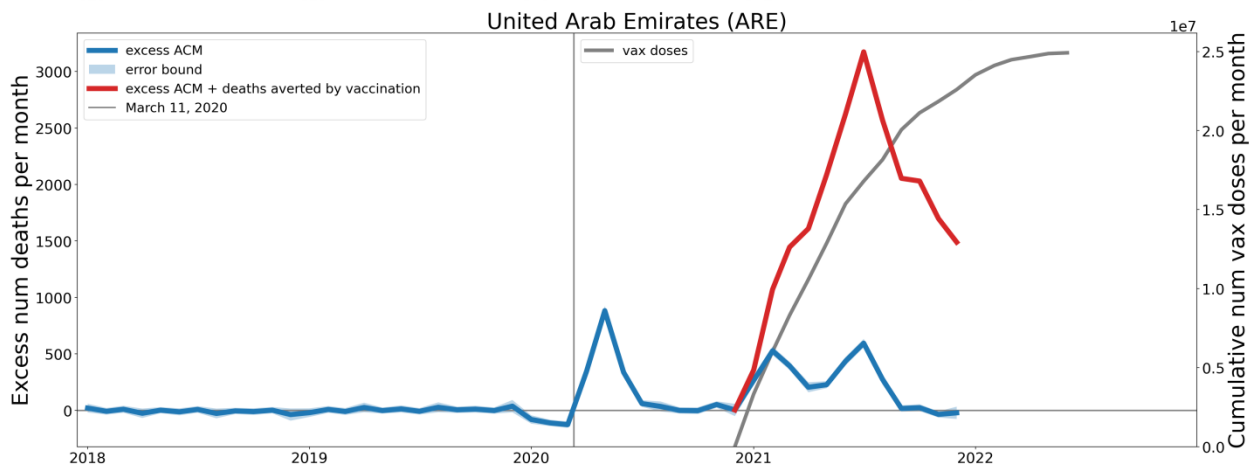
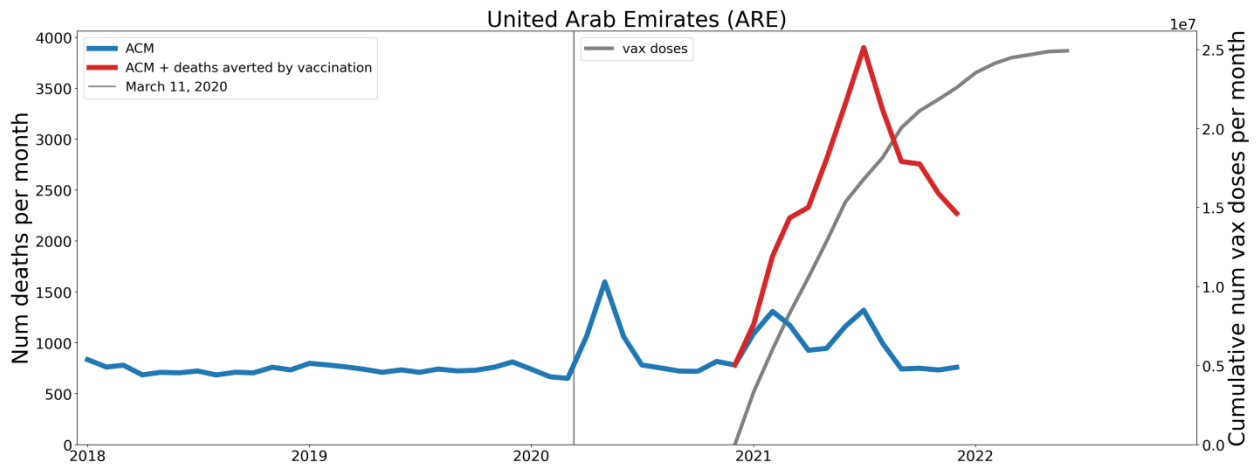


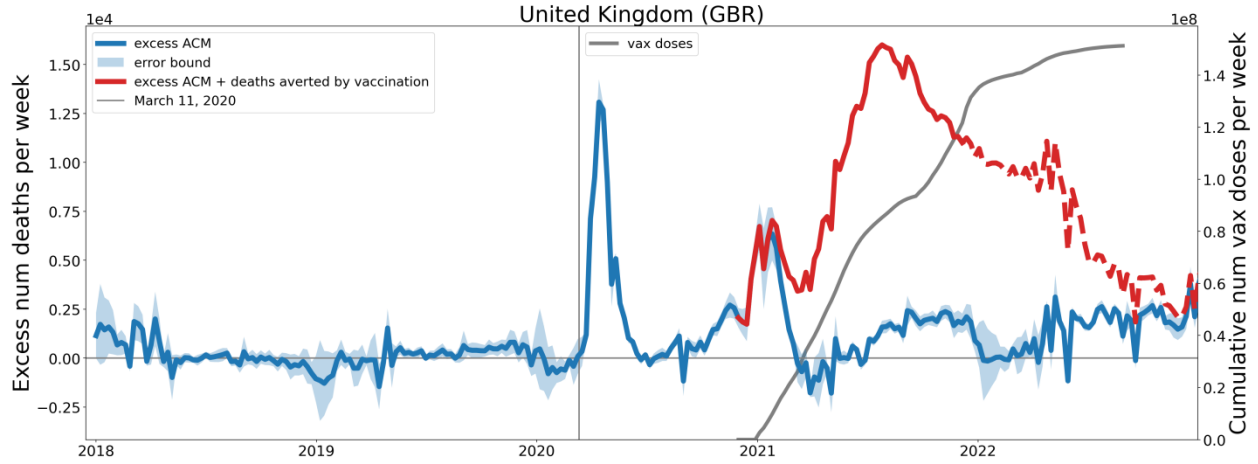
