PHIRI
Population Health Information Research Infrastructure

EUROPEAN PUBLIC HEALTH CONFERENCE
BERLIN | 9-12 NOVEMBER 2022

Showcasing PHIRI use case results measuring the impact of COVID-19 on population health

Workshop – 10th Nov. 2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

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The Population Health Information Research Infrastructure for COVID-19:

- a **European mechanism**, that aims to
- facilitate and support **data-driven population health research**
- and **exchange of best practices**
- to support **decision making**

41 partners

30 countries

3 years

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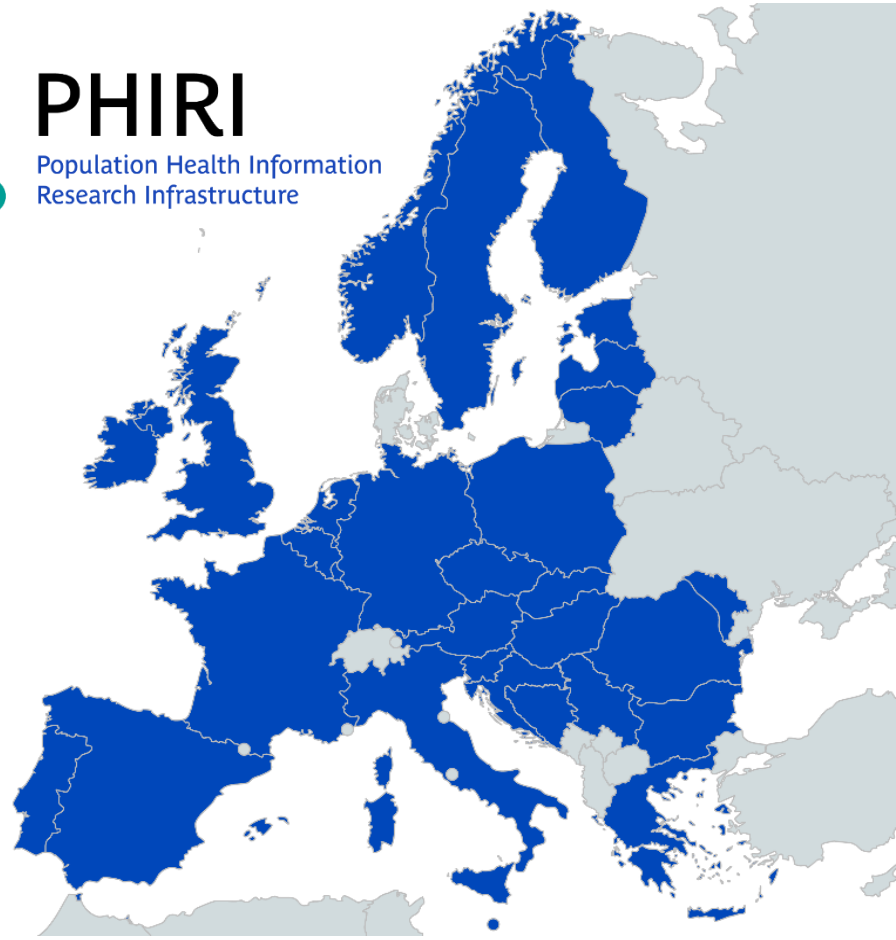

Map of PHIRI Partners

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The European Health Information Portal

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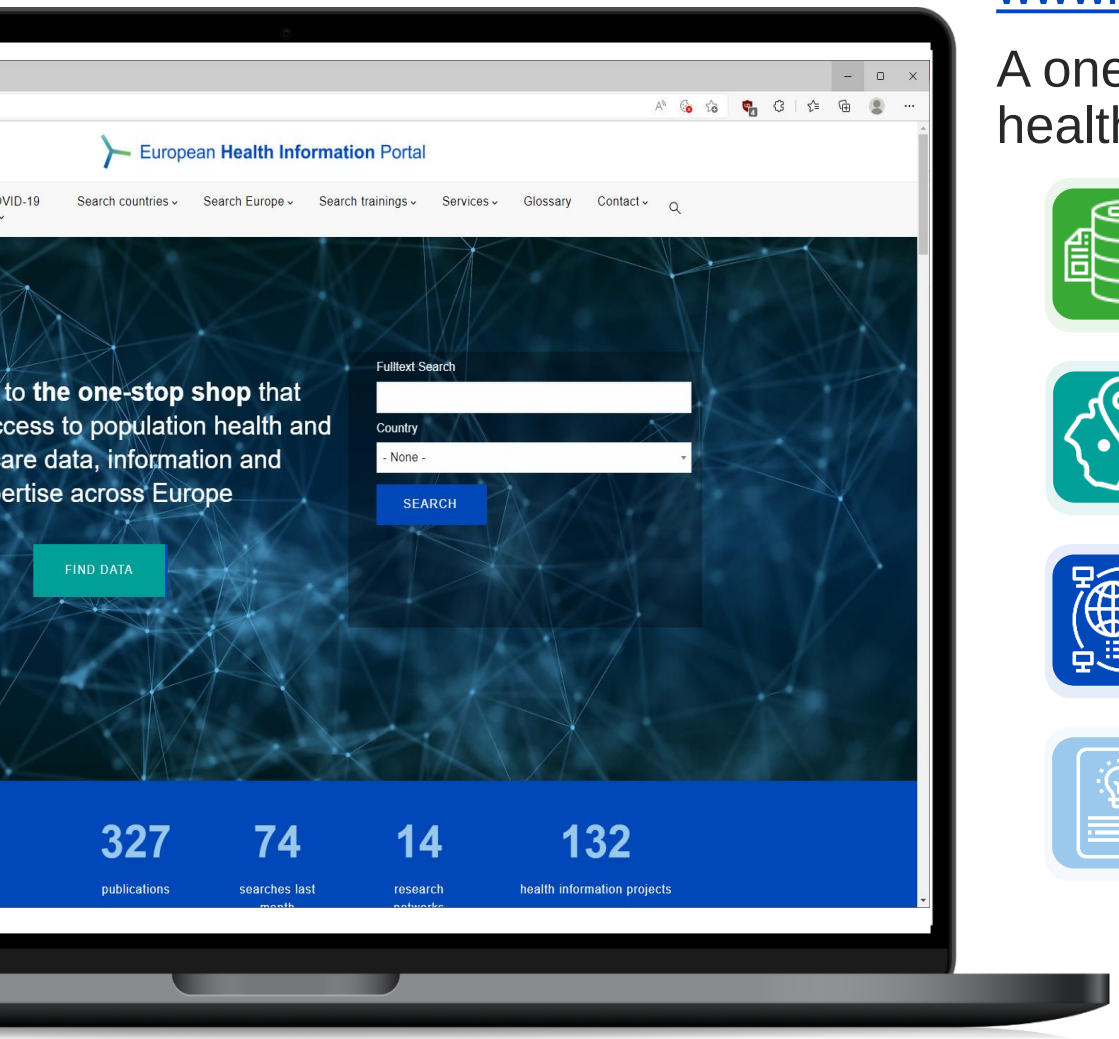

www.healthinformationportal.eu

A one-stop shop that facilitates access to population health and health care data, information and expertise across Europe.

- **Health information (data) sources**
- **Publications**
- **Countries and national nodes**
- **Trainings in all areas of population health**
- **Research infrastructures, Research networks**
- **COVID-19 Policy measures**
- **Health information projects**
- **COVID-19 Rapid Exchange Forum**

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PHIRI: Real-world data measuring the COVID19 indirect “impact”

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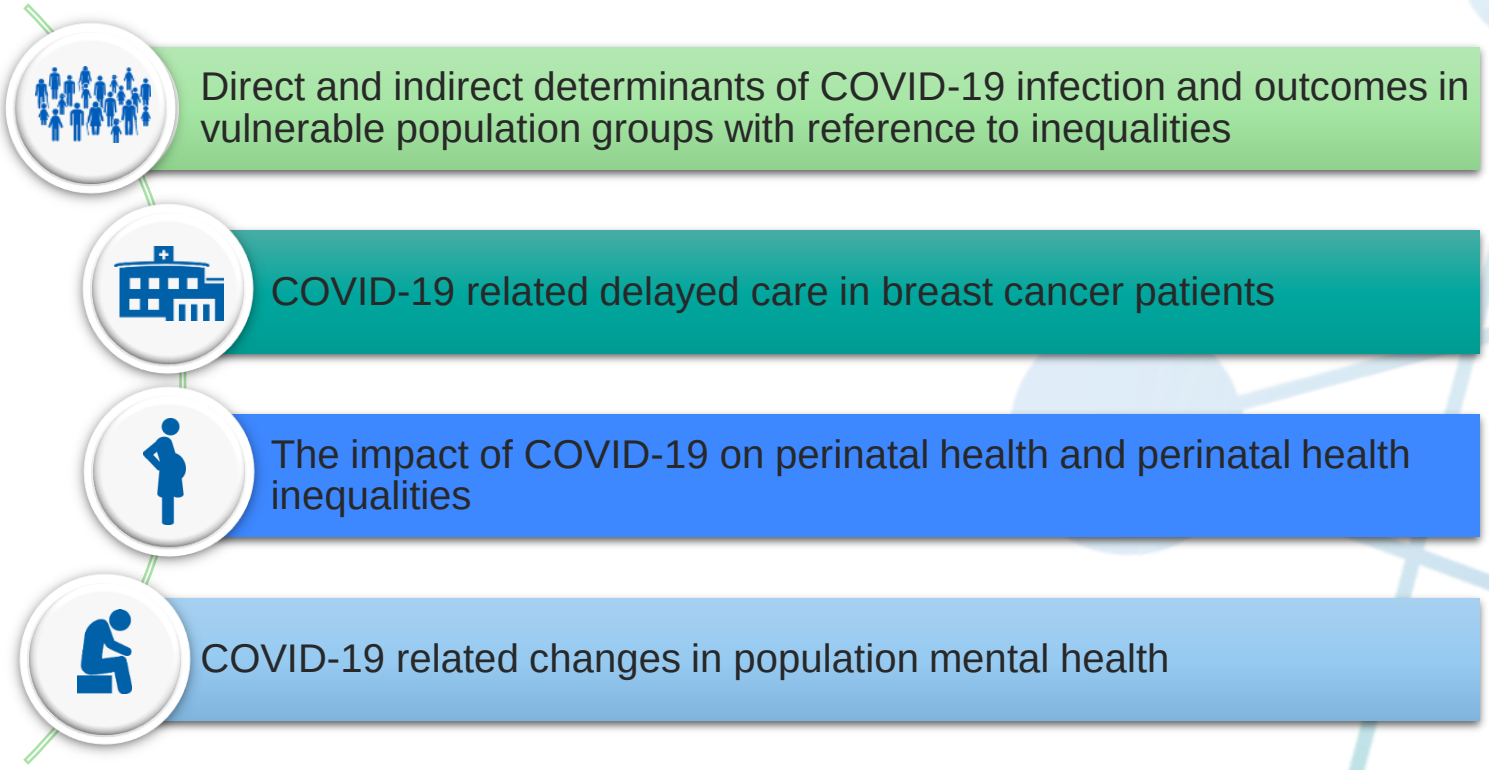

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Use Case A: Indirect health effects of the COVID-19 pandemic: Insights from European countries

Sarah Aldridge, Swansea University and
Andrea E. Schmidt, Austrian National Institute of Public Health

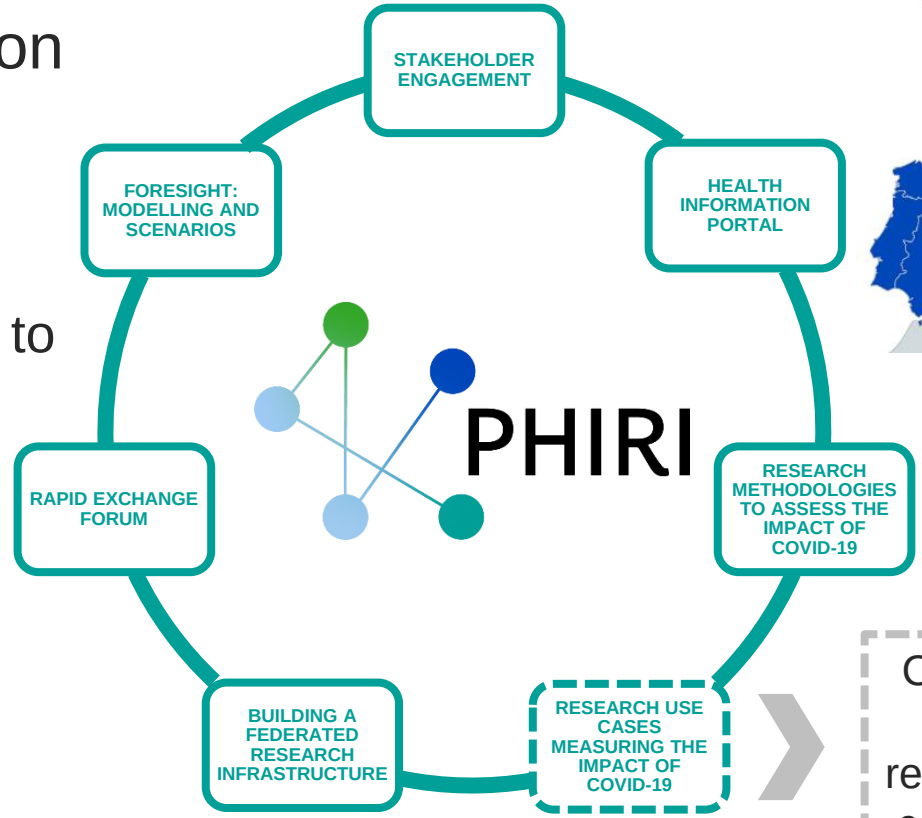
With: Ronan A. Lyons, Claudia Habl, Lorenz Dolanski-Aghamanoukjan, Markus Keski-Säntti, Stefan Mathis-Edenhofer, Hanna Tolonen, Mika Gissler, Jakov Vukovic, Klea Kriz, Tamara Bubble, Enrique Bernal Delgado, Francisco Estupiñan-Romero, Javier, Gonzalez Galindo, Martin Thißen, and others…

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

Background – PHIRI

The Population Health Information Research Infrastructure for COVID-19 is:

- a **European mechanism**, that aims to
- facilitate and support **data-driven population health research**
- and **exchange of best practices**
- to support **decision making**



COVID-19 impacts in specific subgroups by conducting research through 4 real life use cases of immediate relevance

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Use Case A

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- **Research question:**
  Has the COVID19 pandemic changed existing patterns of non-COVID-19 health care utilisation for (vulnerable) populations within and between countries?

- Heart attack and strokes (Cohort 1)
- Hip and knee replacements (Cohort 2)
- Serious trauma admissions (Cohort 3)

- **Method:** Compare age-standardised utilization rates for each month of 2020 (and possibly 2021) compared with pre-existing trends during 2017-2019, supplemented by ecological analyses and comparisons using data on infections and hospitalizations from ECDC.

Objectives of the study:

- ✓ Demonstrate how a broad variety of secondary data (e.g. administrative and survey data) can be pooled and/or reused in a distributed way across Europe
- ✓ Gain insights into the situation of socially (and potentially clinically) vulnerable groups during the COVID-19 pandemic
- ✓ Understand gaps in health system performance during crisis
- ✓ Develop learnings on system resilience and inclusive pandemic preparedness

Common data model

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	Associated entity in ERD	Label (var_label)	Name (var_concept)	Classification/Encoding	Units	Format	Description
basics	patient	**patient_id**	patient identificator	private key ciphering function	none	string	patient pseudonymized identificator
	patient	**sex**	sex				
	patient	**age_nm**	age	none	years	integer	patient's age as of 2019-01-01
	observation period	**period**	[time period]	none	month	integer	natural month
cohort 1	heart event	**acute_event_heart**	major vascular event - heart attack	ICD10:I21			
	date heart event	**date_event_heart**	date - heart attack	date	date_DMY_nr	YYYY-mm-dd	
	stroke event	**acute_event_stroke**	major vascular event - stroke	I60-I64			
	date stroke event	**date_event_stroke**	date - stroke		date_DMY_nr	YYYY-mm-dd	
cohort 2	procedure	**ttm_type_cd**	type of treatment	types of treatment referred	none	integer	type of treatment received by the patient
	procedure	**surgery_elective_hip**	elective surgery, hip joint replacement	OPCS codes in UK W37-W39			
	procedure	**surgery_elective_knee**	elective surgery, knee joint replacement	OPCS codes in UK W40-W42			
cohort 3	condition	**acute_event_trauma**	hospital admission for trauma based on	ICD10: S720, S721, S722, S723,	none	string	Based on scientific analysis by New
	Date of event	**date_event**	date of admission	date	date_DMY_nr	YYYY-mm-dd	date of admission
	Optional:						
optional	patient	**educ_cd**	highest completed education level	quintile or top/bottom	quintiles	integer	patient's highest completed education
	patient	**socecon_lvl_cd**	socioeconomic level	quintile or top/bottom	quintiles	integer	patient's socioeconomic level (quintile)
	patient	**country_cd**	country (residence)	ISO3166	none	string	patient's country of residence
	patient	**district_cd**	district (residence)	e.g. Eurostat NUTS			
	patient	**country_origin_cd**	country (origin)	ISO3166	none	string	patients' country of origin (country of

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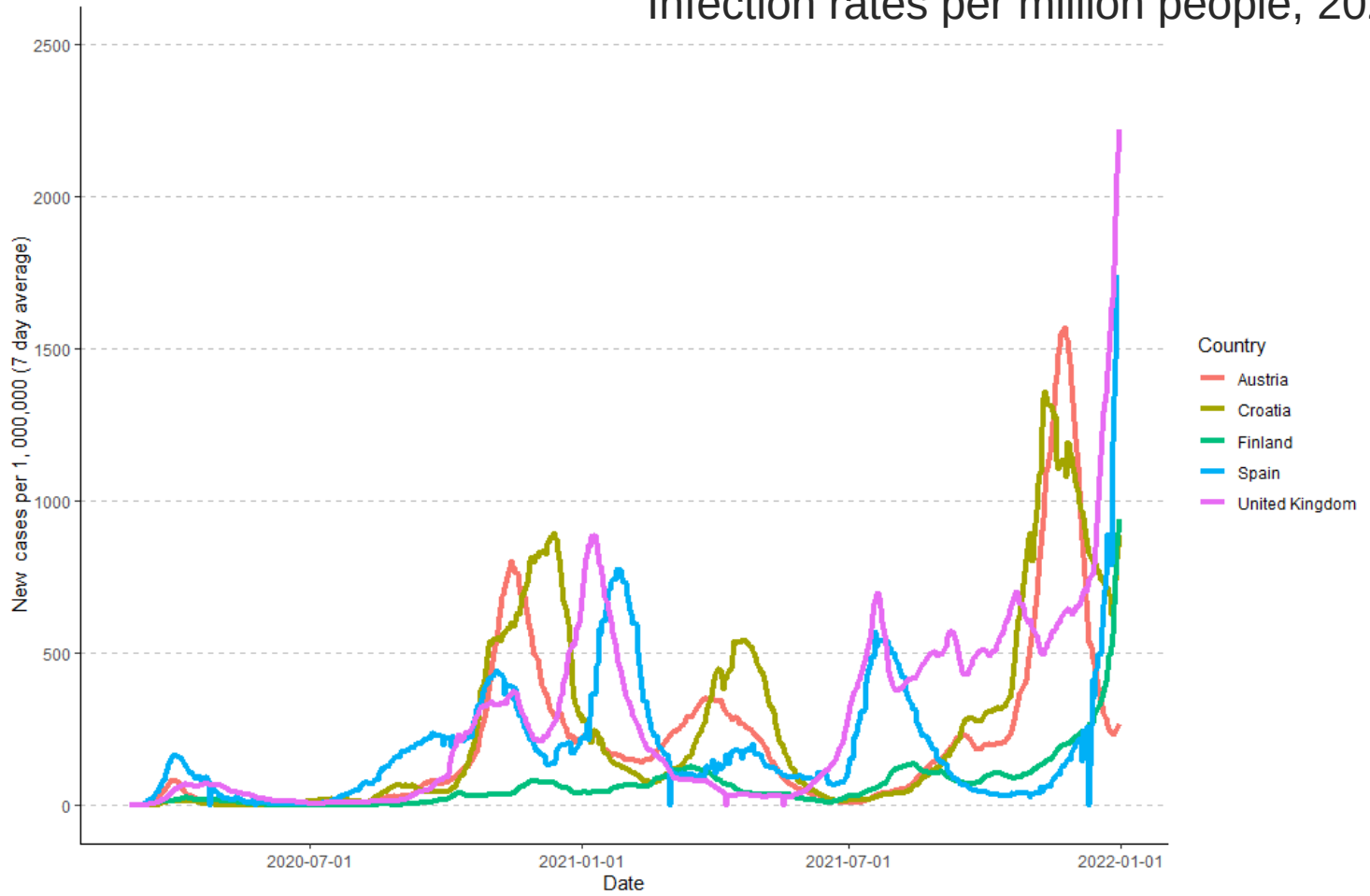
Setting the Scene:
differing timing of patterns in infection rates between countries

Infection rates per million people, 2020-2022:



Source: Our World in Data (retrieved on 5th November 2021).

