

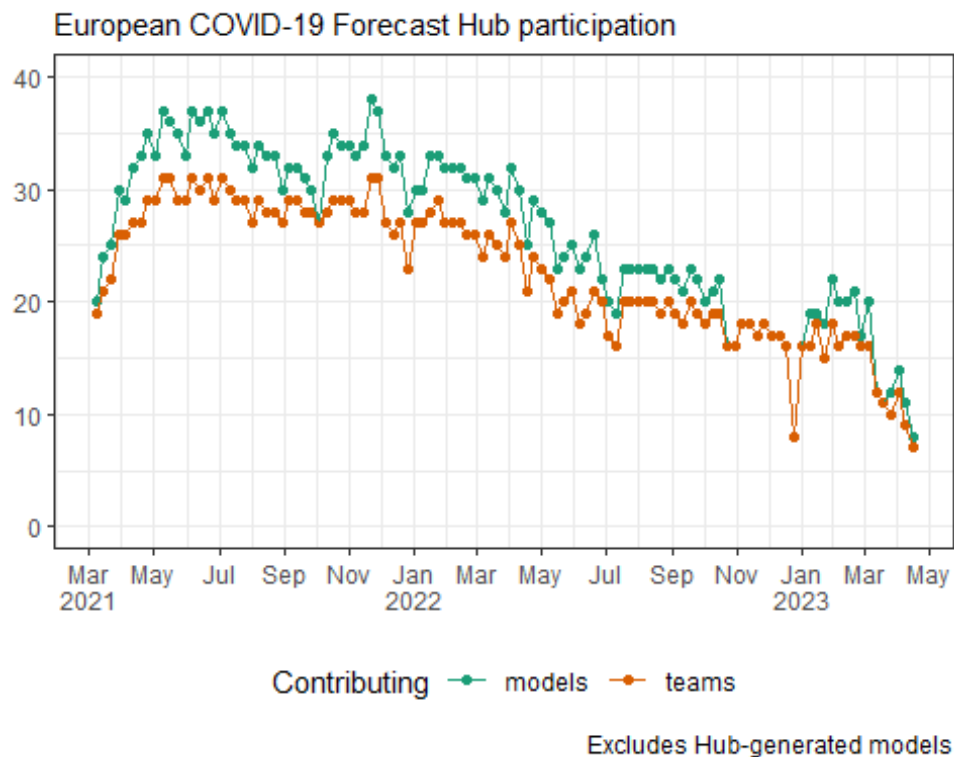
# The European COVID-19 Forecasting Hub: Participation