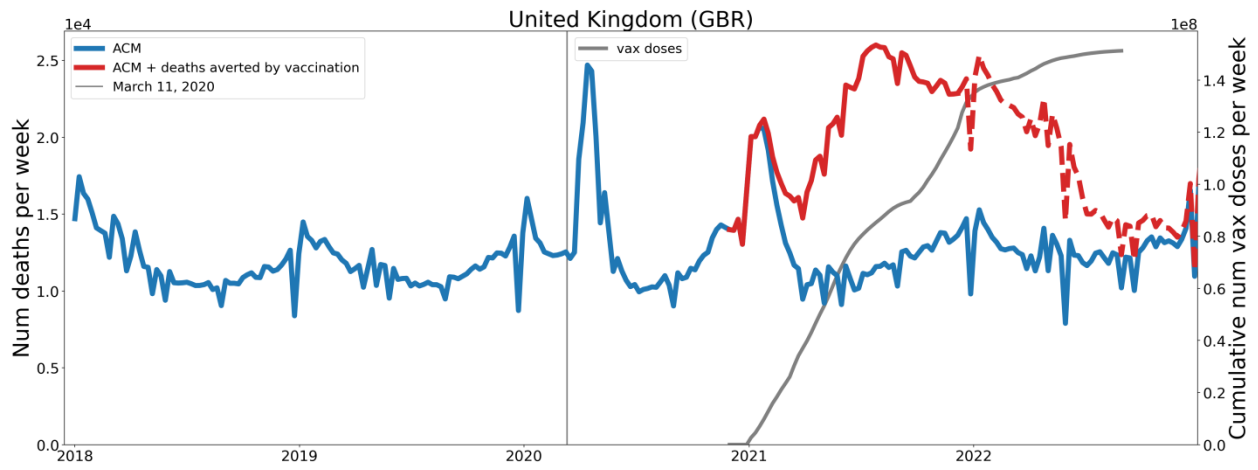


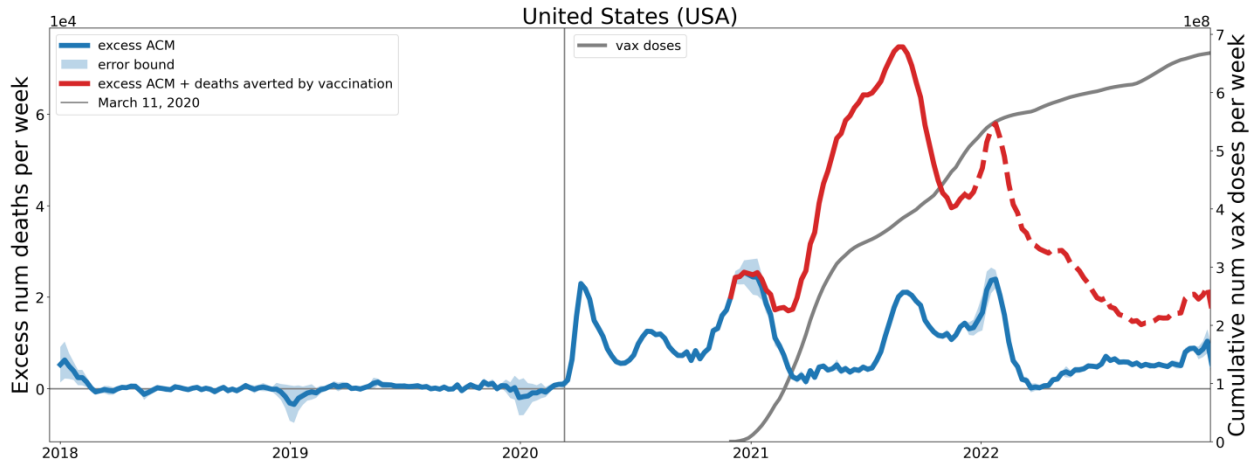