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Docker output

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Use Case A: Indirect effects of COVID-19 pandemic on vulnerable populations

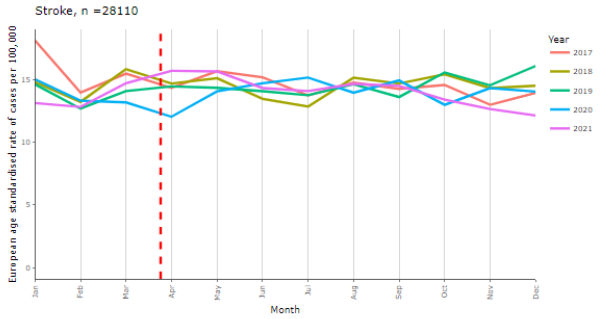
2022-07-05

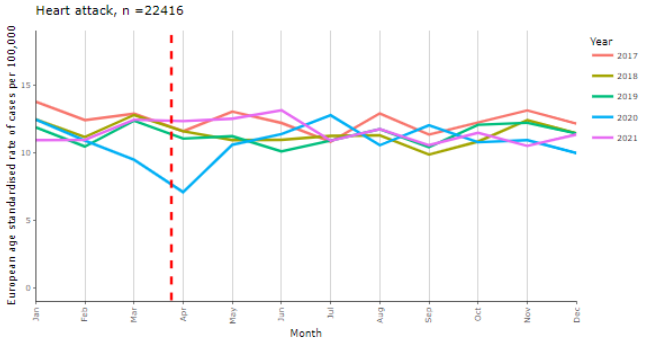
Use Case A on Vulnerable Populations

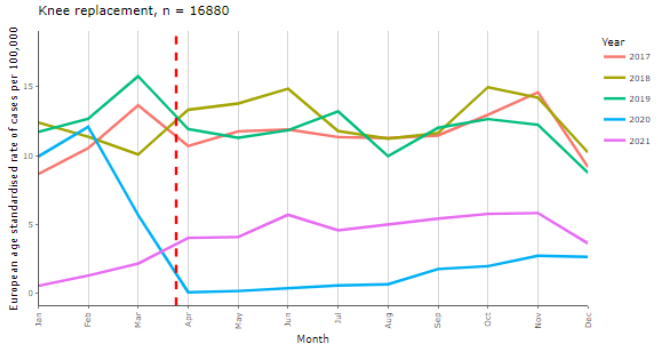
Wide variations in COVID-19 infection and outcomes exist across Europe and within countries. Use Case A explores the indirect impact of the pandemic on health care utilisation in three tracer groups of conditions - heart attack and stroke, hip and knee replacement and severe trauma. By incorporating deprivation measures, further comparisons examining differences across socioeconomic status can be investigated.

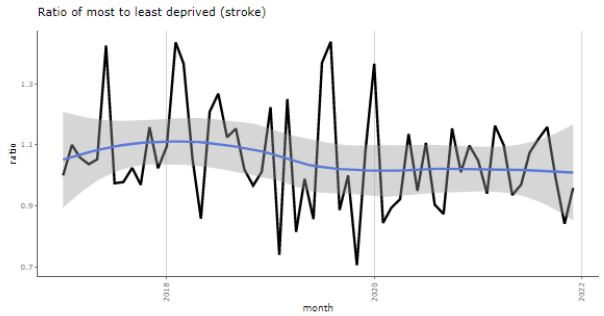
LOCAL ANALYSES

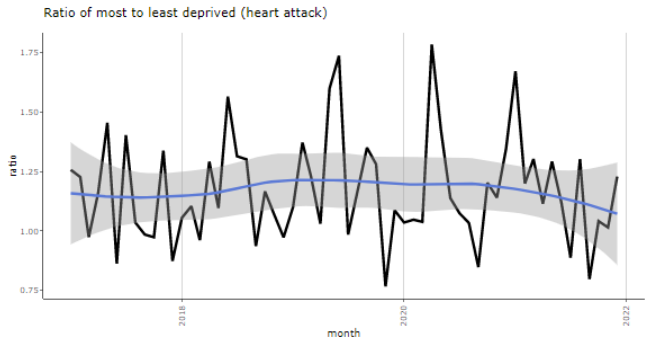
This analyses corresponds with the local part of the analysis (country-specific). Please, provide feedback on your outputs, both data quality analysis (EDA), HTML report and aggregated output to the Use Case A leaders to complete the overall analyses.

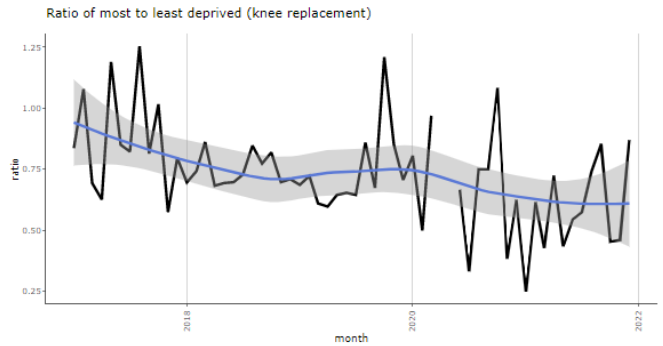












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Raw event counts

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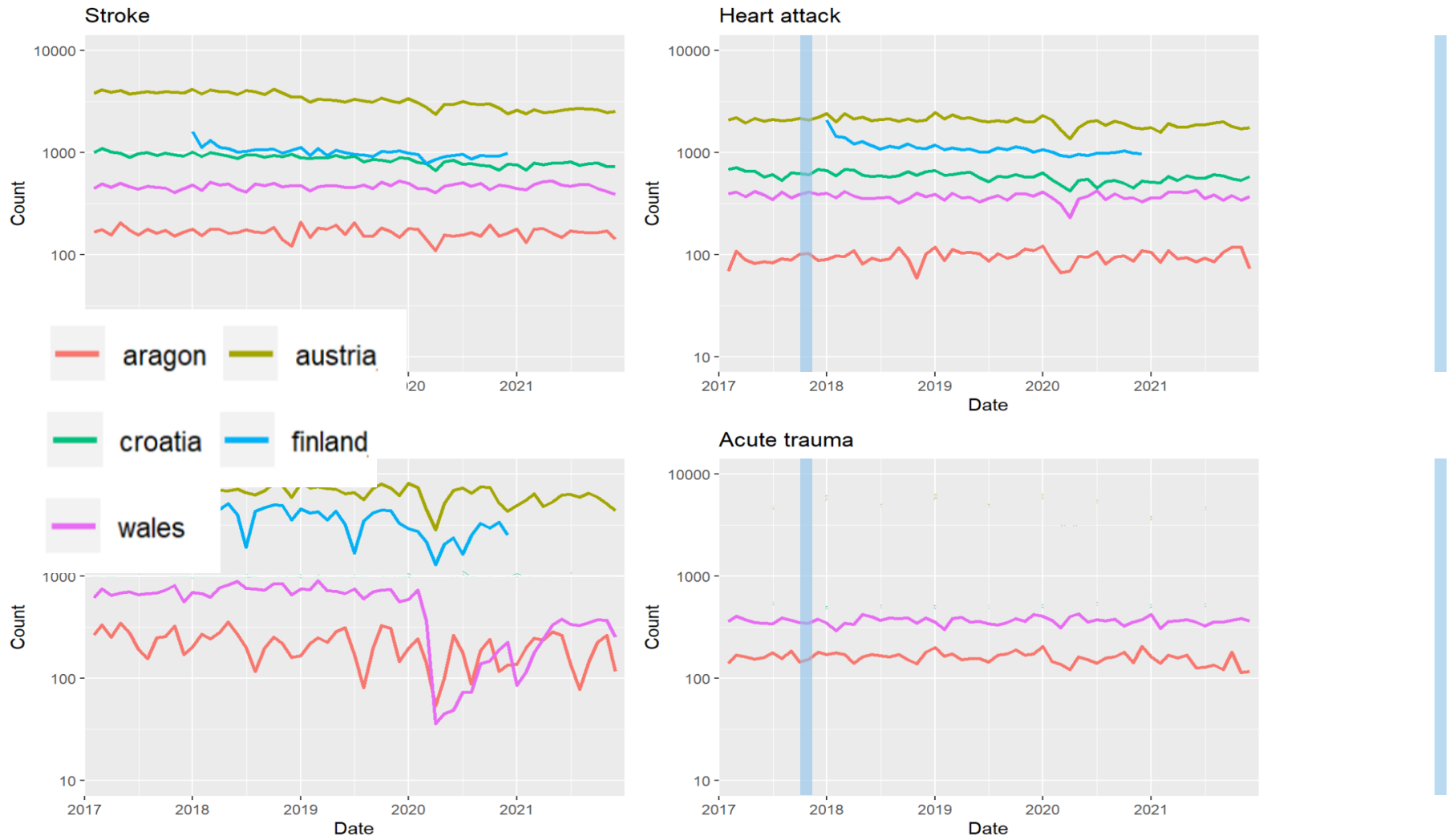
Raw event counts



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European age standardises rates:

Stroke, Heart attack, Arthroplasty and Trauma

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ARIMA forecasting from March 2020

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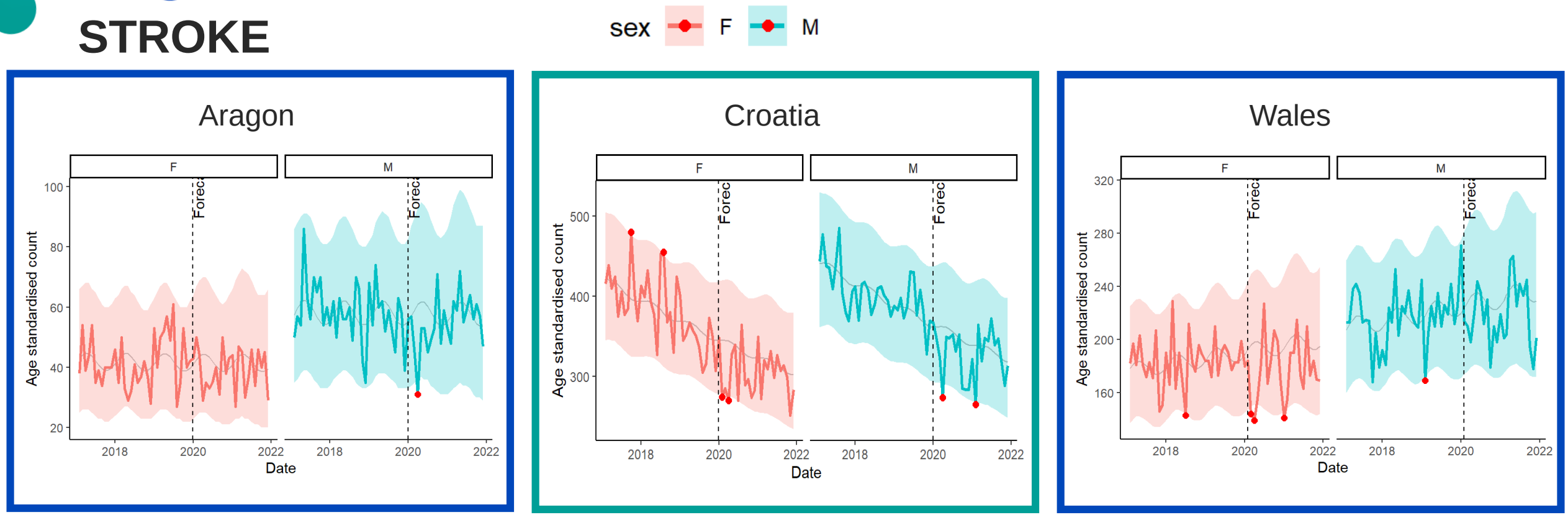
STROKE



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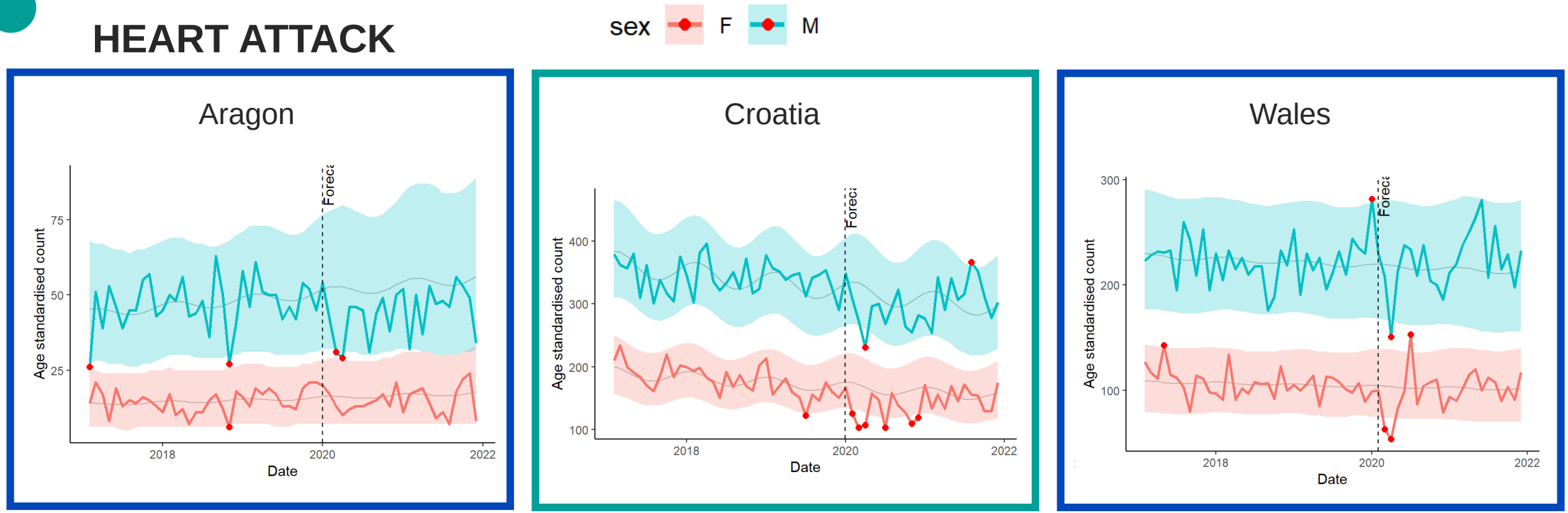
ARIMA forecasting from March 2020

HEART ATTACK



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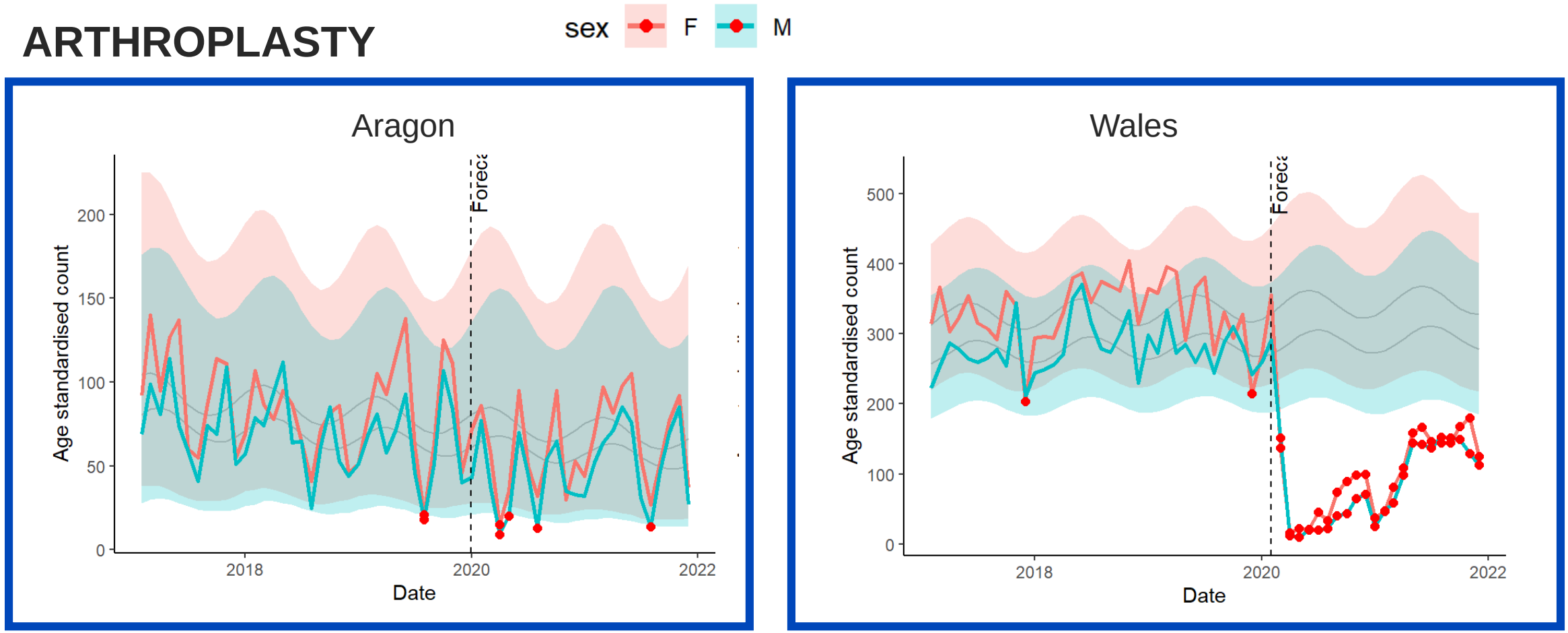
ARIMA forecasting from March 2020

ARTHROPLASTY



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ARIMA forecasting from March 2020

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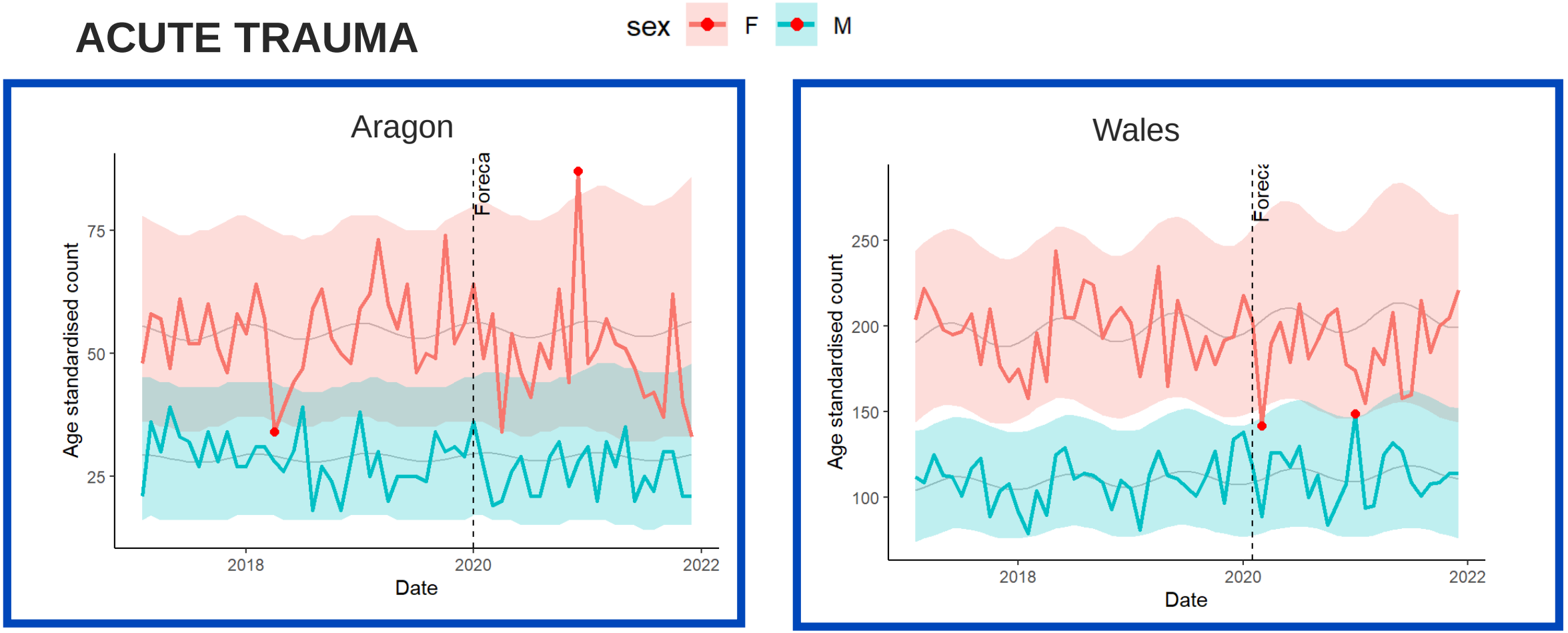
ACUTE TRAUMA



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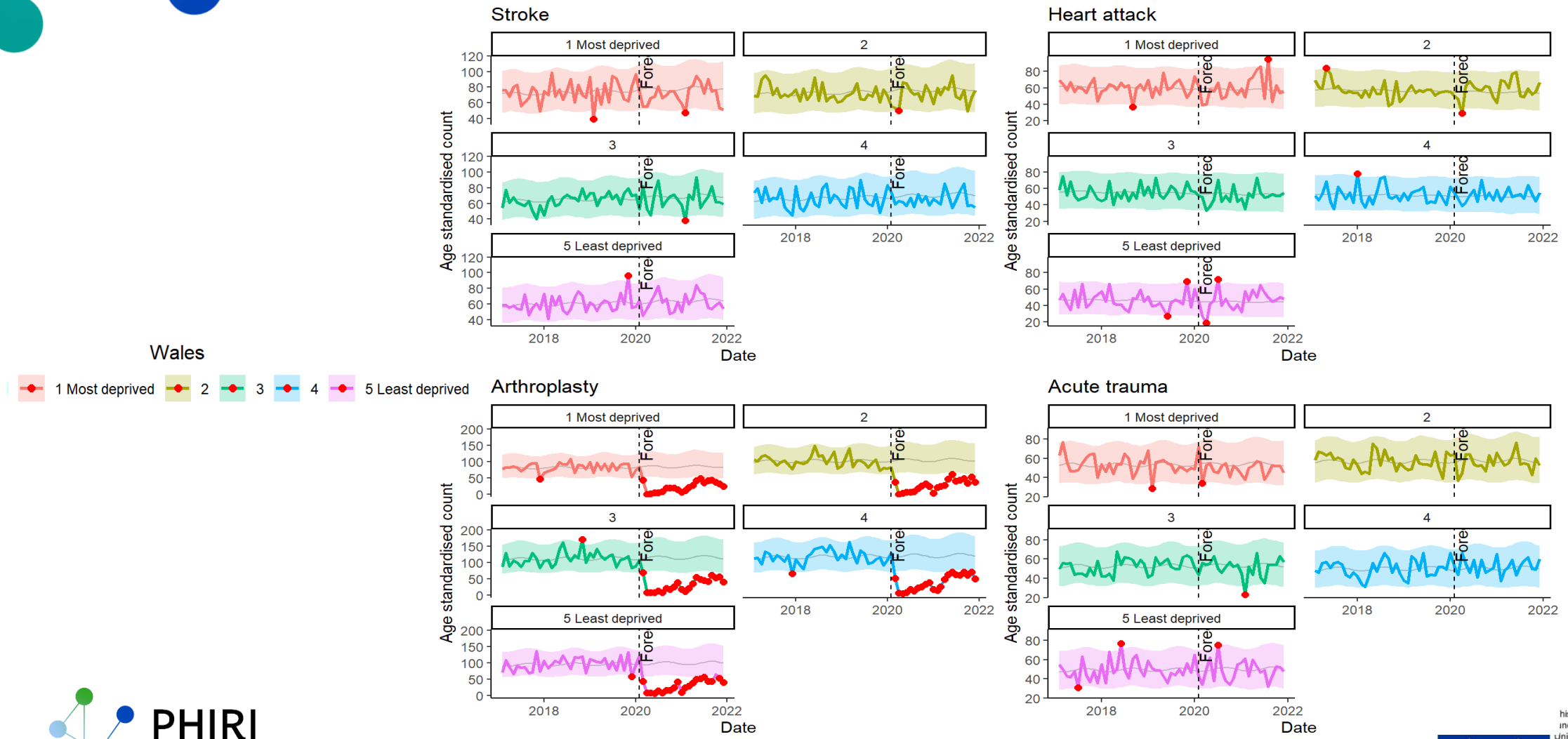

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Further work

- Unify analysis into one GLM, investigating demographic, geographic and epidemiological factors as contributors to changes in health care utilisation
- Incorporate additional countries into the model as they provide data
- Bring this data back to country specific policies and use this to identify which containment measures are most likely to associate with non-COVID health care utilization

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Thank you for your attention!