As of 18 April 2023

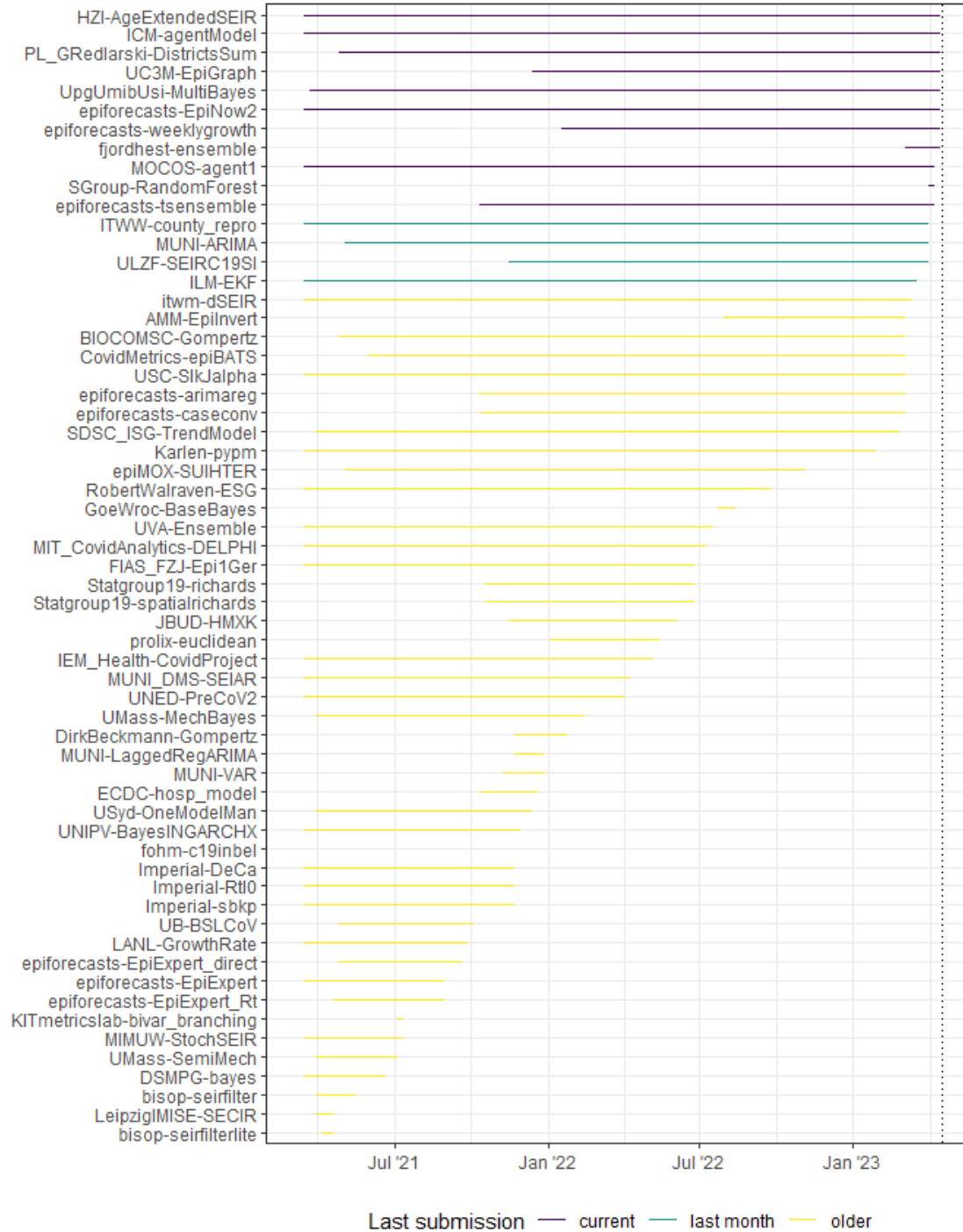
We report on teams' involvement in the European COVID-19 Forecast Hub between 7 March 2021 and 16 April 2023. We exclude two models created by the Hub each week.

A total 46 independent teams have participated in the Hub over time, contributing 60 unique models. At most, 31 teams were contributing one or more models to the Hub in any one week. In the last month, we collected forecasts from 15 unique models.

*Participating teams and models over time*



## Individual teams' participation



## Complete model information

Model name	Authors	Team	Methods	Complete meta data
AMM-EpiInvert	Luis Alvarez, Jean-David Morel, Jean-Michel Morel	AMM	Learning from the past a short time forecast of the COVID-19 incidence curve trend.	Meta data
BIOCOMSC-Gompertz	Martí Català, Enric Álvarez, Sergio Alonso, Daniel López, Clara Prats	BIOCOMSC	Empirical model based on cases and deaths dynamics.	Meta data
bisop-seirfilter	Martin Šmíd, Jan Trnka, Vít Tuček, Milan Zajíček	Centre for Modelling of Biological and Social Processes	please see <a href="https://www.medrxiv.org/content/10.1101/2021.02.16.21251834v1">https://www.medrxiv.org/content/10.1101/2021.02.16.21251834v1</a>	Meta data
bisop-seirfilterlite	Martin Šmíd, Jan Trnka, Vít Tuček, Milan Zajíček	Centre for Modelling of Biological and Social Processes	A simple stochastic SEIR state space model	Meta data
CovidMetrics-epiBATS	Tom Zimmermann, Arne Rodloff	University of Cologne Covid Metrics	Forecasts are based on TBATS - models (DeLivera, Hyndman and Snyder (2011)) and are updated daily for each German state.	Meta data