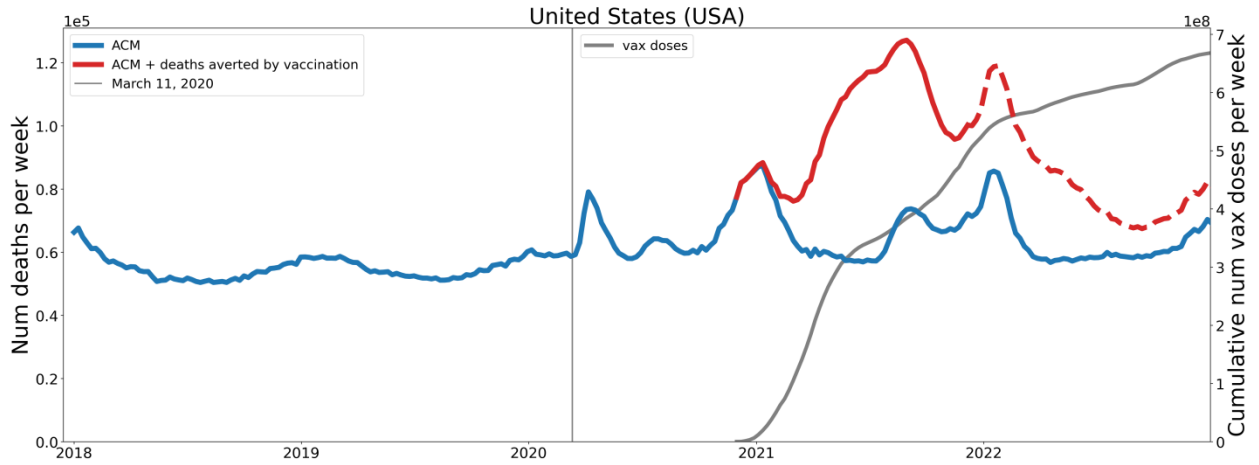


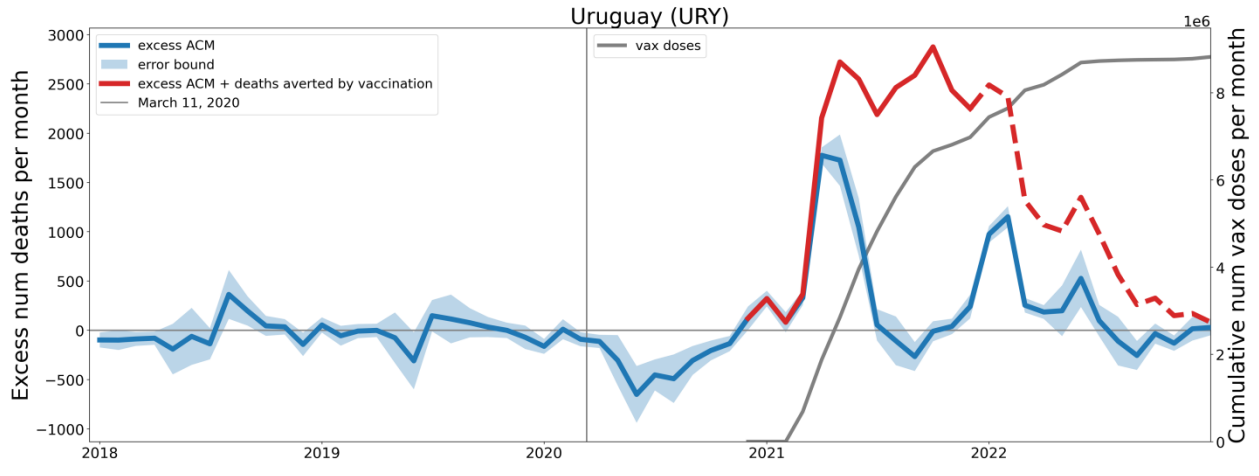
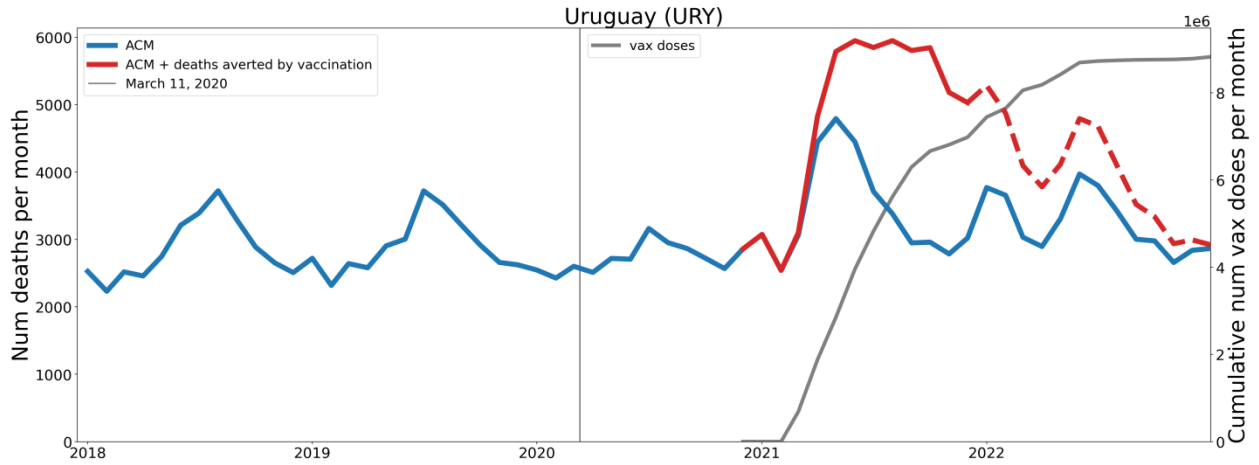