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/company/phiri

ROBERT KOCH INSTITUT

Swansea University Prifysgol Abertawe

Gesundheit Österreich GmbH

IACS Instituto Aragonés de Ciencias de la Salud

Instituto de Salud Carlos III

SAIL DATABANK

Finnish institute for health and welfare

Karolinska Institutet

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Was there any *delay* in breast cancer treatment because of the COVID-19 stringency measures?

Francisco Estupiñán-Romero

on behalf of PHIRI Use Case B participants

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Study design

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Design: Observational retrospective quasi-experimental pre-post international comparison using a ***federated analysis approach***

Cohort: All women over 18 years old with a diagnosis of breast cancer that received hospital treatment (*i.e. surgery, radiotherapy, chemotherapy, hormonal therapy or immunotherapy*) from *Jan-2017 to Dec-2021* in each country/region

Outcome: Time from breast cancer diagnosis to first treatment

Country/region participation (N=5): Aragon (AR, Spain), Wales (WA, United Kingdom), Belgium (BE), Marche (MA, Italy), and Latvia* (LV)

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Methods

- ***Local analysis:***
  - Distribution of interval times from breast cancer diagnosis to first hospital treatment by treatment type
- ***Comparative analysis on local aggregated outputs:***
  - Comparative analysis of direct standardize rates of hospital treatment
  - Structural empirical breakpoint analysis of time-to-first-treatment trend by region/country
  - Time series analysis of time-to-first-treatment before March 2020 with forecasting after March 2020
  - Segmented regression modelling (*March 2020*) considering contextual factors (*i.e. epidemiological data, health system capacity and public health stringency measures*)
  - Sensitivity analyses

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Breast cancer treatment delay: From Diagnosis to FIRST treatment

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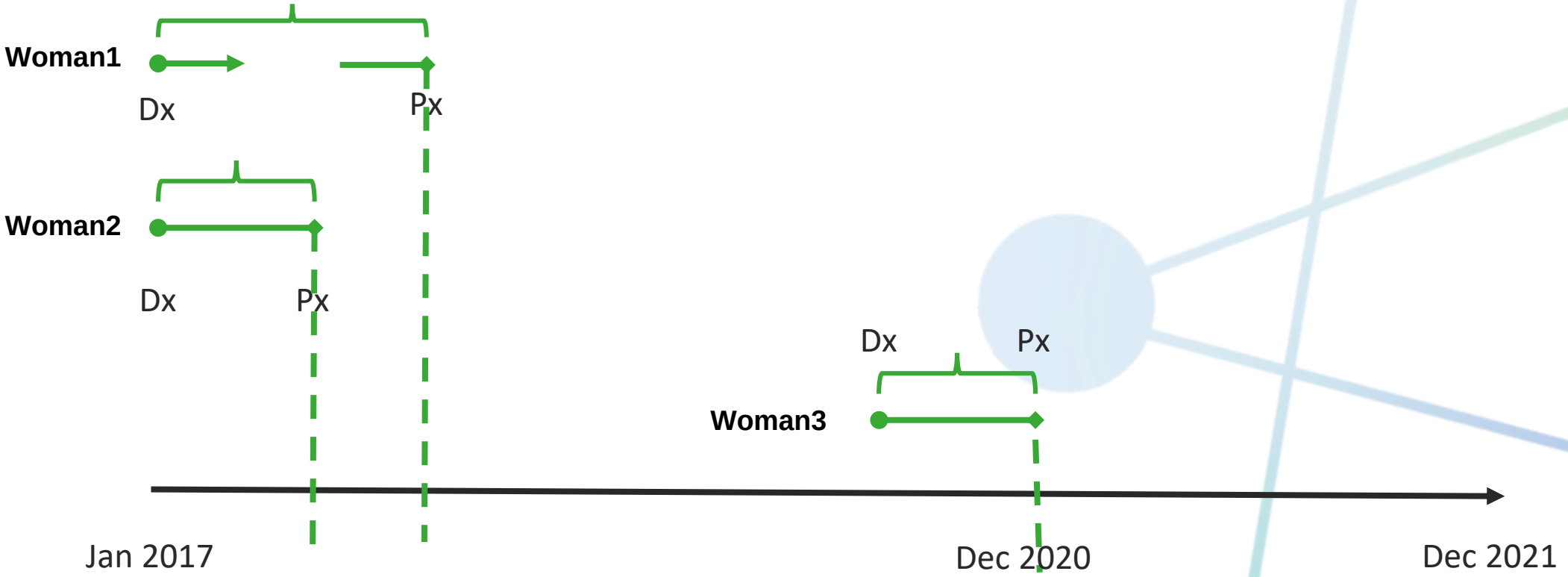

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Results

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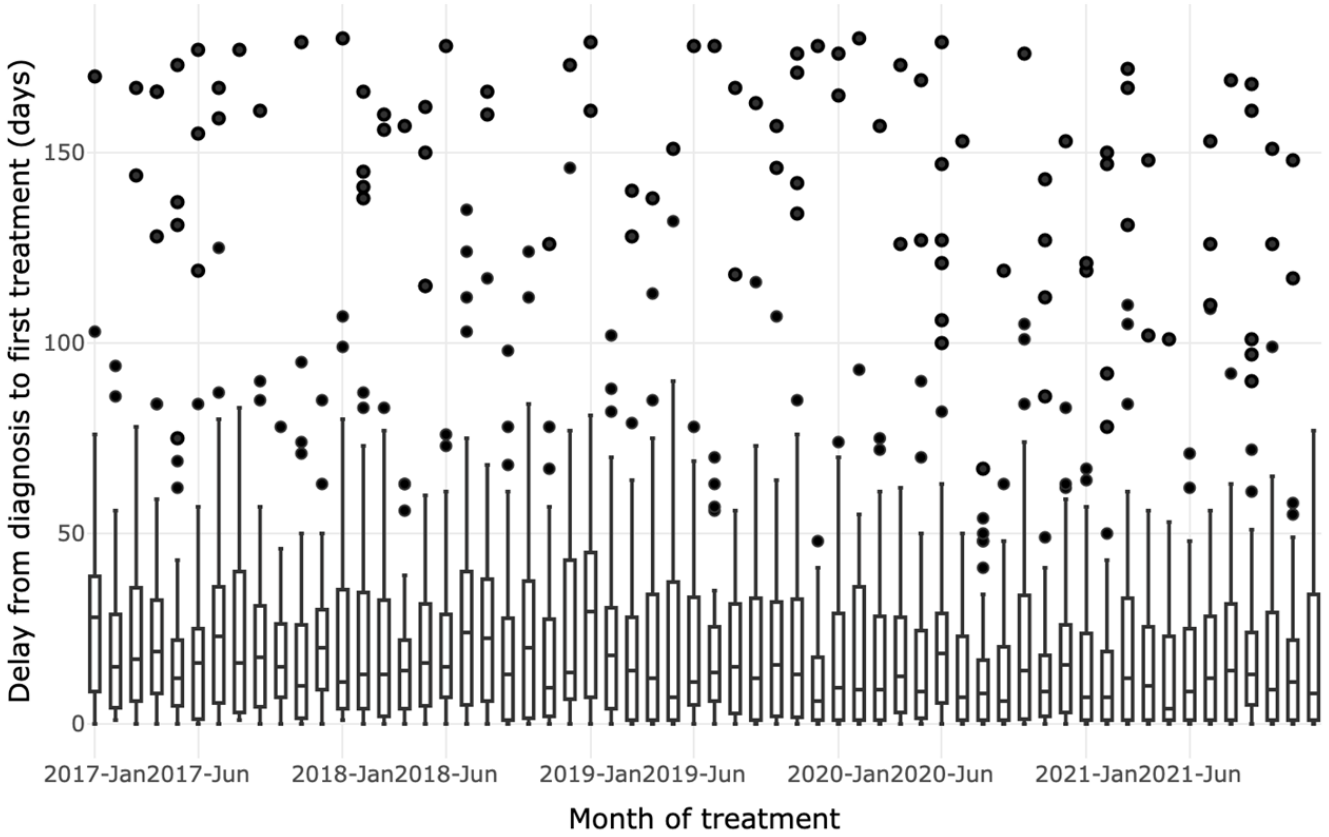
Distribution of times from diagnosis to treatment for breast cancer patients

Monthly interval distribution from diagnosis to surgery (boxplots)



ARAGON (SPAIN)

DOI 10.5281/zenodo.6724454

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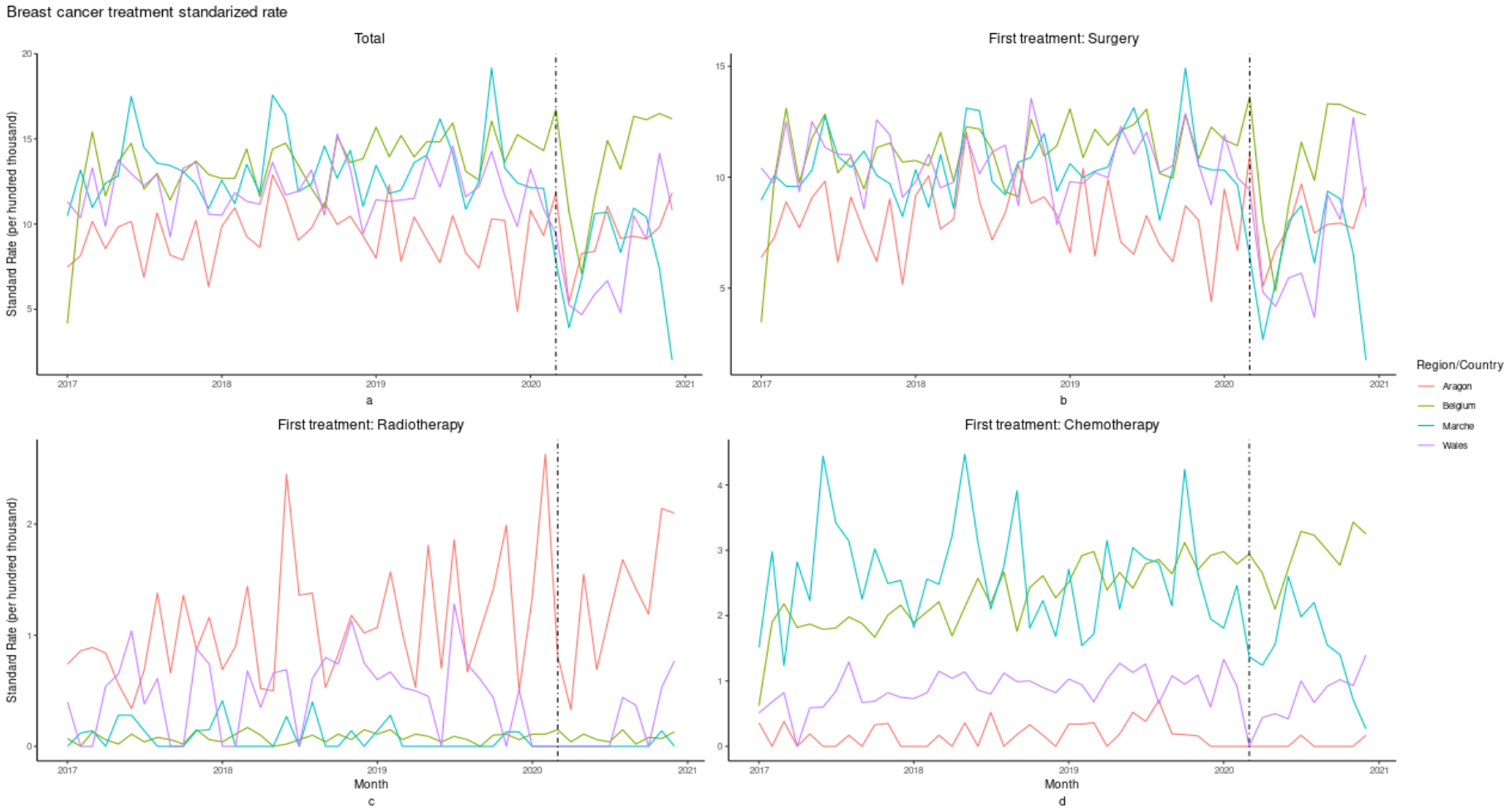
Direct standardized rates of treatment for breast cancer by treatment type and region/country



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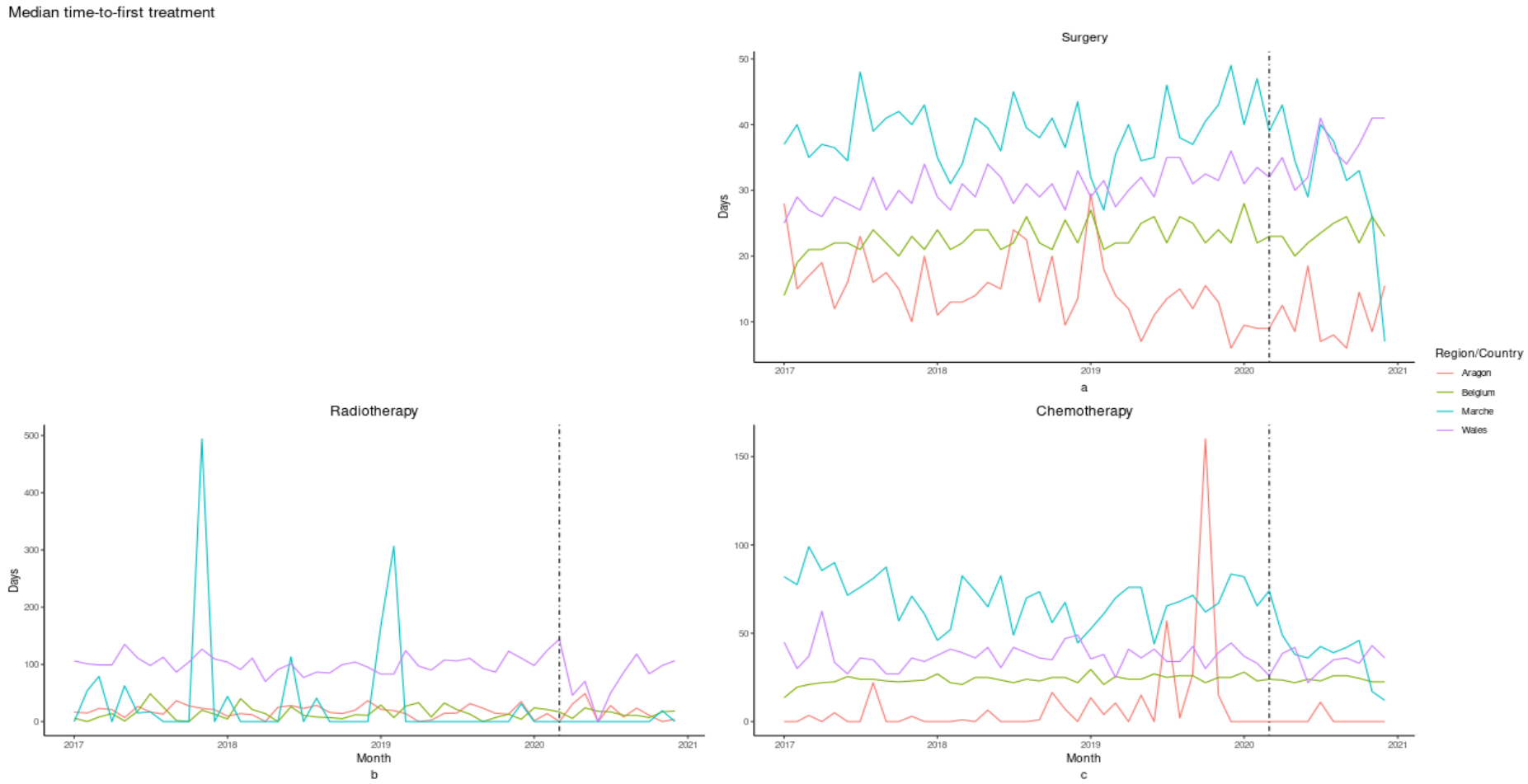
Median time-to-first-treatment by region/country (trend)



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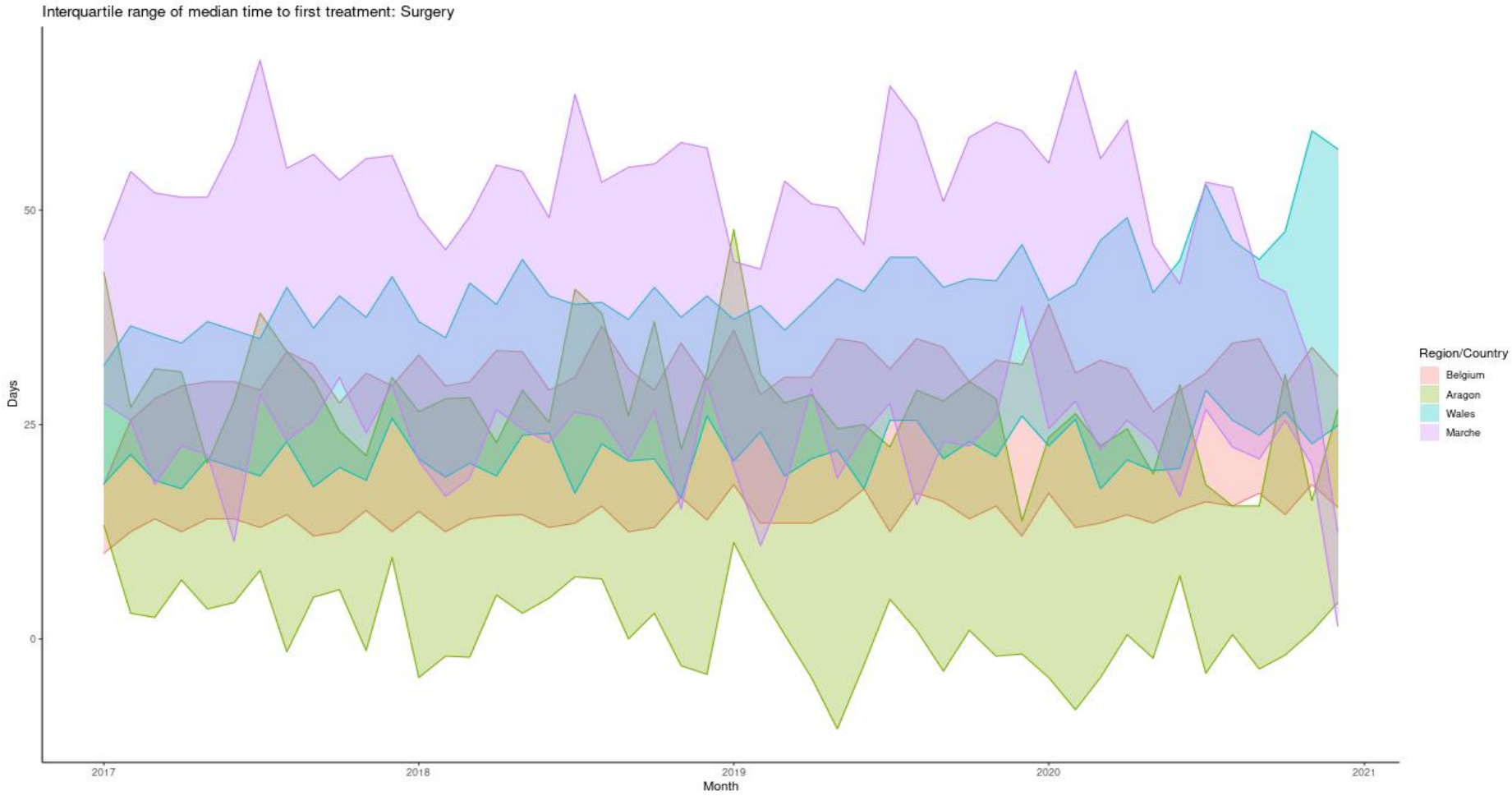
IQR time-to-first-treatment (surgery) by region/country