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<a href="#">DirkBeckmann-Gompertz</a>	Dr. Dirk Beckmann	DirkBeckmann	gompertz model	<a href="#">Meta data</a>
<a href="#">DSMPG-bayes</a>	Sebastian B. Mohr, Jonas Dehning, Viola Priesemann	Priesemann Group, MPI-DS	Bayesian inference of SIR-dynamics	<a href="#">Meta data</a>
<a href="#">ECDC-hosp_model</a>	Rok Grah, Rene Niehus	ECDC Modelling Team	mechanistic estimation of hospitalisations using age disaggregated data of weekly cases, vaccination, and case hospitalisation rates	<a href="#">Meta data</a>
<a href="#">epiforecasts-arimareg</a>	Sophie Meakin	epiforecasts	A regression model forecasting admissions from 1-week-lagged cases, with ARIMA errors. Fit to weekly data.	<a href="#">Meta data</a>
<a href="#">epiforecasts-caseconv</a>	Sophie Meakin	epiforecasts	A convolution of cases and a delay distribution fit to weekly data.	<a href="#">Meta data</a>
<a href="#">epiforecasts-EpiExpert</a>	Nikos Bosse, Sam Abbott, Sebastian Funk	Epiforecasts / London School of Hygiene and Tropical Medicine	Mean ensemble of human predictions	<a href="#">Meta data</a>
<a href="#">epiforecasts-EpiExpert_direct</a>	Nikos Bosse, Sam Abbott, Sebastian Funk	Epiforecasts / London School of Hygiene and Tropical Medicine	Mean ensemble of human predictions	<a href="#">Meta data</a>
<a href="#">epiforecasts-EpiExpert_Rt</a>	Nikos Bosse, Sam Abbott, Sebastian Funk	Epiforecasts / London School of Hygiene and Tropical Medicine	Mean ensemble of human predictions of Rt which get mapped to cases and deaths using a renewal equation	<a href="#">Meta data</a>

Model name	Authors	Team	Methods	Complete meta data
<a href="#">epiforecasts-EpiNow2</a>	Nikos Bosse, Sam Abbott, Sebastian Funk	Epiforecasts / London School of Hygiene and Tropical Medicine	Semi-mechanistic estimation of the time-varying reproduction number for latent infections mapped to reported cases/deaths.	<a href="#">Meta data</a>
<a href="#">epiforecasts-tsensemble</a>	Sophie Meakin	epiforecasts	A mean ensemble of three autoregressive time series models (ARIMA, ETS and “naive” - future admissions are equal to the last observed week, with expanding uncertainty).	<a href="#">Meta data</a>
<a href="#">epiforecasts-weeklygrowth</a>	Sam Abbott	epiforecasts	A Bayesian autoregressive model using weekly incidence data, application of the forecast.vocs R package.	<a href="#">Meta data</a>
<a href="#">epiMOX-SUIHTER</a>	Giovanni Ardenghi, Giovanni Ziarelli, Luca Dede', Nicola Parolini, Alfio Quarteroni	epiMOX	Compartmental model SUIHTER	<a href="#">Meta data</a>
<a href="#">EuroCOVIDhub-baseline</a>	Hugo Gruson	European COVID-19 Forecast Hub	An baseline model against which other models can be evaluated	<a href="#">Meta data</a>
<a href="#">EuroCOVIDhub-ensemble</a>	Katharine Sherratt, Nikos Bosse, Sebastian Funk	European COVID-19 Forecast Hub	An ensemble, or model average, of submitted forecasts to the European COVID-19 Forecast Hub.	<a href="#">Meta data</a>
<a href="#">FIAS_FZJ-Epi1Ger</a>	Maria V. Barbaro	Frankfurt Institute for	An extended SEIR model with additional compartments for	<a href="#">Meta data</a>

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	ssa, Jan Fuhrmann, Stefan Krieg, Jan H. Meinke	Advanced Studies & Forschungszentrum Jülich	undetected cases	
<a href="#">fjordhest-ensemble</a>	Sasi Kandula, Gunnar Rø, Birgitte de Blasio	fjordhest	An inverse-WIS weighted ensemble of a mechanistic model, two time series models (ARIMA, ETS) and a random walk with drift model.	<a href="#">Meta data</a>
<a href="#">fohm-c19inbel</a>	Sharon Kuhlmann-Berenzon, Martin Camitz	FD-AN, Folkhälsomyndigheten	Negative binomial fit/projection on reported cases by age group, then converted to hospitalizations by risk assumptions updated circa monthly.	<a href="#">Meta data</a>
<a href="#">GoeWroc-BaseBayes</a>	Tobias Weber, Viktor Bezborodov, Tyll Krueger, Dominic Schuhmacher	GoeWroc	A mixture between a SIR and Bayesian modelling approach, with regard to a possible spatial extension and local $r$ values in later versions.	<a href="#">Meta data</a>
<a href="#">HZI-AgeExtendedSEIR</a>	Isti Rodiah, Berit Lange, Pratizio Vanella, Alexander Kuhlmann,	Helmholtz Zentrum fuer Infektionsforschung	Deterministic SEIR type model	<a href="#">Meta data</a>