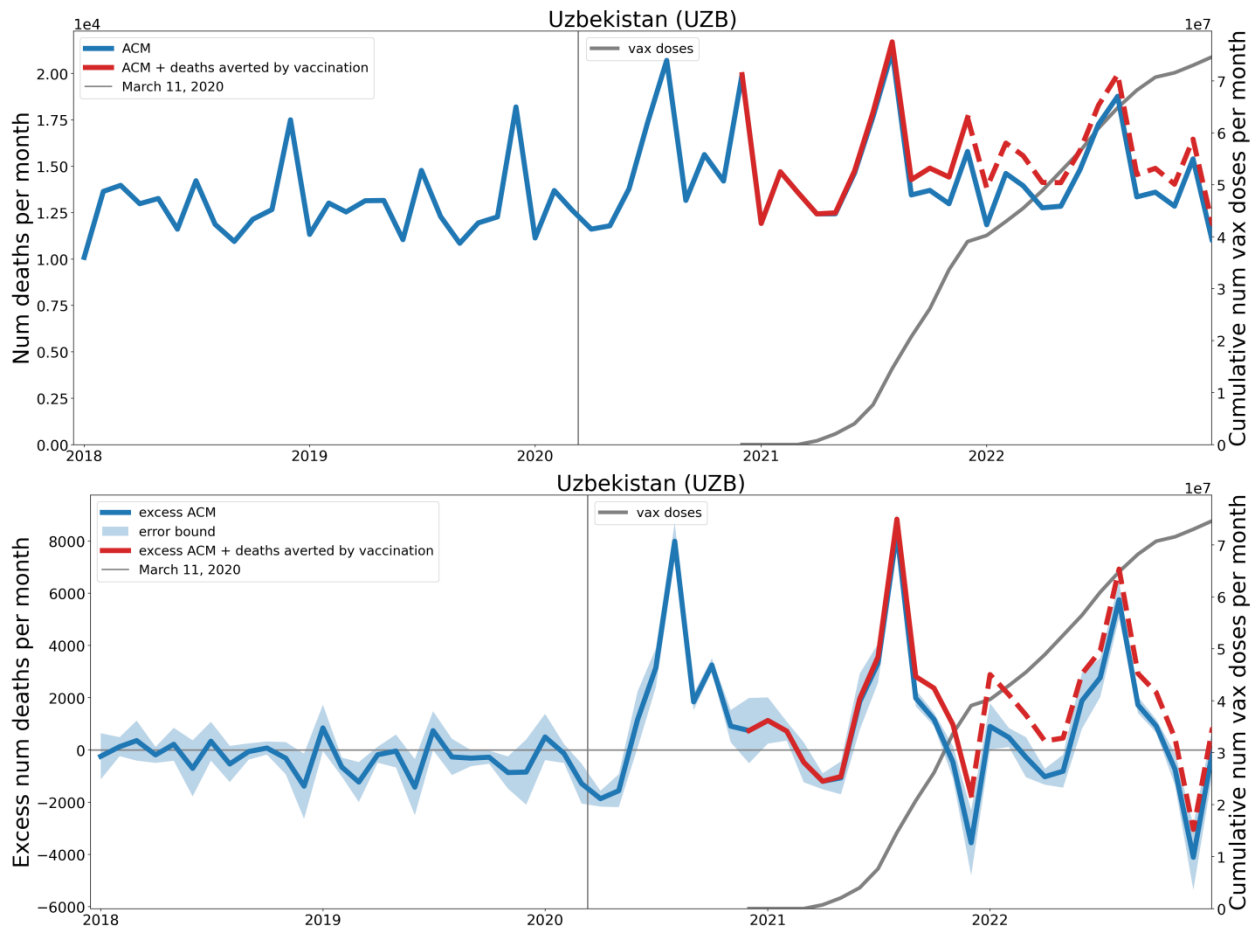












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