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Structural break point analysis of the destationalised trend of median time-to-first-treatment (surgery)

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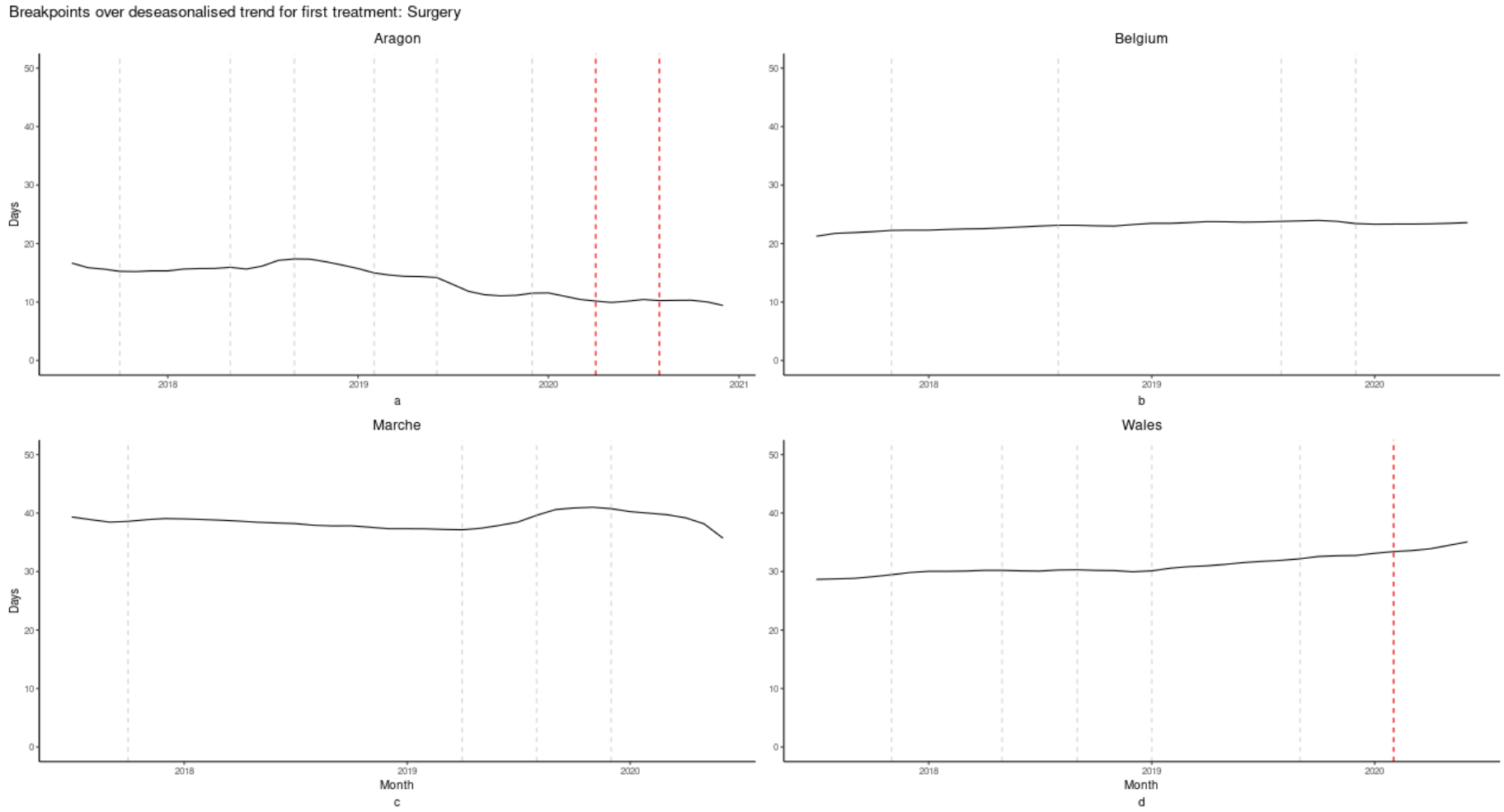

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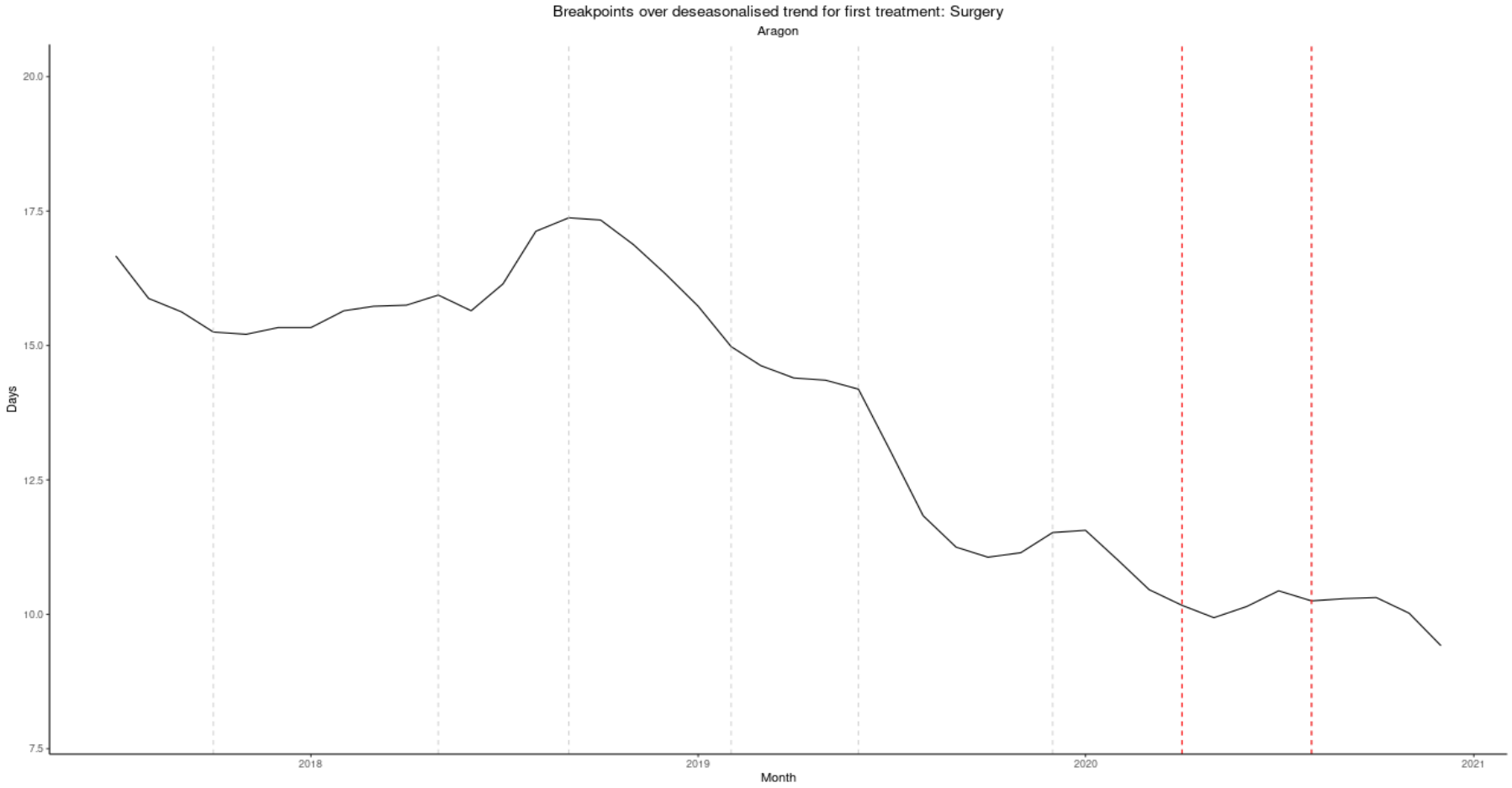

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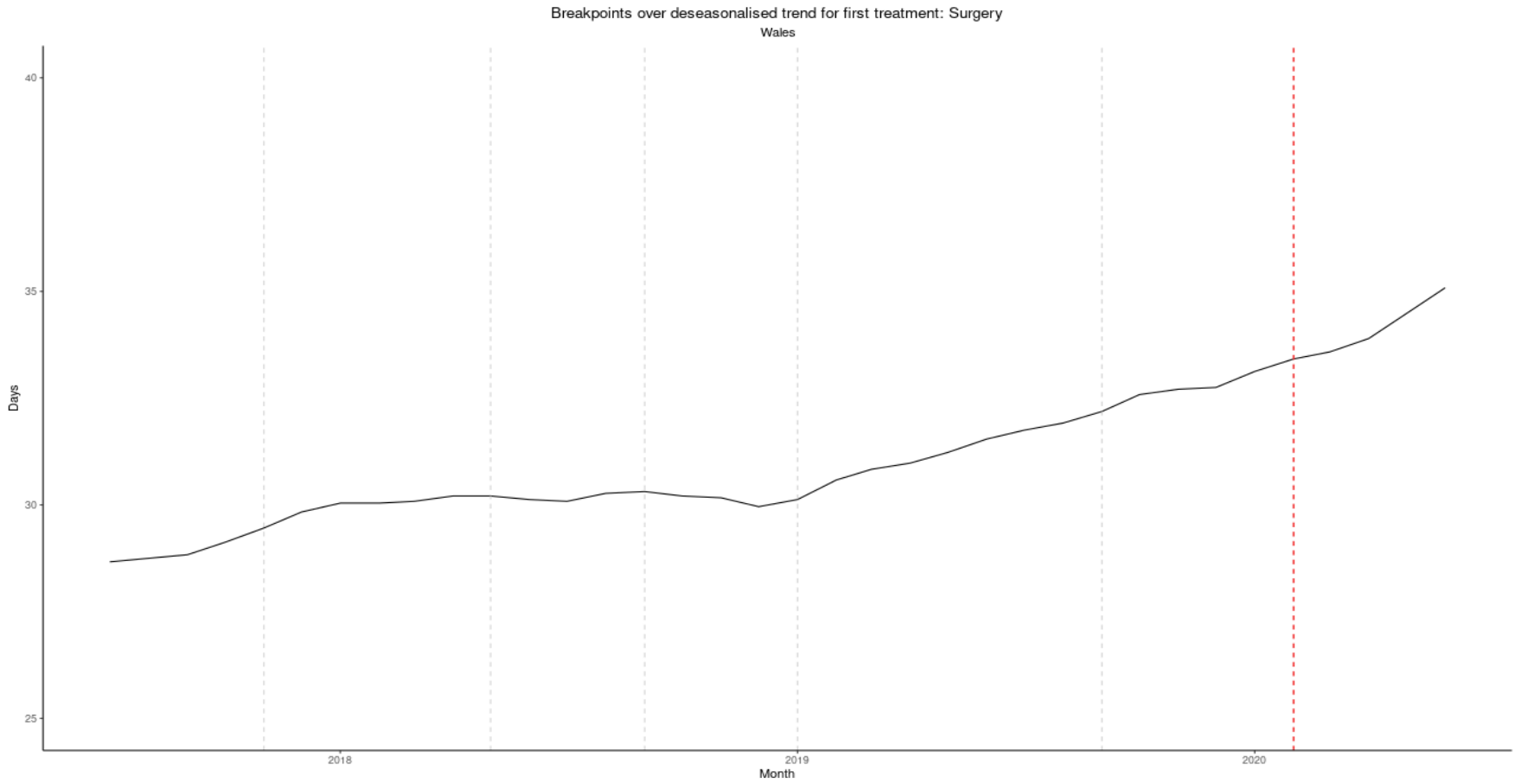
Structural break point analysis of the destationalised trend of median time-to-first-treatment (surgery)



WALES (UK)

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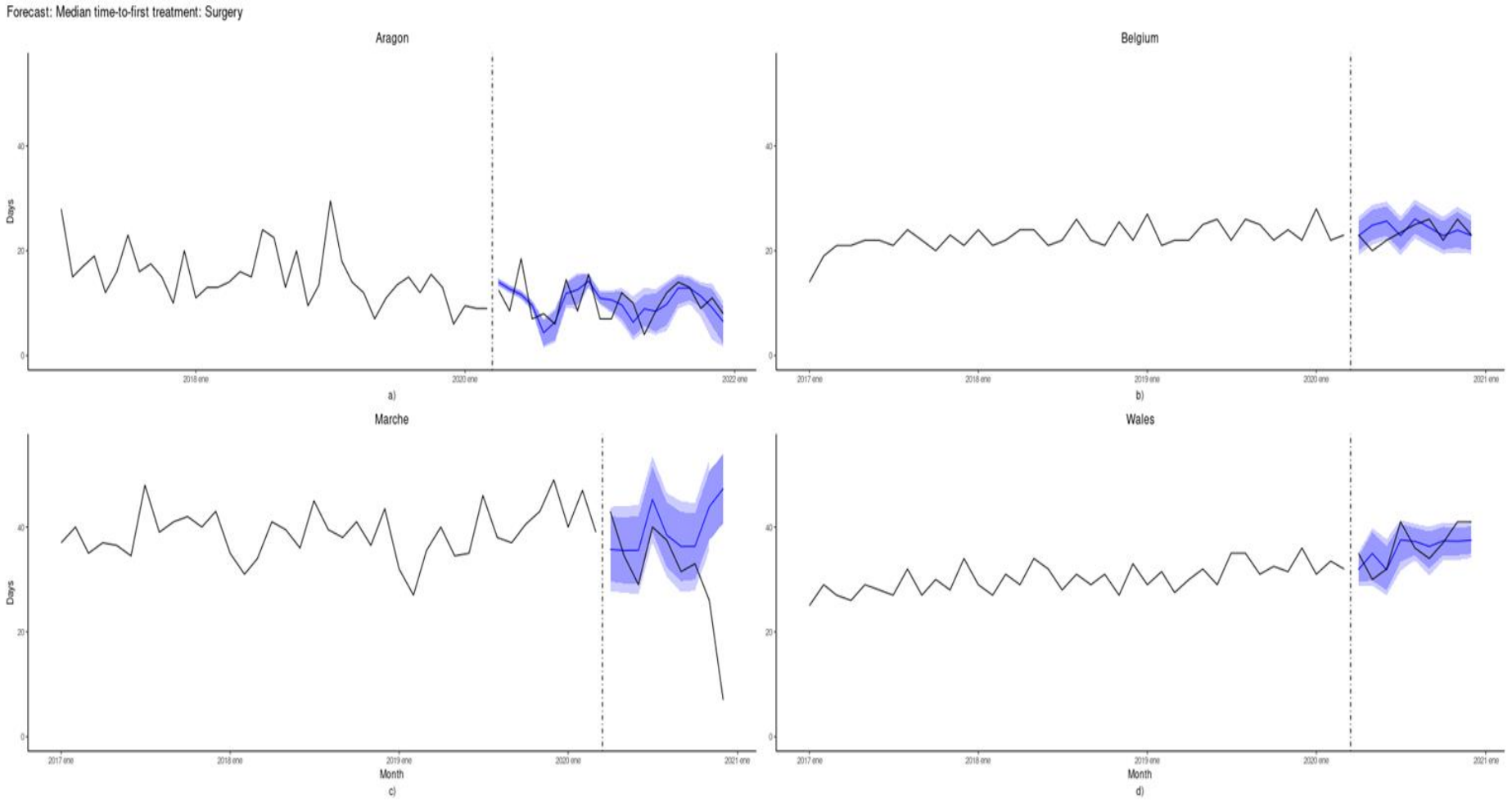
Time series analysis and forecast from March 2020 onwards



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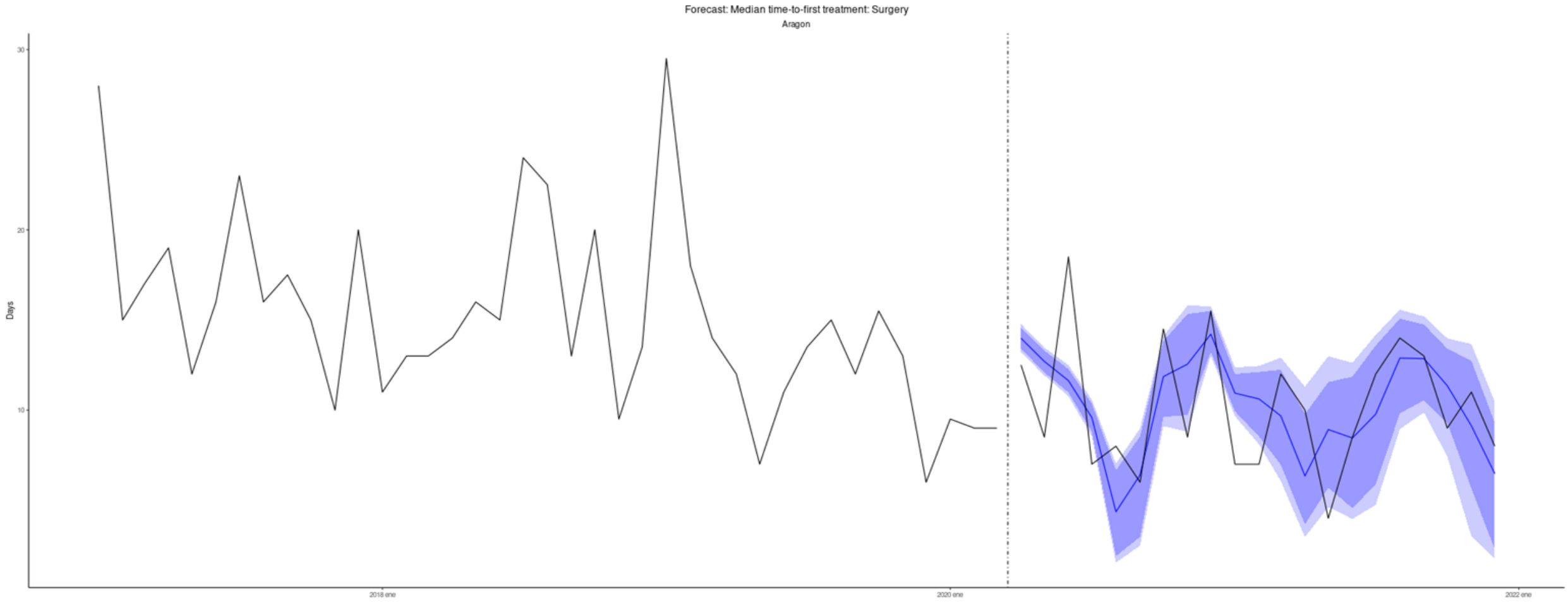