Model name	Authors	Team	Methods	Complete metadata
ICM-agentModel	Wolfgang Bock Rafał Bartczuk, Łukasz Górski, Magdalena Gruziel-Słomka, Artur Kaczorek, Jan Kisielewski, Antoni Moszyński, Karol Niedzielowski, Jędrzej Nowosielski, Maciej Radwan, Franciszek Rakowski, Marcin Semeniuk, Jakub Zieliński	ICM / University of Warsaw	Agent-based model	Metadata
IEM_Health-CovidProject	Brad Suchoski, Steve Stage, Heidi Gurung, Sid Baccam	IEM Health	SEIR model projections for daily incident confirmed COVID cases and deaths by using AI to fit actual cases observed.	Metadata

Model name	Authors	Team	Methods	Complete meta data
<a href="#">ILM-EKF</a>	Stefan Heyder, Thomas Hotz	ILM	Extended Kalman filter based on reproduction equation	<a href="#">Meta data</a>
<a href="#">Imperial-DeCa</a>	Sangeeta Bhatia, Pierre Nouvellet	Imperial College London	Uses both cases and deaths to estimate an observed CFR. Projections are based on the estimated CFR.	<a href="#">Meta data</a>
<a href="#">Imperial-RtIO</a>	Sangeeta Bhatia, Pierre Nouvellet	Imperial College London	Jointly estimates initial incidence and reproduction number	<a href="#">Meta data</a>
<a href="#">Imperial-sbcp</a>	Sangeeta Bhatia, Pierre Nouvellet, Kris V Parag	Imperial College London	Optimises the window over which reproduction number is assumed to be constant.	<a href="#">Meta data</a>
<a href="#">itwm-dSEIR</a>	Jan Mohring, Neele Leithäuser, Michael Helmling	Fraunhofer Institute for Industrial Mathematics ITWM	Integral equation model based on age cohorts taking into account vaccination and testing. The parameters are adjusted to the counted cases and deaths.	<a href="#">Meta data</a>
<a href="#">ITWW-county_rep ro</a>	Przemyslaw Biecek, Viktor Bezborodov, Marcin Bodych, Jan Pablo Burgard, Stefan	ITWW	Forecasts of county level incidence based on regional reproduction numbers.	<a href="#">Meta data</a>



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	Heyder, Thomas Hotz, Tyll Krüger			
<a href="#">JBUD-HMXK</a>	Jozef Budzinski	JBUD	Heavily modified infection-age SIR-X model with waning immunity, vaccinations, seasonality and undetected cases.	<a href="#">Meta data</a>
<a href="#">Karlen-pypm</a>	Dean Karlen	Karlen Working Group	Discrete-time difference equations with long periods of constant transmission rate	<a href="#">Meta data</a>
<a href="#">KITmetricslab-bivar_branching</a>	Johannes Bracher	KITmetricslab	Delta-variant and other cases are modelled as independent branching processes, with weekly growth rates following random walks. Forecasts for 3 and 4 wk are likely unreliable.	<a href="#">Meta data</a>
<a href="#">LANL-GrowthRate</a>	Dave Osthus, Sara Del Valle, Carrie Manore, Brian Weaver, Lauren Castro, Courtney Shelley, Manhong (Mandy) Smith, Julie Spencer, Geoffrey Fairchild, Travis Pitts,	Los Alamos National Labs	This model makes predictions about the future, unconditional on particular intervention strategies. Statistical dynamical growth model accounting for population susceptibility.	<a href="#">Meta data</a>

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	Dax Gerts, Lori Dauelsberg, Ashlynn Daughton, Morgan, Gorris, Beth Hornbein, Daniel Israel, Nidhi Parikh, Deborah Shutt, Amanda Ziemann			
LeipzigIMI SE-SECIR	Yuri Kheifetz, Holger Kirsten, Markus Scholz	Universitaet Leipzig IMISE/GenStat	SECIR type model	Meta data
MIMUW-StochSEIR	Anna Gambin, Krzysztof Gogolewski, Blażej Miasojedow, Ewa Szczurek, Daniel Rabczenko, Magdalena	Faculty of Mathematics, Informatics, and Mechanics, University of Warsaw	Extended SEIR model	Meta data

Model name	Authors	Team	Methods	Complete meta data
	Rosińska			
<a href="#">MIT_Covid Analytics-DELPHI</a>	Michael Lingzhi Li, Hamza Tazi Bouardi, Dimitris Bertsimas	CovidAnalytics at MIT	This model makes predictions for future cases based on a heavily modified SEIR model taking into account underdetection and government intervention. Current interventions are assumed to continue.	<a href="#">Meta data</a>
<a href="#">MOCOS-agent1</a>	Marek Bawiec, Marcin Bodych, Tyll Krueger, Tomasz Ozanski, Barbara Pabjan, Agata Migalska, Przemysław Biecek, Viktor Bezborodov, Ewa Szczurek, Ewaryst Rafajłowicz, Ewa Rafajłowicz, Wojciech Rafajłowicz	MOCOS group	Agent-based microsimulation model	<a href="#">Meta data</a>
<a href="#">MUNI-</a>	Andrea	Masaryk	ARIMA model with outlier detection	<a href="#">Meta</a>

Model name	Authors	Team	Methods	Complete meta data
<a href="#">ARIMA</a>	Kraus, David Kraus	University	fitted to transformed weekly aggregated series.	<a href="#">data</a>
<a href="#">MUNI-LaggedReg ARIMA</a>	Andrea Kraus, David Kraus	Masaryk University	Regression of hospitalizations and deaths on lagged cases with ARIMA errors.	<a href="#">Meta data</a>
<a href="#">MUNI-VAR</a>	Andrea Kraus, David Kraus	Masaryk University	Vector autoregression model fitted to outlier-corrected transformed weekly aggregated series.	<a href="#">Meta data</a>
<a href="#">MUNI_DMS-SEIAR</a>	Veronika Eclerova, Lenka Pribylova	Department of Mathematics and Statistics Masaryk University Team	SEIAR model with A compartment of absent unobserved infected estimated from hospital data with incorporated mobility data dependence; optimized to the compartment of all exposed (unobserved included)	<a href="#">Meta data</a>
<a href="#">PL_GRedlarski-DistrictsSum</a>	Grzegorz Redlarski	Grzegorz Redlarski	Modified SIR method, applied to all districts. Forecasts for districts are summed up.	<a href="#">Meta data</a>
<a href="#">prolix-euclidean</a>	Loïc Pottier	prolix	Offsets obtained by correlations, best linear approximation of reproduction rates (using vaccination approximation) by least euclidean distance, and linear prediction.	<a href="#">Meta data</a>
<a href="#">RobertWalraven-ESG</a>	Robert Walraven	Robert Walraven	Multiple skewed gaussian distribution peaks fit to raw data	<a href="#">Meta data</a>
<a href="#">SDSC_ISG-TrendModel</a>	Ekaterina Krymova, Dorina Thanou, Benjamin Bejar Haro, Tao Sun, Gavin Lee,	Swiss Data Science Center / University of Geneva	The Trend Model predicts daily cases and deaths using linear extrapolation on the linear or log scale of the underlying trend estimated by a robust LOESS seasonal-trend decomposition model.	<a href="#">Meta data</a>

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	Elisa Manetti, Christine Choirat, Antoine Flahault, Guillaume Obozinski			
<a href="#">SGroup-RandomForest</a>	Ajitesh Srivastava, Majd Al Aawar	Srivastava Group	Random Forest ensemble of the predictors generated from the USC-SiKJalpha submission.	<a href="#">Meta data</a>
<a href="#">Statgroup19-richards</a>	Pierfrancesco Alaimo Di Loro, Fabio Divino, Alessio Farcome ni, Giovanna Jona Lasinio, Antonello Maruotti, Marco Mingione, Gianfranco Lovison	Statgroup19	Richards' curve based generalized growth model	<a href="#">Meta data</a>
<a href="#">Statgroup19-spatialrich</a>	Pierfrancesco Alaimo Di Loro,	Statgroup19	Richards' curve based generalized growth model taking into account spatial dependence	<a href="#">Meta data</a>