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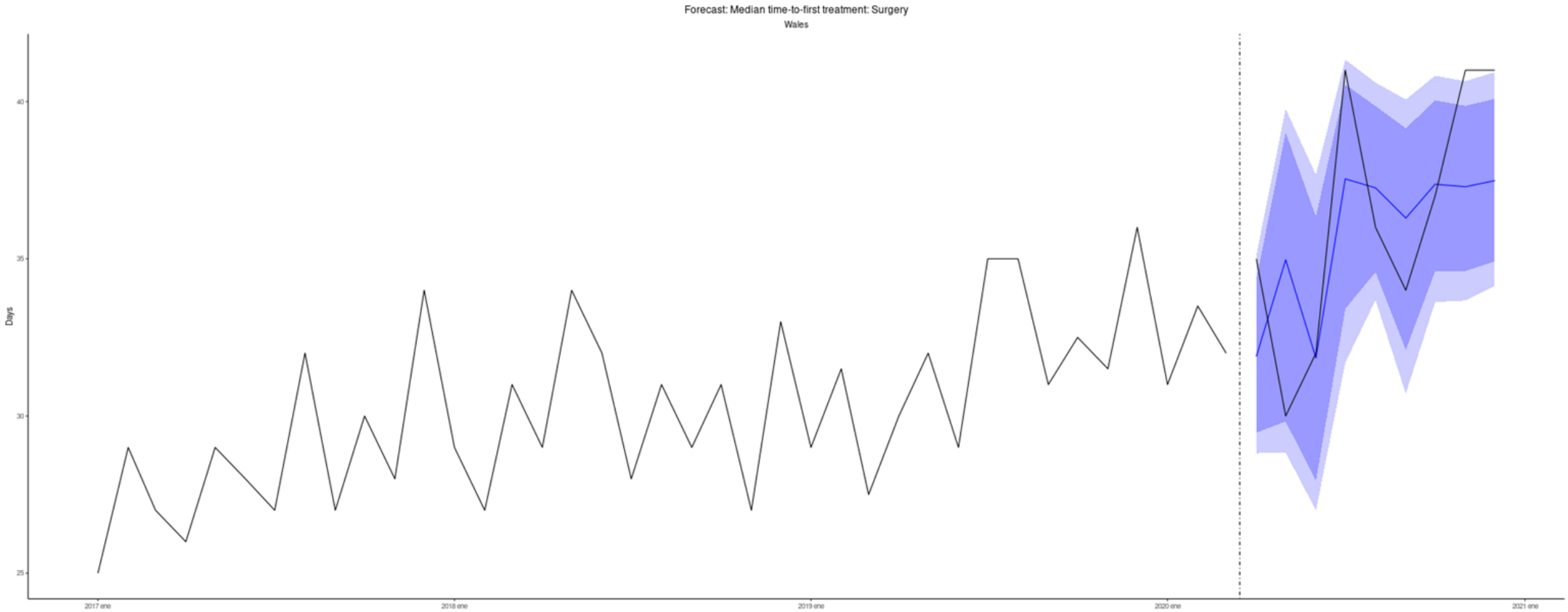

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Interrupted time series analysis considering contextual factors - March 2020 onwards- (Aragon | All regions)


```
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: Gamma  ( log )
Formula: median_time_to_surgery ~ period + moda_stringency_index + median_hosp_admissions_per_1E5 +      (1 | i)
   Data: data_regressionAR

     AIC      BIC   logLik deviance df.resid
   349.5    362.1   -168.8    337.5       54

Scaled residuals:
    Min      1Q  Median      3Q     Max
-1.8299 -0.6617 -0.2340  0.5821  3.2664

Random effects:
 Groups   Name        Variance Std.Dev.
 i        (Intercept) 0.0000   0.0000
 Residual             0.1028   0.3206
Number of obs: 60, groups:  i, 2

Fixed effects:
                               Estimate Std. Error t value Pr(>|z|)
(Intercept)                    2.913077   0.090727  32.108   <2e-16 ***
period                        -0.009807   0.003704  -2.648   0.0081 **
moda_stringency_index         -0.001349   0.002388  -0.565   0.5722
median_hosp_admissions_per_1E5 -0.004280   0.007790  -0.549   0.5827
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr) period md_st_
period      -0.829
md_strngnc_  0.335 -0.631
mdn_h___1E5  0.099 -0.121 -0.456
optimizer (Nelder_Mead) convergence code: 0 (OK)
boundary (singular) fit: see help('isSingular')
```

```
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: Gamma  ( log )
Formula: median_time_to_surgery ~ Region + (Region | i)
   Data: data_regressionALL

     AIC      BIC   logLik deviance df.resid
  1285.6   1335.3   -627.8   1255.6      189

Scaled residuals:
    Min      1Q  Median      3Q     Max
-3.5434 -0.4138 -0.0669  0.3832  4.5390

Random effects:
 Groups   Name          Variance Std.Dev. Corr
 i        (Intercept)   0.008399 0.09164
          RegionBelgium 0.009899 0.09949  -1.00
          RegionMarche  0.001599 0.03999  -1.00  1.00
          RegionWales   0.018213 0.13496  -1.00  1.00  1.00
 Residual               0.048470 0.22016
Number of obs: 204, groups:  i, 2

Fixed effects:
             Estimate Std. Error t value Pr(>|z|)
(Intercept)    2.49128    0.16991  14.662  < 2e-16 ***
RegionBelgium  0.64561    0.18950   3.407 0.000657 ***
RegionMarche   1.04655    0.09124  11.471  < 2e-16 ***
RegionWales    1.02097    0.25222   4.048 5.17e-05 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr) RgnBlg RgnMrc
RegionBelgm -0.971
RegionMarch -0.845  0.818
RegionWales -0.982  0.954  0.818
optimizer (Nelder_Mead) convergence code: 0 (OK)
Model failed to converge with max|grad| = 0.112076 (tol = 0.002, component 1)
```

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Interrupted time series analysis considering contextual factors - March 2020 onwards- (Aragon | All regions)

	Name	Model	AIC	AIC_wt	BIC	BIC_wt	RMSE	Sigma	AICc	AICc_wt	R2_conditional	R2_marginal	ICC	R2_Nagelkerke
1	model1ALL	glm	1303.884	7.338673e-05	1320.474	9.993639e-01	4.809907	0.2534666	NA	NA	NA	NA	NA	0.7314282
2	model2ALL	glmerMod	1285.585	6.903376e-01	1335.357	5.860863e-04	4.270617	0.2200435	1288.139	NA	0.8023367	0.7877803	0.0685913	NA
3	model3ALL	glmerMod	1287.189	3.095891e-01	1340.279	5.002246e-05	4.313918	0.2198807	1290.098	NA	0.8068935	0.7931191	0.0665813	NA

- Model1 ALL: *glm(median_time_to_surgery ~ region)*
- Model2ALL: *glme(median_time_to_surgery ~ region + (region | i))*
- Model3ALL: *glmer(median_time_to_surgery ~ region + period + (region | i))*

i = binary variable considering before/after March 2020
period = months [1, 48]

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Challenges

- ***Local analysis:***
  - Data availability and quality issues in the case of Latvia
  - Lack of availability of socioeconomic status for most participants

- ***Comparative analysis on local aggregated outputs:***
  - Some restrictive aggregation decisions on local analysis output may limit the scope of comparative analysis
  - Lack of availability or difficulty to access reliable international data on healthcare reorganization apart from qualitative information

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Some lessons learned

- We can observe an acute decrease in treatments just after March 2020 in all country/regions
- There are changes in the destationalised trend of time-to-first-treatment (surgery) in relation with the surge of COVID-19 cases in March 2020 in some of the participating regions/countries
- Those changes are statistically significant in the case of Aragon (Spain) and Wales (UK), although not clinically relevant and seemingly part of a broader trend
- Changes are significantly different depending on the region/country (both in magnitude and direction)
- Changes seemed not to be associated with the epidemiological factors, nor other factors measured monthly at region/country level

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Thank you!

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/company/phiri

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USE CASE C
Indirect effets of the COVID-19 pandemic on perinatal health

Jennifer Zeitlin for the
Euro-Peristat Network

Université Paris Cité

Inserm

EURO PERISTAT

COVID-19 and perinatal health

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- Pregnant women and newborns are vulnerable populations
  - ➢ *Direct effects – linked to infection by COVID-19*
    - Specificities of their immune systems
    - maternal-fetal transmission (fetal development/newborn health)
  - ➢ *Indirect effects – disruptions associated with the pandemic and its mitigation measures*

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Indirect effects: two main pathways

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Disrupted maternity care

- Reluctance to go to the hospital or to ask women to come into hospital → delayed responses to danger signs.
- Use of telemedicine or other changes in care provision
- Transmission reduction measures (maternal-baby separation, caesarean, restricted breastfeeding) → adverse psychosocial and health consequences

Changes to wellbeing, lifestyle and environment

- Increased stress, anxiety, depression
- Economic hardship,
- Lifestyle changes (activity, diet
- Environment (air pollution)

➢ **Describing these effects is essential for shaping and evaluating pandemic strategies now and for the future**

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Indirect effects: a population approach is essential

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- Pregnant women and newborns are generally in good health → require large population-based samples.
- Must consider seasonal effects and secular trends
- Comprehensive coverage including disadvantaged populations

➢ ***Perinatal outcomes are sensitive to changes in socioeconomic circumstances and social disadvantage***

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Unexpected decrease in preterm birth rates ?

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- Due to fewer indicated preterm births ?
- Due to positive effects of the lockdowns (less physical activity, pollution?)

Did Lockdowns Lower Premature Births? A New Study Adds Evidence

Dutch researchers say the "impact was real," adding to hopes that doctors will learn more about factors contributing to preterm birth.

A preterm newborn was wheeled to meet his mother in a hospital in Istanbul. A large study of babies born in the Netherlands links the lockdowns with fewer preterm births. Chris Mcgrath/Getty Images

Confinement : les naissances prématurées en baisse

Le Covid-19 aura au moins eu une conséquence heureuse. Le nombre de naissances prématurées est en sensible baisse dans plusieurs départements. Le calme des deux confinements successifs s'avère très positif pour les femmes enceintes et leurs enfants.

LES AUTRES JT DE FRANCE 3

19/20 Soir/3

LES TITRES

Covid-19 : la France suspend aussi les injections du vaccin AstraZeneca "jusqu'à demain après-midi", dans l'attente de l'avis de l'Agence européenne des médicaments

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INFO

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Société

Corona Baby : jusqu'à 80% de bébés prématurés en moins, le mystère du confinement

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Objective

Investigate the indirect impact of the COVID-19 pandemic in 2020 on perinatal health in Europe using population-based national data

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Key perinatal health indicators

Stillbirth (baby born without signs of life)

- 3-4 per 1000 births (15-18,000 babies per year in Europe)
- High health and psychological burden for parents, costs for families and society

Preterm birth (birth before 37 weeks of gestation)

- Affects about 350,000 births per year in Europe, few effective prevention strategies
- Principal cause of infant death
- Long-term neurodevelopment impairment and other health problems among survivors

➢ ***Consequences are lifelong and perpetuate health inequalities***

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The EURO-PERISTAT network

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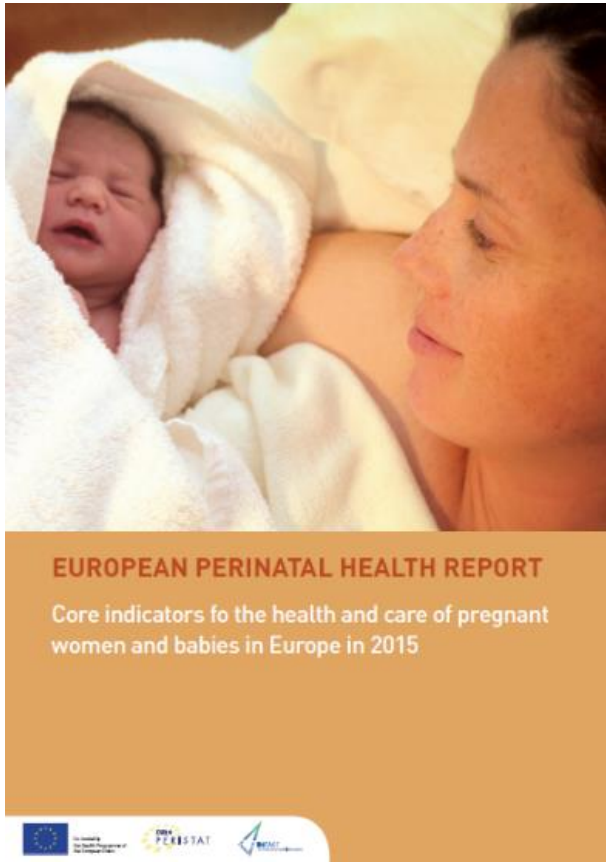
- Aim : to monitor and evaluate perinatal health in Europe based on valid and reliable indicators
- Health Monitoring Programme in 2000
- Routine national statistics
- Data collected using a common protocol
- 3 European reports, scientific publications
- 31 participating countries



EURO PERISTAT

www.europeristat.com

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Methods: Common data model

- Based on the Euro-Peristat indicators and a consensus process
- 22 variables to produce the core indicators and for the PHIRI use case
- Health indicators collected by year and by month
- Population: all live births and stillbirths with a gestational age ≥ 22 weeks of gestation
- Study period: 2015 to 2020

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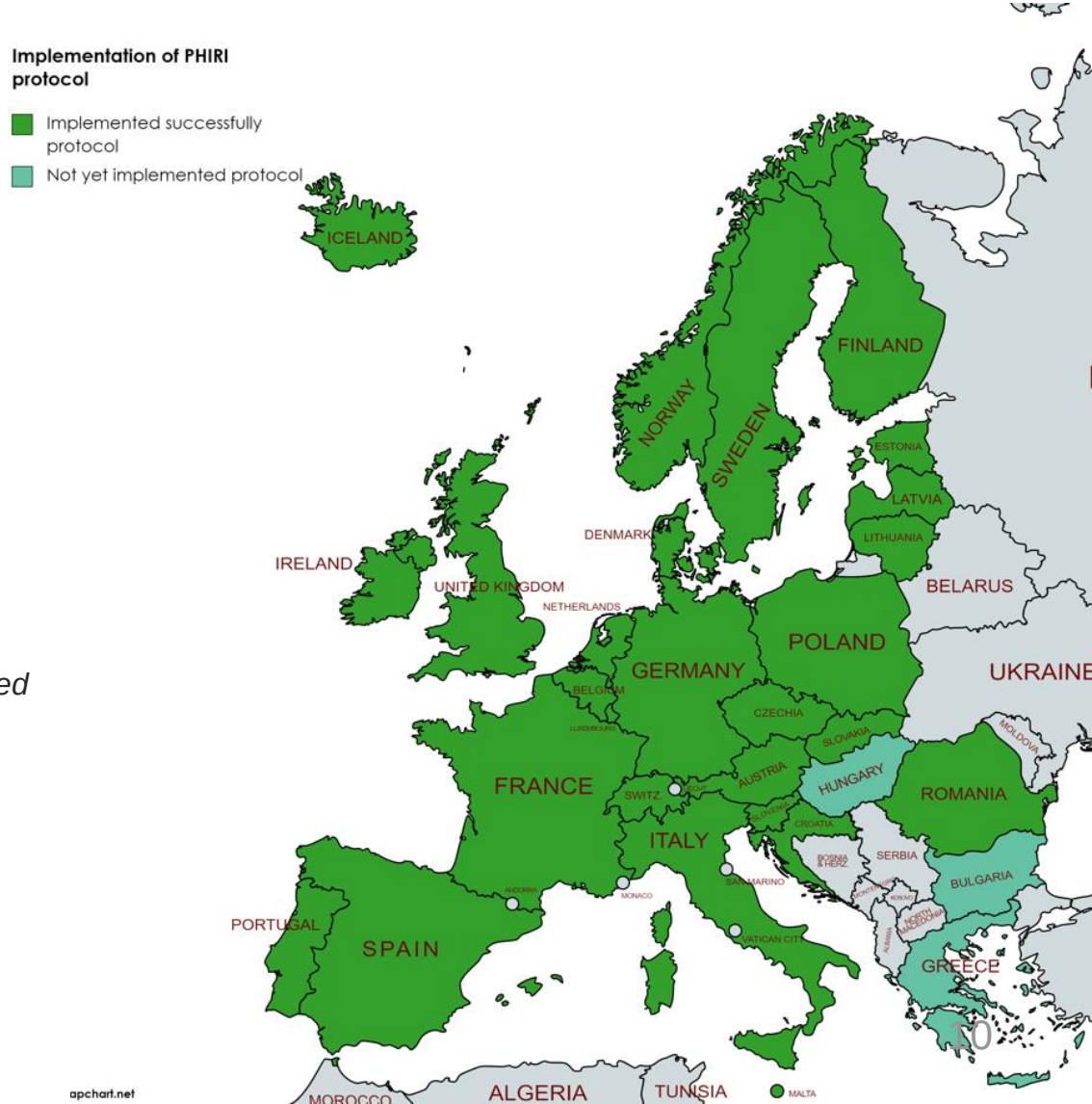
Methods: Participating countries

- 28 countries

  Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, *Romania*,* UK (MBRRACE, and UK nations constituents: England and Wales, Northern Ireland, Scotland, Wales)

  ** Recently added*

- >27 million total births,1.9M preterm births,15K stillbirths, 10K neonatal deaths



Methods: Analysis strategy

- Describe perinatal health trends in 5 years preceding the pandemic
- What “should” have happened as opposed to what “did” happen.
- Estimate relative risk of observed to expected outcome
- Linear models comparing 2020 and the period March-September
- AutoRegressive Integrated Moving Average (ARIMA) models in each country to confirm linear trends and do more detailed country analyses
- Analyse country-level estimates using random-effects meta-analysis (DerSimonian and Laird method)

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Results

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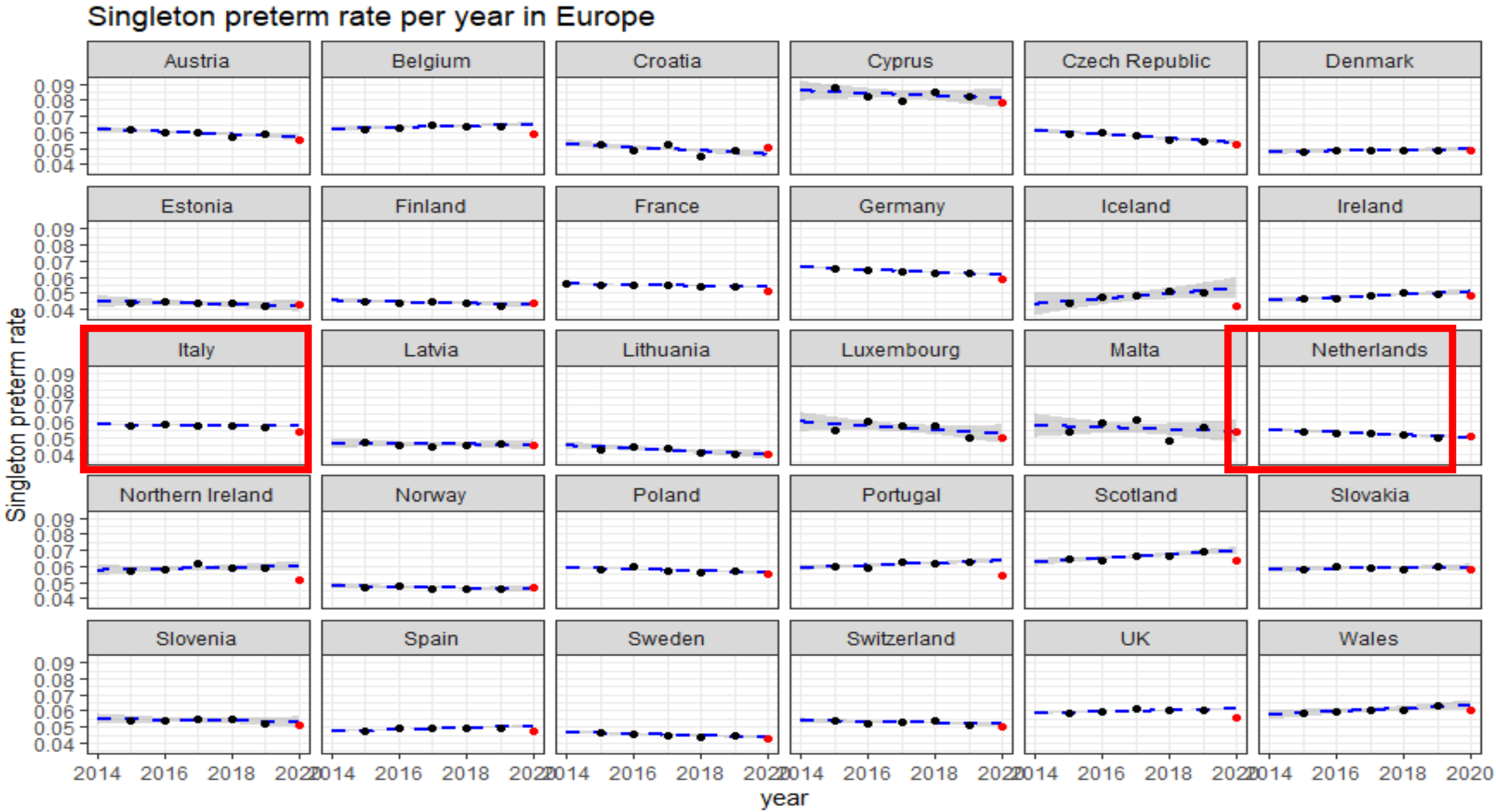
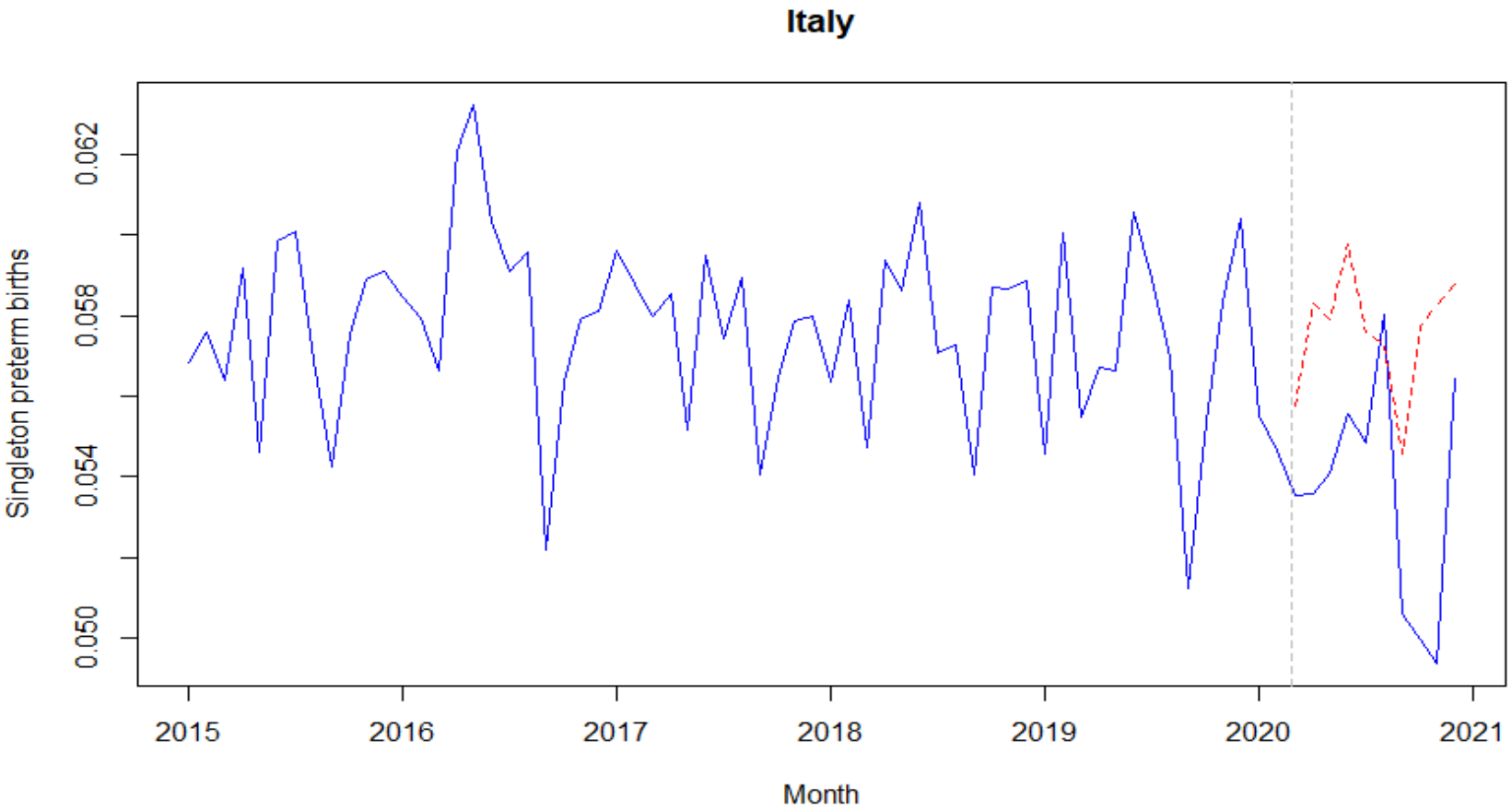

Singleton preterm rate per year in Europe
Austria
Belgium
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Iceland
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands
Northern Ireland
Norway
Poland
Portugal
Scotland
Slovakia
Slovenia
Spain
Sweden
Switzerland
UK
Wales
Singleton preterm rate
0.09
0.08
0.07
0.06
0.05
0.04
2014
2016
2018
2020
year

Time series (ARIMA*) models using monthly data



* Autoregressive integrated moving average

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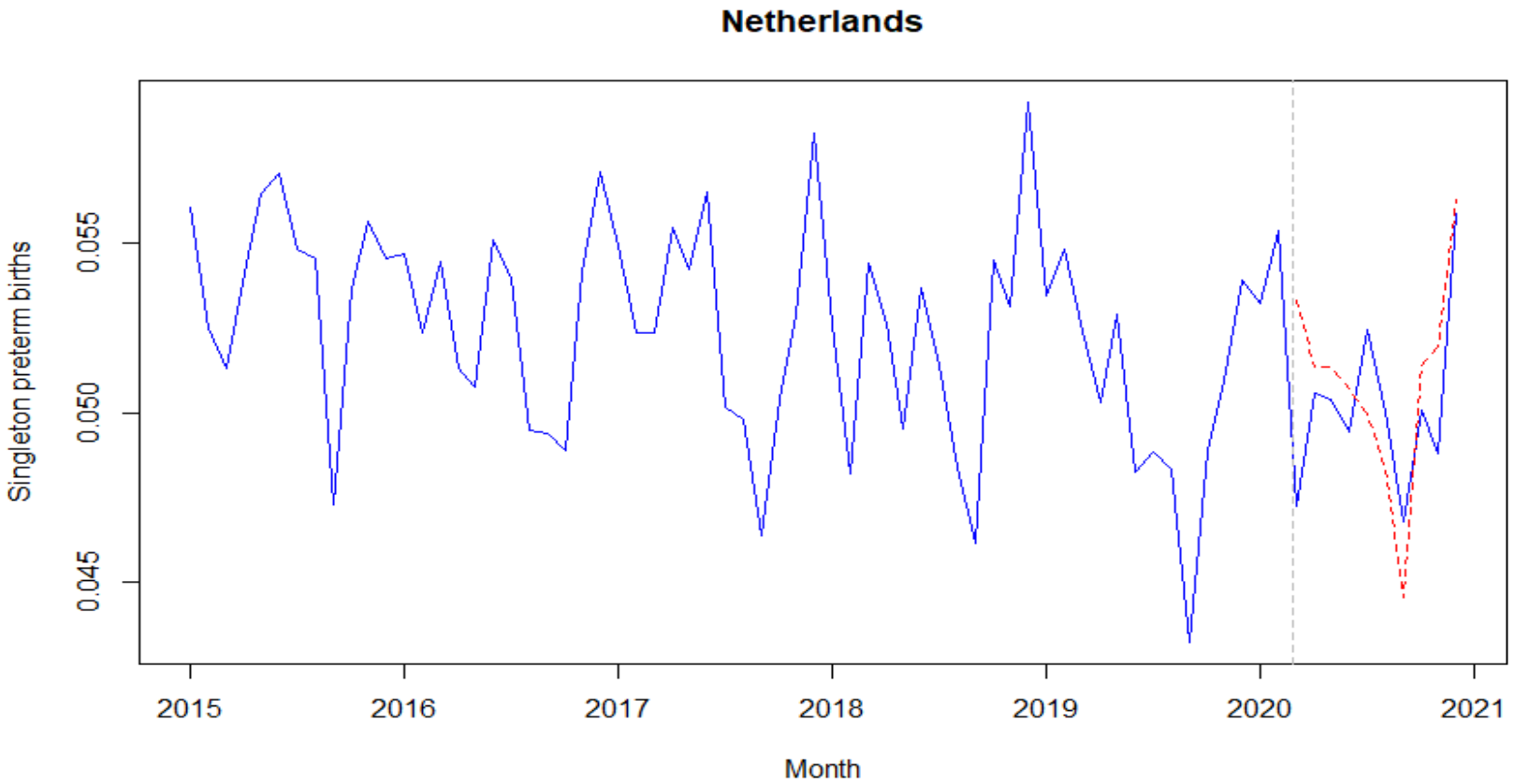
Time series (ARIMA*) models using monthly data



* Autoregressive integrated moving average

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Singleton preterm birth rate

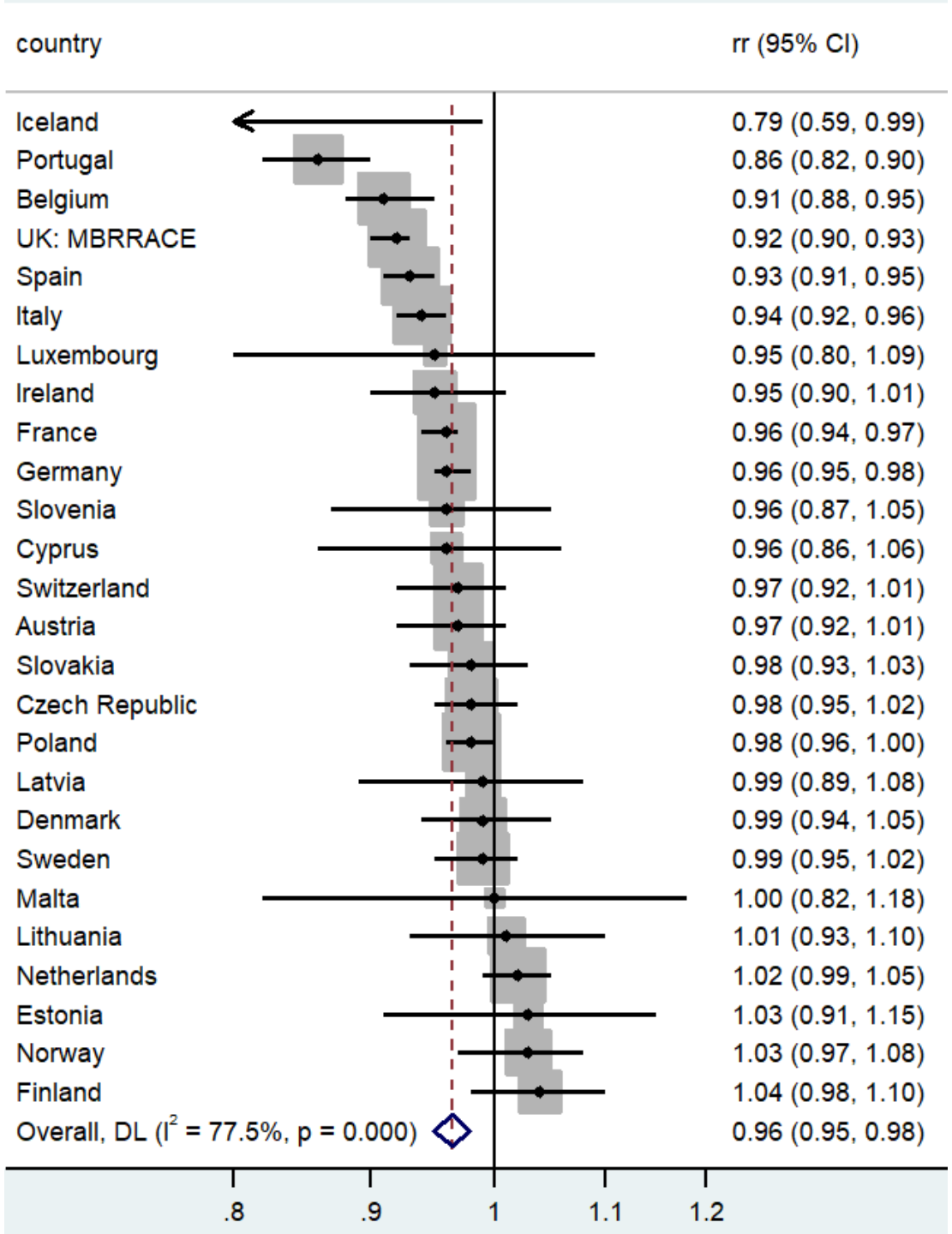
Pooled estimate
RR=0.96 (0.96 to 0.98) = 4% decrease in preterm birth

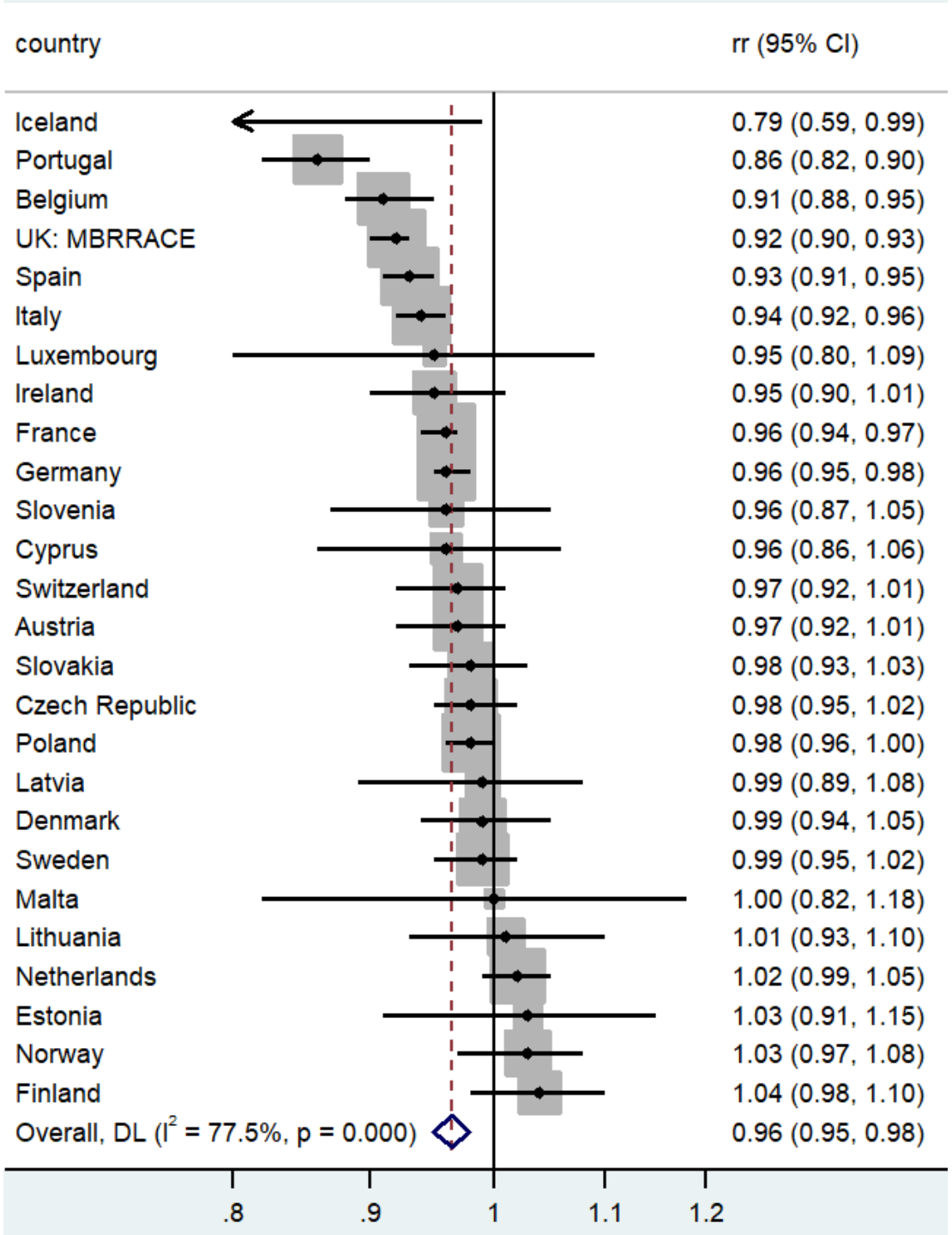
High heterogeneity
I^2 = 77.5% (proportion of total variation in effect estimate due to between-study heterogeneity)

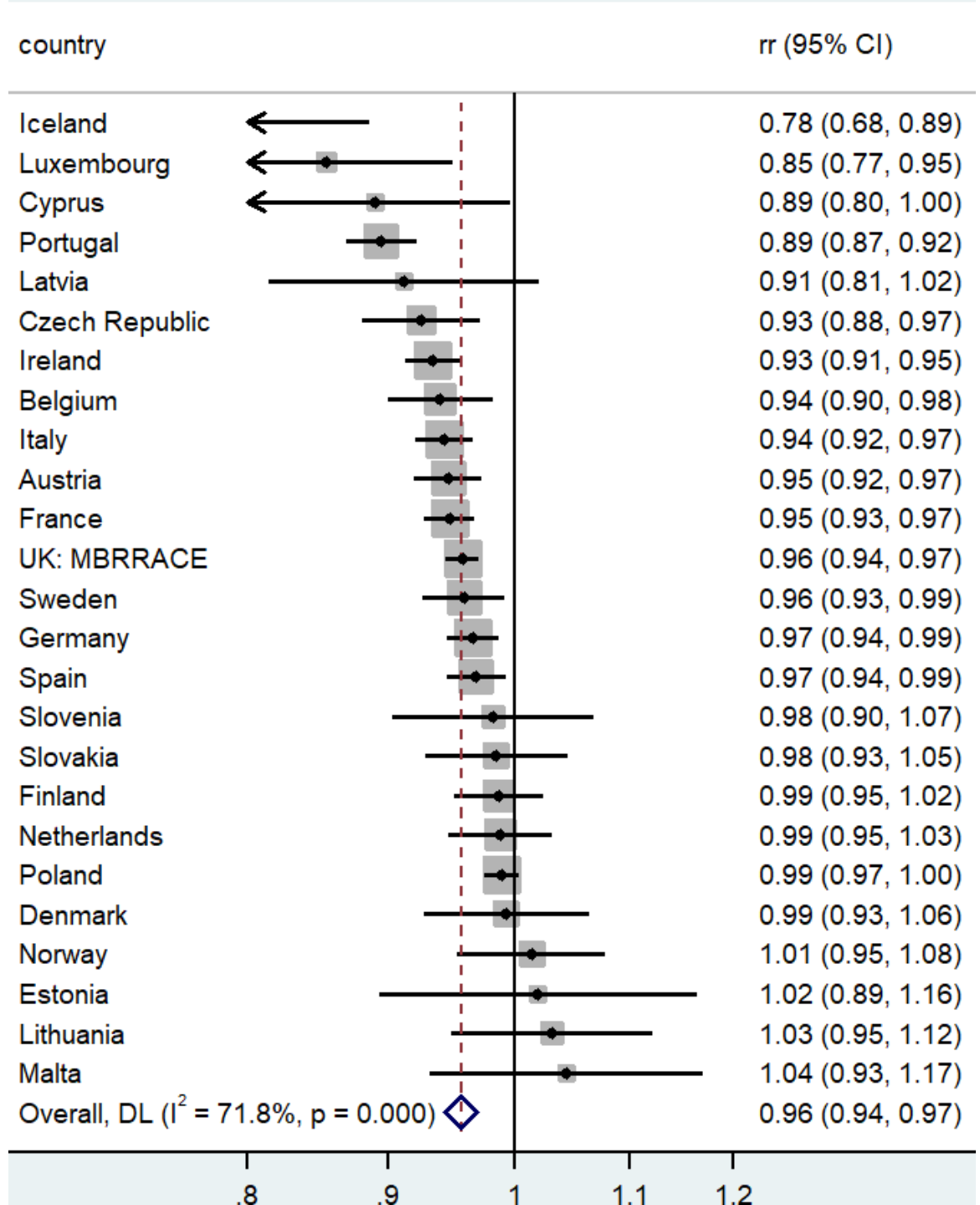
Range of effects = 10% decrease in preterm birth to moderate increase of 3 to 4%.