Model name	Authors	Team	Methods	Complete meta data
<a href="#">ards</a>	Fabio Divino, Alessio Farcome ni, Giovanna Jona Lasinio, Antonello Maruotti, Marco Mingione, Gianfranco Lovison			
<a href="#">UB-BSLCoV</a>	David Moriña	UB	Bayesian synthetic likelihood estimation for underreported non-stationary time series	<a href="#">Meta data</a>
<a href="#">UC3M-EpiGraph</a>	David E. Singh, Miguel Guzman Merino, Maria Cristina Marinescu, Jesus Carretero, Alberto Cascajo Garcia	Universidad Carlos III de Madrid	Agent-based parallel simulator that models individual interactions extracted from social networks and demographical data.	<a href="#">Meta data</a>
<a href="#">ULZF-SEIRC19SI</a>	Janez Zibert	University of Ljubljana, Faculty of Health Sciences Team	SEIHR model extended with compartments for hospitals, intensive care units, asymptomatic cases, separate submodels for vaccinated and unvaccinated, divided to 5 age subgroups of population	<a href="#">Meta data</a>

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<a href="#">UMass-MechBayes</a>	Dan Sheldon, Graham Gibson, Nick Reich	UMass-Amherst	Bayesian compartmental model with observations on cumulative case counts and cumulative deaths. Model is fit independently to each state. Model includes observation noise and a case detection rate.	<a href="#">Meta data</a>
<a href="#">UMass-SemiMech</a>	Dan Sheldon, Graham Gibson, Nick Reich	UMass-Amherst	Bayesian semi-compartmental model with observations on incident case counts and incident deaths. Model is fit independently to each state. Model includes observation noise and a case detection rate.	<a href="#">Meta data</a>
<a href="#">UNED-PreCoV2</a>	José L. Aznarte, César Pérez, José Almagro, Pedro Álvarez, Álvaro Ortiz, Fernando Blat	UNED	Bayesian time series models with ARIMA noise and fixed transfer functions for each input.	<a href="#">Meta data</a>
<a href="#">UNIPV-BayesINGA RCHX</a>	Paolo Giudici, Barbara Tarantino	UNIPV Periscope Working Group	Bayesian estimation of time-dependent models with time-varying coefficients to predict COVID-19 positive counts.	<a href="#">Meta data</a>
<a href="#">UpgUmibU si-MultiBayes</a>	Francesco Bartolucci, Fulvia Pennoni, Antonietta Miras	UNIPG_UNIMIB_UNI_UNINSUBRIA	Bayesian Dirichlet-Multinomial models for counts of patients in mutually exclusive and exhaustive categories such as hospitalized in regular wards and in intensive care units, deceased and recovered	<a href="#">Meta data</a>
<a href="#">USC-SikJalpha</a>	Ajitesh Srivastava, Frost Tianjian	University of Southern California	A heterogeneous infection rate model with human mobility for epidemic modeling. Our model adapts to changing trends and provide	<a href="#">Meta data</a>

Model name	Authors	Team	Methods	Complete meta data
	Xu		predictions of confirmed cases and deaths.	
USyd-OneModel Man	Pablo Montero Manso	University of Sydney Forecast Lab	A single autoregressive model fit jointly to all European time series, adding time series from the top regions across the world. A high-dimensional manifold embedding is used capture the process.	Meta data
UVA-Ensemble	Aniruddha Adiga, Lijing Wang, Srinivasan Venkatramanan, Akhil Sai Peddireddy, Benjamin Hurt, Przemyslaw Porebski, Bryan Lewis, Madhav Marathe, Jiangzhou Chen, Anil Vullikanti	University of Virginia, Biocomplexity COVID-19 Response Team	An ensemble of multiple methods such as auto-regressive (AR)models with exogenous variables, Long short-term memory (LSTM) models,Kalman filter and PatchSim (an SEIR model).	Meta data