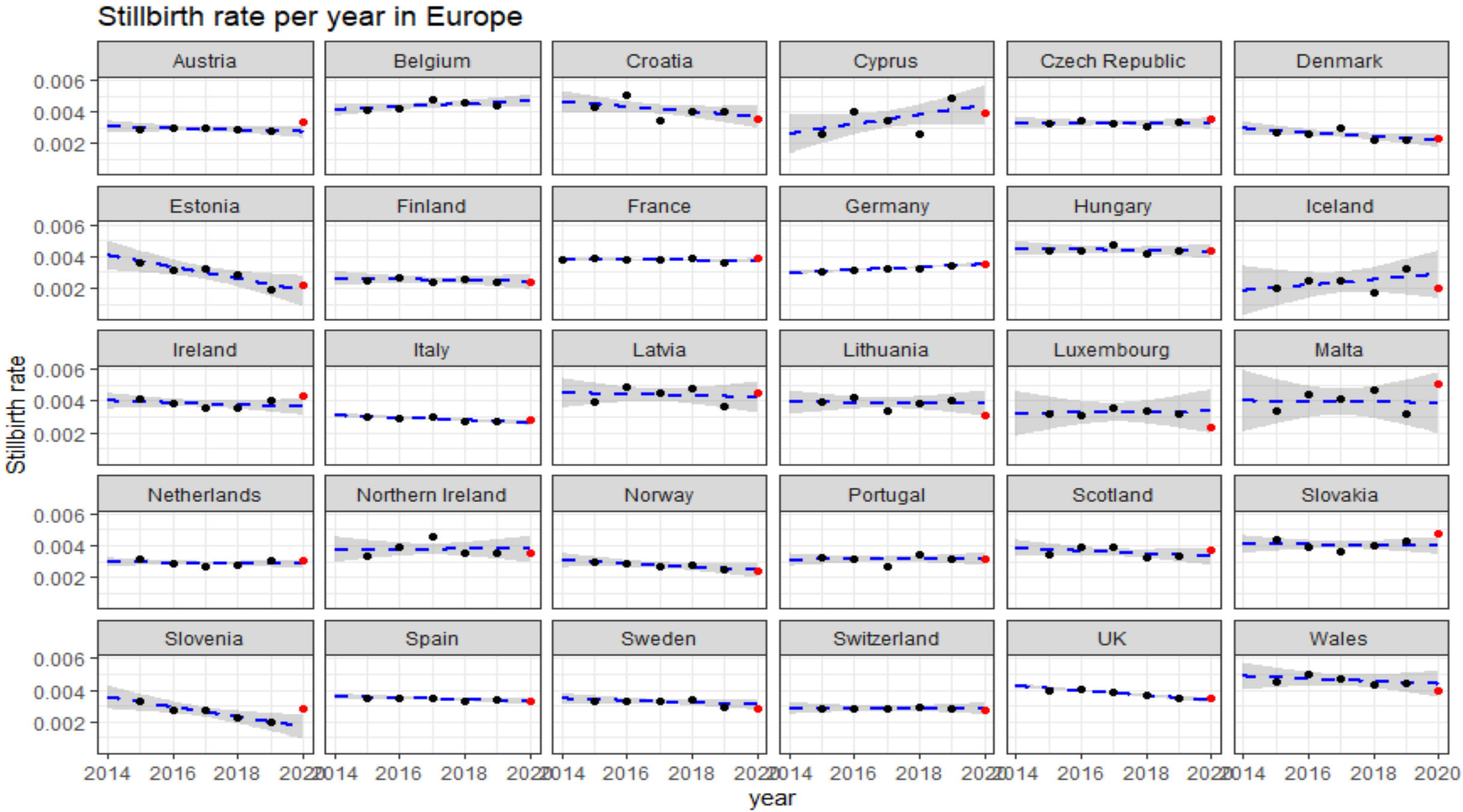
Countries with stronger effects: Portugal– Belgium – - UK - Spain – Italy – France

Countries with no effects: Nordic and Baltic countries, Netherlands




country
rr (95% CI)
Iceland 0.79 (0.59, 0.99)
Portugal 0.86 (0.82, 0.90)
Belgium 0.91 (0.88, 0.95)
UK: MBRRACE 0.92 (0.90, 0.93)
Spain 0.93 (0.91, 0.95)
Italy 0.94 (0.92, 0.96)
Luxembourg 0.95 (0.80, 1.09)
Ireland 0.95 (0.90, 1.01)
France 0.96 (0.94, 0.97)
Germany 0.96 (0.95, 0.98)
Slovenia 0.96 (0.87, 1.05)
Cyprus 0.96 (0.86, 1.06)
Switzerland 0.97 (0.92, 1.01)
Austria 0.97 (0.92, 1.01)
Slovakia 0.98 (0.93, 1.03)
Czech Republic 0.98 (0.95, 1.02)
Poland 0.98 (0.96, 1.00)
Latvia 0.99 (0.89, 1.08)
Denmark 0.99 (0.94, 1.05)
Sweden 0.99 (0.95, 1.02)
Malta 1.00 (0.82, 1.18)
Lithuania 1.01 (0.93, 1.10)
Netherlands 1.02 (0.99, 1.05)
Estonia 1.03 (0.91, 1.15)
Norway 1.03 (0.97, 1.08)
Finland 1.04 (0.98, 1.10)
Overall, DL (I^2 = 77.5%, p = 0.000) 0.96 (0.95, 0.98)
.8
.9
1
1.1
1.2


country
rr (95% CI)
Iceland 0.78 (0.68, 0.89)
Luxembourg 0.85 (0.77, 0.95)
Cyprus 0.89 (0.80, 1.00)
Portugal 0.89 (0.87, 0.92)
Latvia 0.91 (0.81, 1.02)
Czech Republic 0.93 (0.88, 0.97)
Ireland 0.93 (0.91, 0.95)
Belgium 0.94 (0.90, 0.98)
Italy 0.94 (0.92, 0.97)
Austria 0.95 (0.92, 0.97)
France 0.95 (0.93, 0.97)
UK: MBRRACE 0.96 (0.94, 0.97)
Sweden 0.96 (0.93, 0.99)
Germany 0.97 (0.94, 0.99)
Spain 0.97 (0.94, 0.99)
Slovenia 0.98 (0.90, 1.07)
Slovakia 0.98 (0.93, 1.05)
Finland 0.99 (0.95, 1.02)
Netherlands 0.99 (0.95, 1.03)
Poland 0.99 (0.97, 1.00)
Denmark 0.99 (0.93, 1.06)
Norway 1.01 (0.95, 1.08)
Estonia 1.02 (0.89, 1.16)
Lithuania 1.03 (0.95, 1.12)
Malta 1.04 (0.93, 1.17)
Overall, DL (I^2 = 71.8%, p = 0.000) 0.96 (0.94, 0.97)
.8
.9
1
1.1
1.2

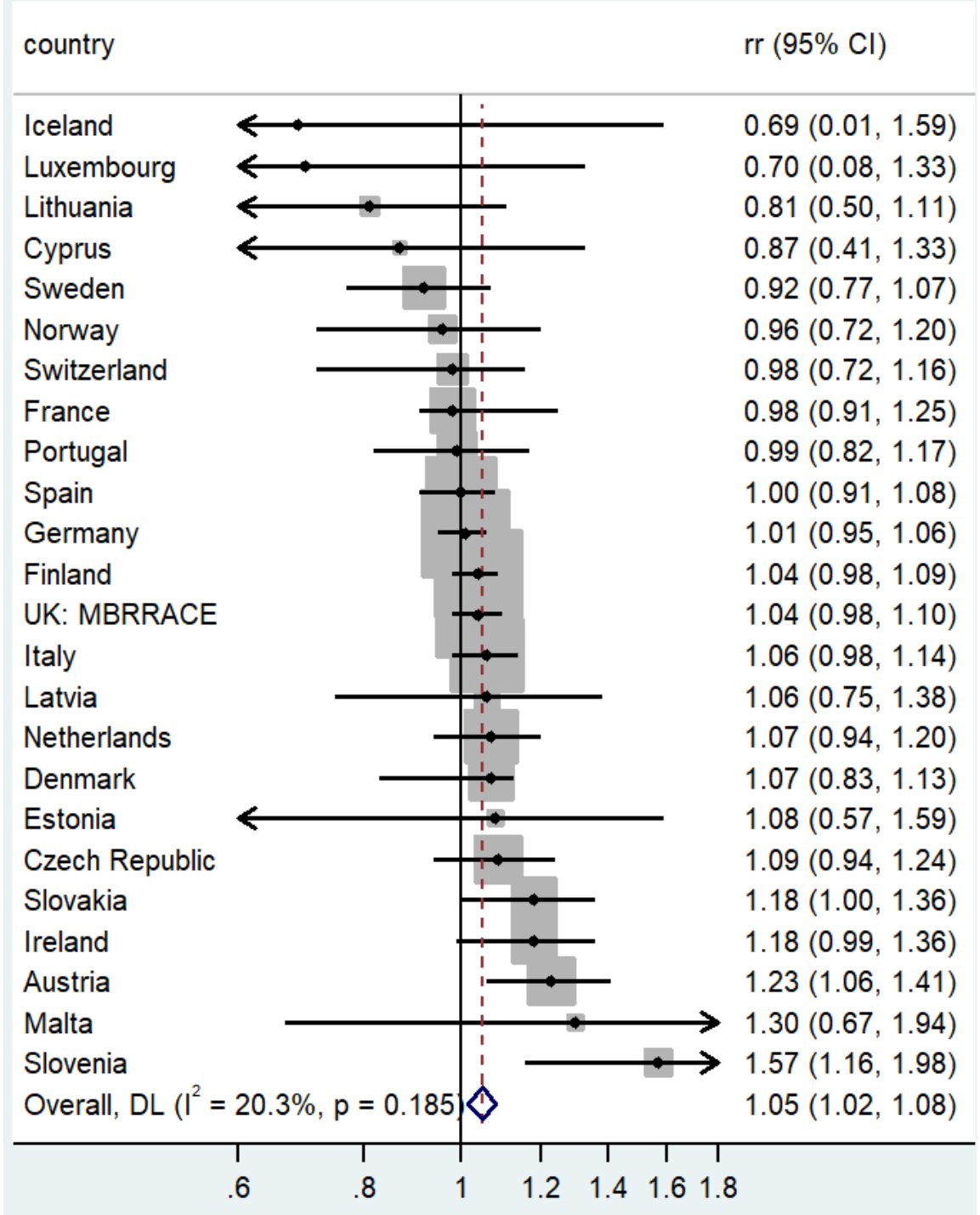

Stillbirth rate per year in Europe
Austria
Belgium
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Hungary
Iceland
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands
Northern Ireland
Norway
Portugal
Scotland
Slovakia
Slovenia
Spain
Sweden
Switzerland
UK
Wales
Stillbirth rate
0.006
0.004
0.002
2014
2016
2018
2020
year

Stillbirth rate

Estimate of pooled effect
RR=1.05 (1.02 to 1.08) = 5% increase in stillbirth

Lower heterogeneity
I^2 = 20.3% (proportion of total variation in effect estimate due to between-study heterogeneity)

Range of effects = No decreases significant / Austria higher stillbirth rates



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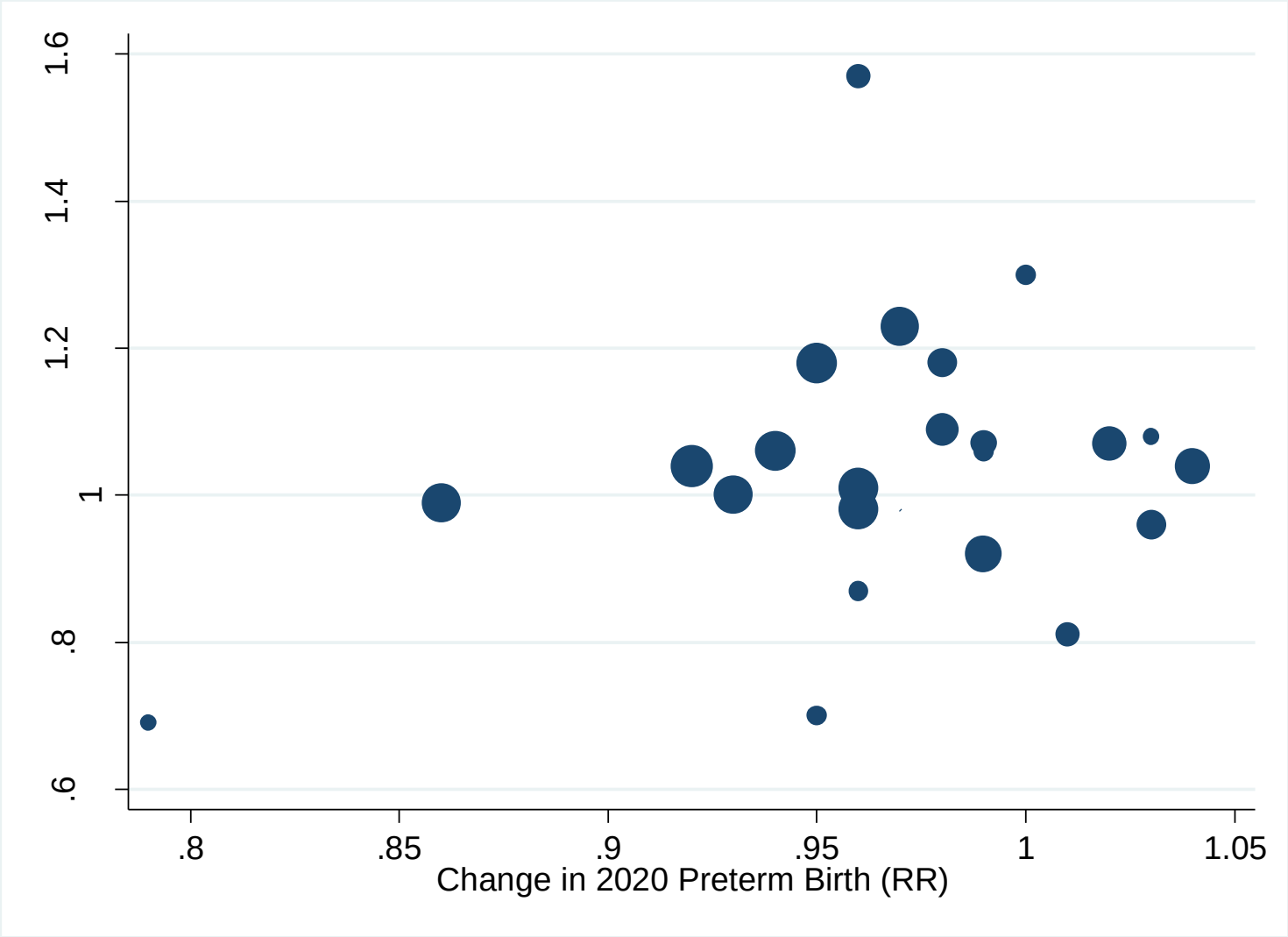
Association between changes in stillbirth and preterm birth



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Summary and discussion

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- COVID-19 in 2020 did not impact all countries in the same way.
- A puzzling decline in preterm birth in some countries
  - PTB meta-analyses– OR: 0.91 (0.84-0.99), 12 studies 01/2021
  - OR: 0.94 (0.91–0.98), 28 studies 05/2021;
  - OR 0.99 (0.95–1.03) 8 population studies.
- Increase in stillbirth in many countries, not more pronounced in countries with decline in preterm birth rate
- Our study confirms this high variability in indirect effects of the epidemic on pregnant women and babies in European countries
  - some policies more protective of pregnant women and newborns than other?
  - Women's experiences of the pandemic different?
  - Interaction with other health system factors?

Chmielewska et al. Lancet Global Health (2021), Yang et al. Acta Obstetr. (2022)

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Conclusions: population birth data

Shows the feasibility and value of bringing population birth data together in Europe

BJOG An International Journal of Obstetrics and Gynaecology
Royal College of Obstetricians & Gynaecologists

DOI: 10.1111/1471-0528.16946
www.bjog.org

Commentary

Population birth data and pandemic readiness in Europe

Euro-Peristat Research Network*

**Correspondence:* J Zeitlin, Obstetrical, Perinatal and Pediatric Epidemiology Research Team INSERM UMR 1153 53 avenue de l'observatoire 75014 Paris, France. Email: jennifer.zeitlin@inserm.fr

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EURO-PERISTAT COUNTRY TEAMS

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Austria
Belgium
Bulgaria
Croatia
Cyprus
Czech Rep.
Denmark
Greece
Hungary
Lithuania
Luxembourg
Portugal
Romania
Switzerland
UK

Thank you for the input and effort of the Euro-Peristat data hubs

Support from the team at WP7
Other use cases in WP6

https://www.europeristat.com/index.php/our-network/country-teams.html

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Monitoring COVID-19 related changes in population mental health

C Rodríguez-Blázquez[1], S Aldridge[2], E Bernal-Delgado[3], L Dolanski-Aghamanoukjan[4], F Estupiñán-Romero[3], C Garriga[1], M Gissler[5,6], RA Lyons[2], S Sagerschnig[4], H Tolonen[5]

1. Instituto de Salud Carlos III, Madrid, Spain. 2. Population Data Science, Swansea University Medical School, Swansea, United Kingdom. 3. Institute for Health Sciences in Aragon (IACS), Zaragoza, Spain. 4. Austrian National Public Health Institute, Vienna, Austria. 5. THL Finnish Institute for Health and Welfare, Helsinki, Finland. 6. Karolinska Institute, Stockholm, Sweden.

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN
Instituto de Salud Carlos III

www.phiri.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

Background

The COVID-19 pandemic, and its consequences in terms of control measures and restrictions to normal life, has impacted the population mental health.

Table 3: Proportion of respondents reporting having negative feelings by age and gender, EU27 (%)

		Summer 2020			Spring 2021		
		Tense	Lonely	Depressed	Tense	Lonely	Depressed
Men	18–34 years	34	25	21	46	35	34
	35–49 years	30	21	19	41	31	32
	50+ years	22	18	15	28	26	23
Women	18–34 years	45	30	28	52	38	40
	35–49 years	38	22	27	49	34	39
	50+ years	24	18	17	35	30	29

Notes: *Green = lowest value, red = highest value. All differences between the two time periods are statistically significant. Any discrepancies between the figures in the text and table are due to rounding.*

Source: Living, working and COVID-19 e-survey data. Mental health and trust decline across EU as pandemic enters another year. EuroFound, 2021.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

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Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science

Emily A Holmes*, Rory C O'Connor*, V Hugh Perry, Irene Tracey, Simon Wessely, Louise Arseneault, Clive Ballard, Helen Christensen, Roxane Cohen Silver, Ian Everall, Tamsin Ford, Ann John, Thomas Kabir, Kate King, Ira Madan, Susan Michie, Andrew K Przybylski, Roz Shafran, Angela Sweeney, Carol M Worthman, Lucy Yardley, Katherine Cowan, Claire Cope, Matthew Hotopf†, Ed Bullmore†

Lancet Psychiatry 2020; 7: 547–60
https://doi.org/10.1016/S2215-0366(20)30168-1

Bidirectional associations between COVID-19 and psychiatric disorder: retrospective cohort studies of 62 354 COVID-19 cases in the USA

Maxime Taquet, Sierra Luciano, John R Geddes, Paul J Harrison

Lancet Psychiatry 2021; 8: 130–40
https://doi.org/10.1016/ S2215-0366(20)30462-4

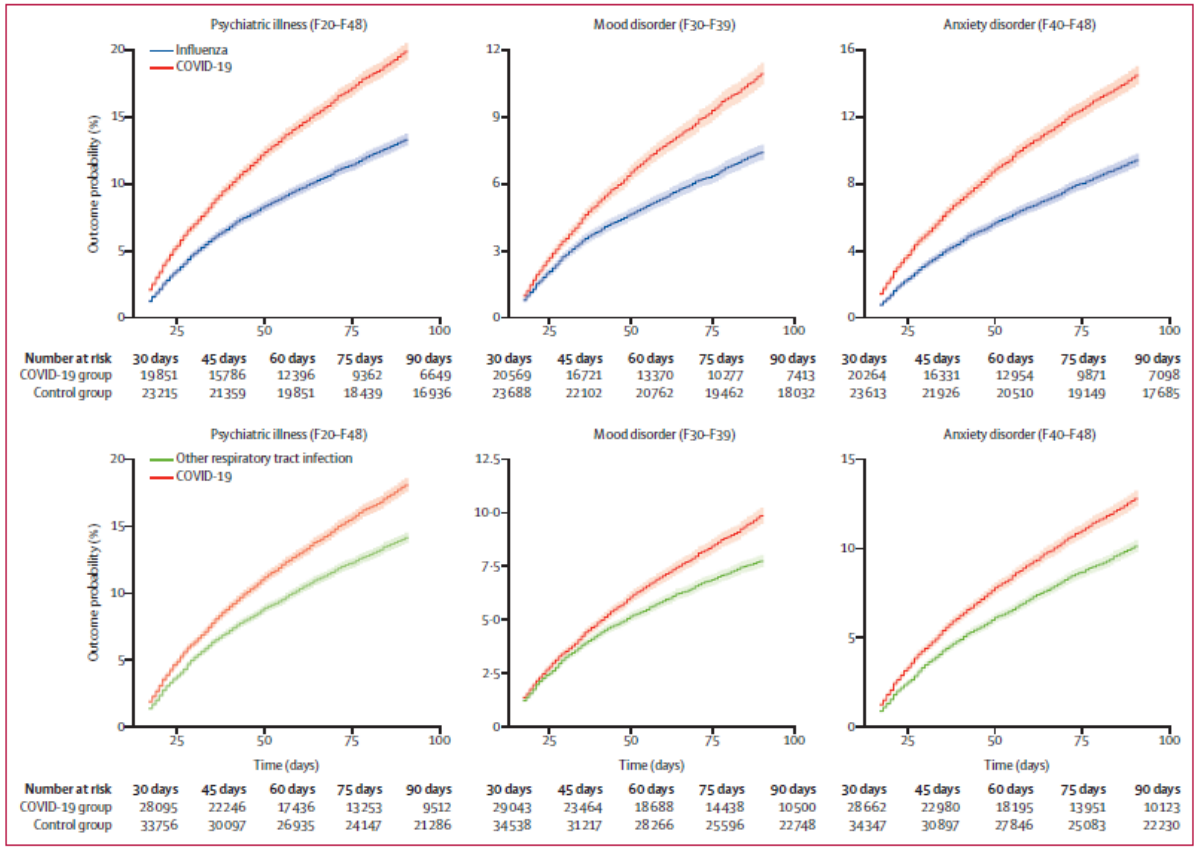

Figure 2: **Kaplan-Meier curves for any (first or recurrent) psychiatric diagnoses after COVID-19 compared with influenza and other respiratory tract infections**
Curves for the other control health events are presented in the appendix (p 29). Shaded areas represent 95% CIs. The number of subjects within each cohort corresponds to all those who did not have the outcome before the follow-up period.

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Use Case D:
COVID-19 Related changes in population mental health

EUROPEAN PUBLIC HEALTH CONFERENCE
BERLIN | 9-12 NOVEMBER 2022

Objective:

To measure changes in population mental health associated with the COVID-19 pandemic in several European countries

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

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Use Case D: COVID-19 related changes in population mental health

Objective: To measure changes in population mental health associated with the COVID-19 pandemic in several European countries

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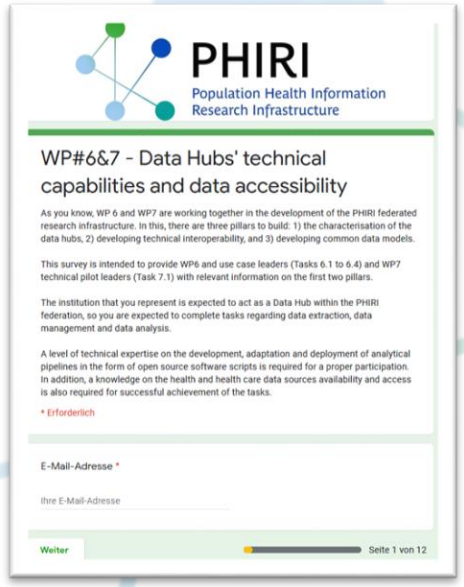
Methods

Two layer questionnaire:

1. Aims to get a better sense on the actual access to data and data hubs' capabilities

2. A second round survey, specific of each use case, to start off the process of harmonising data throughout a common data model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WP#6&7 - Data Hubs' technical capabilities and data accessibility

As you know, WP 6 and WP7 are working together in the development of the PHIRI federated research infrastructure. In this, there are three pillars to build: 1) the characterisation of the data hubs, 2) developing technical interoperability, and 3) developing common data models.

This survey is intended to provide WP6 and use case leaders (Tasks 6.1 to 6.4) and WP7 technical pilot leaders (Task 7.1) with relevant information on the first two pillars.

The institution that you represent is expected to act as a Data Hub within the PHIRI federation, so you are expected to complete tasks regarding data extraction, data management and data analysis.

A level of technical expertise on the development, adaptation and deployment of analytical pipelines in the form of open source software scripts is required for a proper participation. In addition, a knowledge on the health and health care data sources availability and access is also required for successful achievement of the tasks.

* Erforderlich

E-Mail-Adresse *

Ihre E-Mail-Adresse

Weiter

Seite 1 von 12

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Research Question

Has the mental health status (depression/anxiety) of the general population changed during the COVID-19 pandemic?

This RQ was addressed using **electronic health records (EHR)**:

- Indicators such as prescription of antidepressants and anxiolytics, visits to primary care or specialist care with an episode of depression/anxiety, etc.

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Common data model according to the research question

Data model entity	Variable						
Associated entity in ERD	Label (var_label)	Name (var_concept)	Level (required/recommended /optional)	Classification/Encoding	Units	Format	Description
patient	**patient_id**	patient identificator	required	private key ciphering function	none	string	patient pseudonymized identificator
patient	**sex**	patient's sex	required		none	integer	patient's sex
patient	**age_nm**	age	required	none	years	integer	patient's age at the moment
patient	**socecon_lvl_cd**	socioeconomic level	optional	quintile	quintiles	integer	patient's socioeconomic level (quintile)
patient	**country_cd**	country (residence)	required	ISO3166	none	string	patient's country of residence
patient	**country_origin_cd**	country (origin)	recommended	ISO3166	none	string	patient's country of origin
patient	**diagnosis**	diagnosis	required	icd-10/icd-10_mc/icd-9-mc/SNC	none	string	patient diagnosis
date	**dx_date**	date of diagnosis	required	dd-mm-yyyy	date	integer	date of diagnosis
prescription	**drug**	drug	recommended	ATC	none	string	patient's prescription
date	**drug_date**	date of prescription	recommended	dd-mm-yyyy	date	integer	date of prescription
visit (contact w healthcare service)	**prim_visit**	number of visits to primary care	recommended	ICPC	visits	integer	number of visits to primary care
visit (contact w healthcare service)	**hosp_visit**	number of visits to hospital unit	recommended	ICPC	visits	integer	number of visits to hospital unit
visit (contact w healthcare service)	**emer_visit**	number of visits to emergency	recommended	ICPC	visits	integer	number of visits to emergency or unplanned visits
observation period	**visit_date**	date of visit	recommended	dd-mm-yyyy	date	integer	date of visit

March 22, 2022

Software Open Access

PHIRI - WP6 - Use Case D scripts for local analyses (R Markdown)

Sarah Aldridge; Javier González-Galindo; Francisco Estupiñán-Romero; Cesar Garriga

Contact person(s)

Carmen Rodríguez-Blazquez

Researcher(s)

Enrique Bernal-Delgado; Maria João Forjaz; Hannah Tolonen; Mike Gissler

The PHIRI Federated Research Infrastructure (FRI) is supported by a containerized reproducible solution for data analysis to be deployed on-premises by each participant partner (a.k.a PHIRI-app).

This solution is based on the identification of the relevant data sources for each cases study (including the demonstration pilot), the development of the common data models and the ***analytical pipelines***, and enables the FAIR reporting of the rapid cycle outputs.

The R Markdown script is provided, integrated within the PHIRI-app, for PHIRI Use Case D local analyses.

Here, the R Markdown script is provided with:

a) synthetic dataset build following the specifications from the Use Case D Common Data Model,

b) instructions on where to find the synthetic dataset within the Use Case D Common Data Model description (HTML), and

c) an HTML interactive report produced by performing the analyses proposed within the R Markdown using the synthetic dataset above.

These elements are provided to facilitate collaboration on testing and improving the Use Case D analytical pipeline within the scope of PHIRI WP6.

If you wish to contribute to the development of the PHIRI - Use Case D analysis, please contact the WP6 Coordinator through the PHIRI website.

Aldridge et al. (2022). PHIRI - WP6 - Use Case D scripts for local analyses (R Markdown) (1.1.0). Zenodo. https://doi.org/10.5281/zenodo.6377112

Publication date:
March 22, 2022

DOI:
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Grants:
European Commission:
- PHIRI - Population Health Information Research Infrastructure (101018317)

Versions

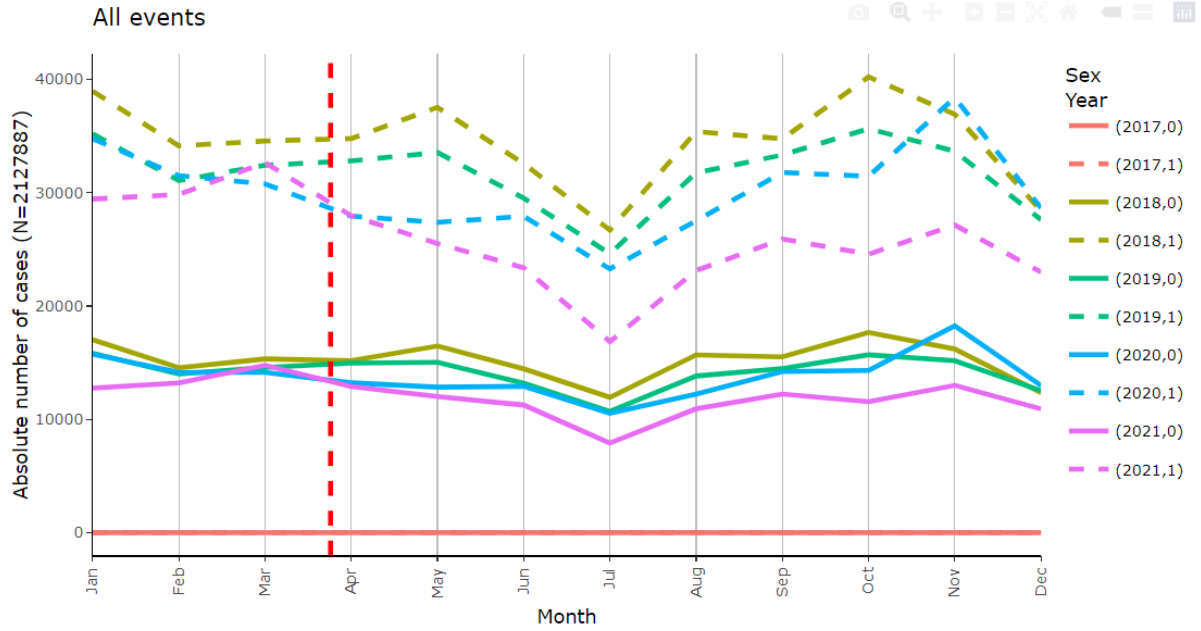
Version 1.1.0 10.5281/zenodo.6377112	Mar 22, 2022

Results by country

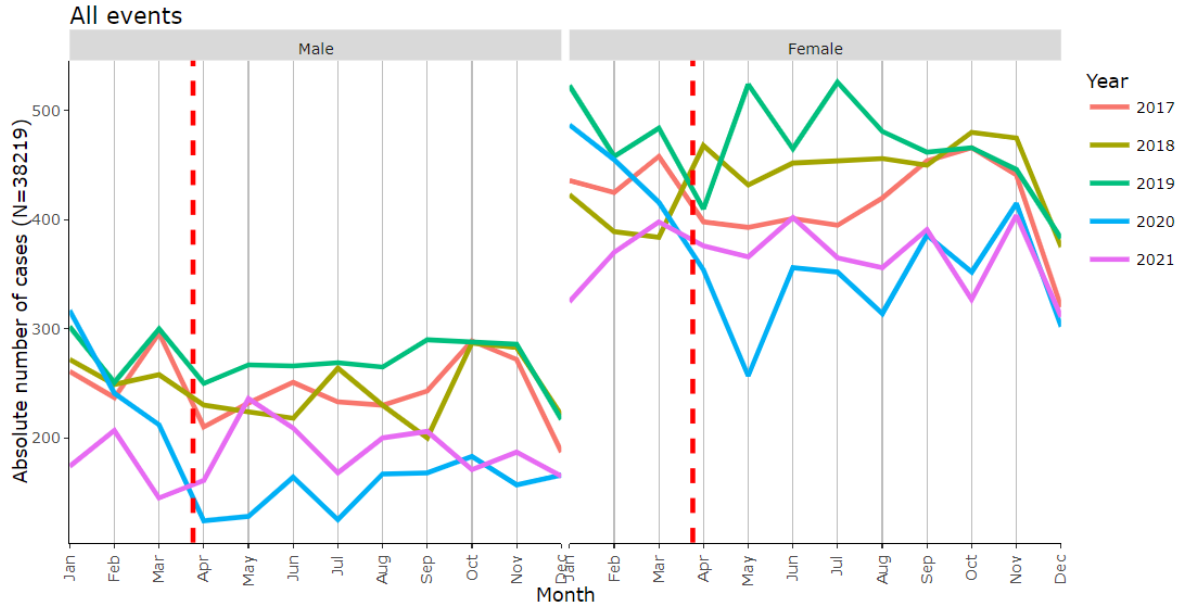
Results from 6 datahubs:

- Aragon (Spain)
- Austria
- Croatia
- Finland
- Romania
- Wales (UK)

Finland



Wales (UK)



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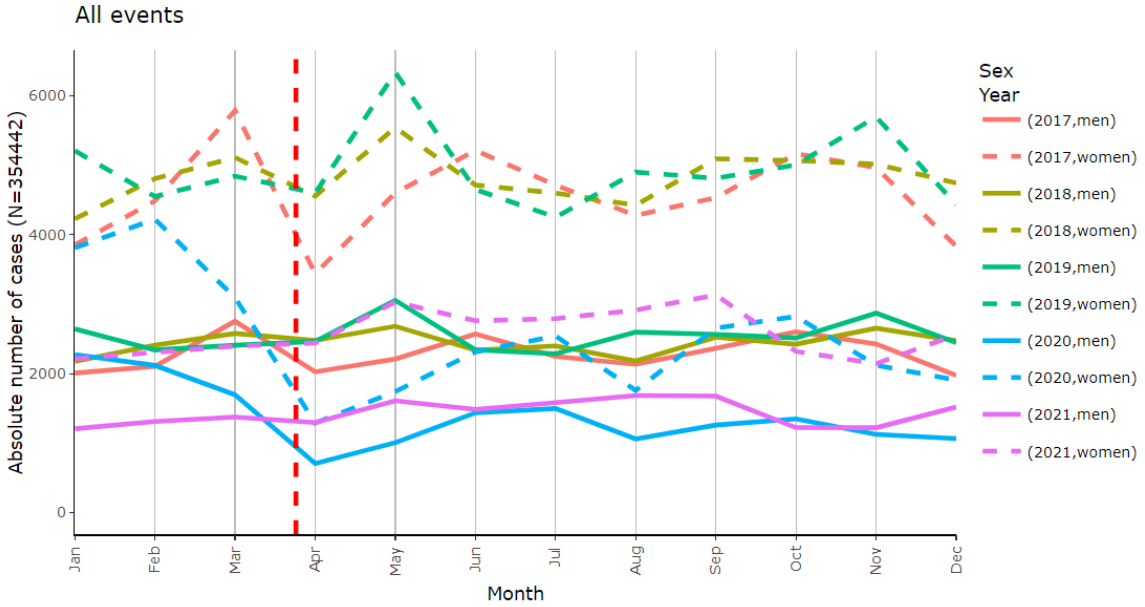
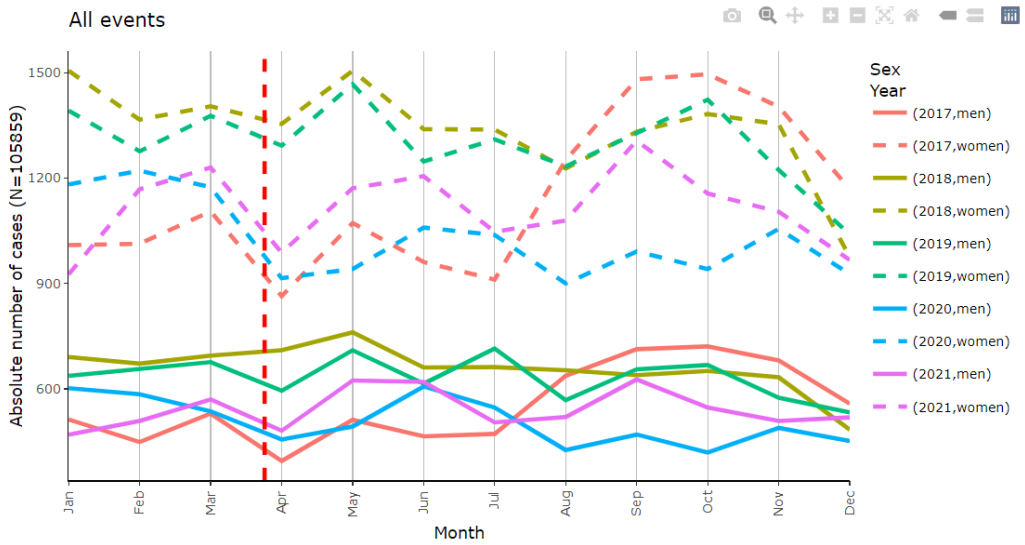
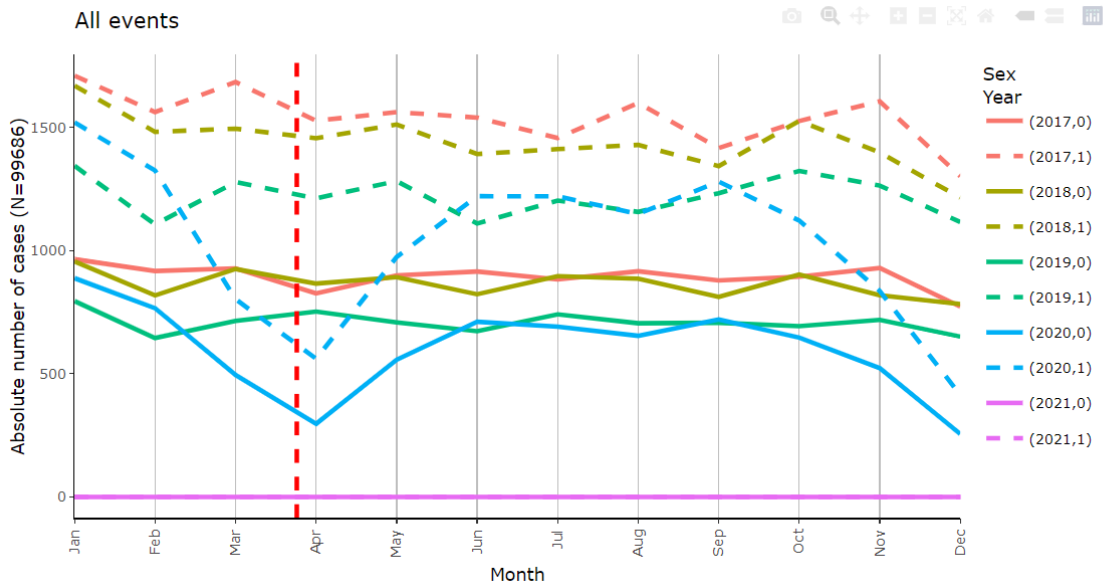
Romania



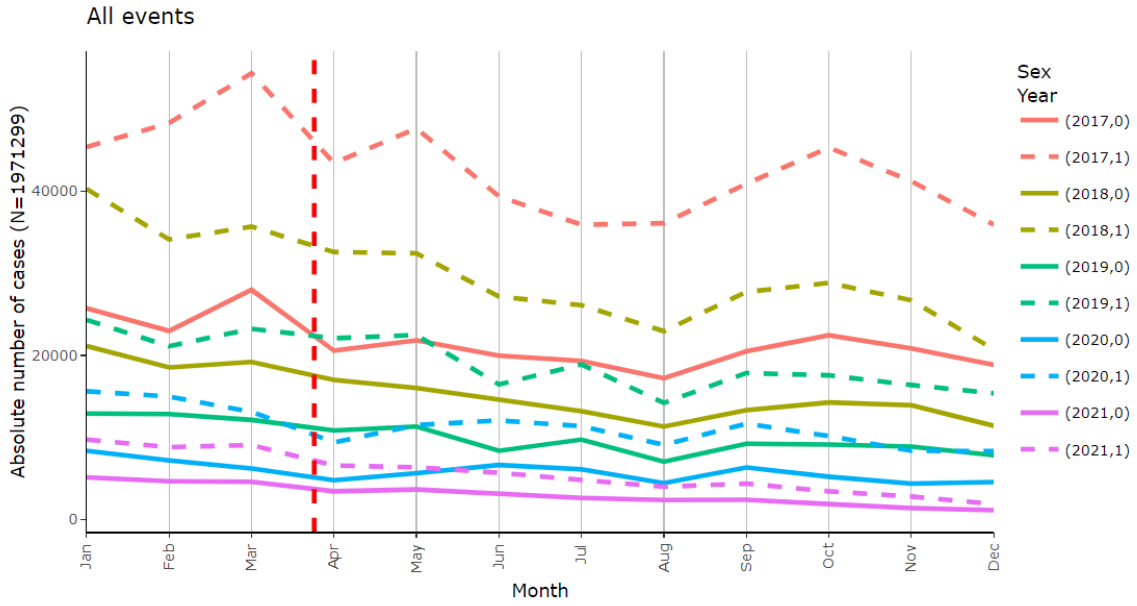
Aragon, Spain



Austria



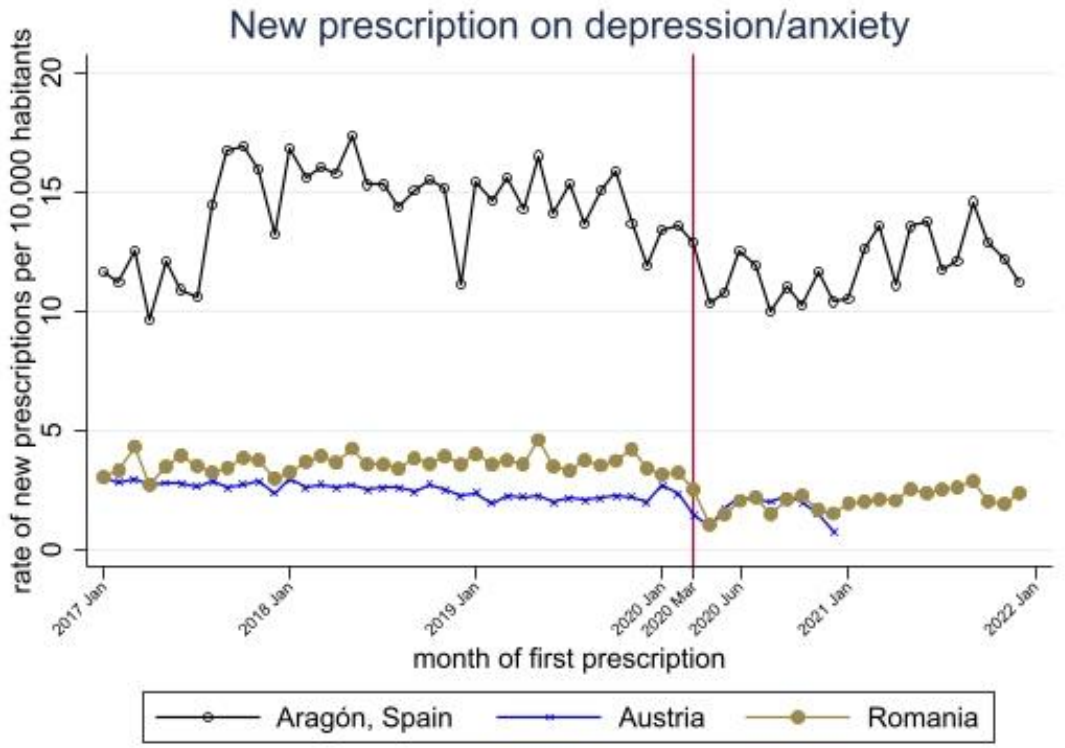
Croatia



WW

Results: cross-country comparison

Preliminary analysis of new prescriptions



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Conclusions

- Results showed a **decrease** in diagnoses of depression and anxiety and drug prescriptions in 2020 in participant countries compared with previous years.
- **EHR for the secondary use** can be retrieved in a common way across Europe to analyze and compare the impact of COVID-19 in population mental health in European countries.
- The use case D facilitates research by making scalable, reproducible methods available within PHIRI.
- Lessons learned during this exercise could be used to overcome difficulties and allow for cross-country comparisons.

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Thank you for your attention!

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