

Giulia Pullano, PhD

Mathematical epidemiologist

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I am an interdisciplinary mathematical epidemiologist with a variety of theoretical and computational skills, specializing in infectious disease modeling for disease prevention and control in humans. My focus lies in characterizing the **geographical heterogeneity** in the emergence and spread of **human-to-human diseases** by integrating **behavioral and public health data** through **dynamic modeling frameworks**.

Postdoctoral Fellow

Department of Biology, Georgetown University, Washington, DC, United States of America

Open Science Fellow

Center for Open Science, Charlottesville, VA, United States of America

Education

- **PhD in Epidemiology and Public Health**, specialization in Biomathematics, 2017-2021.
Doctoral school "Pierre Louis de Santé Publique: Epidémiologie et Sciences de l'Information Biomédicale ED393", INSERM, UMR-S 1136, Pierre Louis Institute of Epidemiology and Public Health, Sorbonne Université, Paris, France, and Orange Labs, Sociology and Economics of Networks and Services, Orange, Chatillon, France.
- **MSc in Physics of Complex Systems**, 2014-2016.
University of Turin, Turin, Italy.
- **BSc in Physics**, 2010-2014.
La Sapienza University of Rome, Rome, Italy.

Academic career

- **Postdoctoral fellow**, August 2022-Present.
Department of Biology, Georgetown University, Washington, District of Columbia, United States of America.
- **Postdoctoral researcher**, October 2021-July 2022.
INSERM, UMR-S 1136, Pierre Louis Institute of Epidemiology and Public Health, Sorbonne Université, Paris, France.
- **CIFRE PhD student**, 2017-2021.
Supervision by Dr. Vittoria Colizza, INSERM/Sorbonne Université, and sponsored by Orange, under the supervision of Dr. Stefania Rubrichi within a CIFRE (Conventions Industrielles de Formation par la Recherche) PhD fellowship, 2017-2021.
PhD thesis: "Human mobility and epidemics". The PhD thesis deals with theoretical and applied research work aimed at integrating mobility data into mathematical models for disease prevention and control. I developed new mathematical frameworks to aggregate and integrate mobility data from mobile phone traces into transmission models. While, my applied research work is focused on the COVID-19 pandemic assessment. In the PhD manuscript, I presented two of my PhD research works, in which I analyzed multiple sources of mobility data in different pandemic phases, integrating them into models. In the first work, I used air traffic data

to support European airport screening to prevent international case importations. While in the second one, I used Orange mobile phone data to support the French government to control local transmission and improve the surveillance system in the exit of the first national lockdown (Link: <https://theses.hal.science/tel-04099742>).

Additional training

- NSF & SACNAS Grant Writing and Peer Review Workshop, Miami, Florida, 2023.
 - Open Science training, The Center for Open Science (COS) and Flu Lab, online, 2023.
 - Scientific Evolutionary Writing Workshop, INSERM-Sony Lab, Paris, France, 2019.
 - Speaking in Public Workshop, INSERM, Paris, France, 2019.
 - Training Big Data and PySpark, Orange Labs, Paris, France, 2018.
 - Lake Como School of Advanced Studies in “*Complex Networks: Theory, Methods, and Applications*”, Como, Italy, 2018.
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Awards

- Fritz Family Fellowship, 2024/2025.
 - Opening Influenza Research Fellowship, by the Center of Open Science (<https://www.cos.io/flulab>), December 2022.
 - Award for research works commissioned by the French Senate, ANRS-MIE, France, 2021.
 - Second-best project titled “*Spatial spread of COVID-19 in Senegal and impact of social distancing measures on first wave*”, Orizzonte 2020: Ricerche e Progetti per le Sfide del prossimo Decennio, Paris, 2020.
 - CIFRE (Conventions Industrielles de Formation par la Recherche) PhD fellowship, 2017-2021.
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Publications & preprints

* = Supervised

= Shared lead authorship

Citations: 2921

h-Index: 10

i10-Index: 10

Preprints

- BA García, C Ascione, A Pera, D Stocco, B Wang, E Valdano, **G Pullano***. Disruption of outdoor activities caused by wildfire smoke shapes circulation of respiratory pathogens. *MedRxiv*, 2023.07. 09.23292078. (2023).
- **G Pullano**, LG Alvarez-Zuzek, V Colizza, S Bansal. Characterizing US spatial connectivity: implications for geographical disease dynamics and metapopulation modeling. *MedRxiv*, 2023.11. 22.23298916. (2023).
- B Gutierrez#, L-H Tsu#, **G Pullano**#, M Mazzoli#, Gangavarapu, K., Inward, R, S Busch-Moreno, M A. Suchard, O G. Pybus, A Dunner, R Puentes, S Ayala, J Fernandez, R Araos, L Ferres, V Colizza, M Kraemer. *Under review*. Routes of importation and spatial dynamics of SARS-CoV-2 variants during localised interventions in Chile (2023).

Publications

- CE Sabbatini, **G Pullano**, L Di Domenico, S Rubrichi, S Bansal, V Colizza. The impact of spatial connectivity on NPIs effectiveness. *BMC Infectious Diseases*, in press, 2023.10. 23.23297403. (2023).
- L Di Domenico, CE Sabbatini, **G Pullano**, D Lévy-Bruhl, V Colizza. Impact of January 2021 curfew measures on SARS-CoV-2 B. 1.1. 7 circulation in France. *Eurosurveillance* 26, 2100272 (2021).
- **G Pullano**#, L Di Domenico#, CE Sabbatini, E Valdano, C Turbelin, M Debin, C Guerrisi, C Kengne-Kuetche, C Souty, T Hanslik, T Blanchon, PY Boëlle, J Figoni, S Vaux, C Campèse, S

Bernard-Stoecklin, V Colizza. Underdetection of cases of COVID-19 in France threatens epidemic control. *Nature* 590, 134–139 (2021).

- L Di Domenico, **G Pullano**, CE Sabbatini, P-Y Boelle, V Colizza. Modelling safe protocols for reopening schools during the COVID-19 pandemic in France. *Nature Communications* 11, 5110 (2021).
 - **G Pullano**[#], E Valdano[#], N Scarpa, S Rubrichi, V Colizza. Evaluating the effect of demographic factors, socioeconomic factors, and risk aversion on mobility during the COVID-19 epidemic in France under lockdown: a population-based study. *The Lancet Digital Health* 2, E638-E649 (2020).
 - L Di Domenico, **G Pullano**, CE Sabbatini, P-Y Boëlle, V Colizza. Impact of lockdown on COVID-19 epidemic in Île-de-France and possible exit strategies. *BMC Medicine* 18, 240 (2020).
 - F Pinotti, L Di Domenico, E Ortega, M Mancastroppa, **G Pullano**, E Valdano, P-Y Boelle, C Poletto, V Colizza. Tracing and analysis of 288 early SARS-CoV-2 infections outside China: A modeling study. *PLOS Medicine* 17, e1003193 (2020).
 - M Gilbert, **G Pullano**, F Pinotti, E Valdano, C Poletto, PY Boelle, E D'Ortenzio, Y Yazdanpanah, SP Eholie, M Altmann, B Gutierrez, M U. G. Kraemer, V Colizza. Preparedness and vulnerability of African countries against importations of COVID-19: a modelling study. *The Lancet* 395, 871-877 (2020).
 - **G Pullano**, F Pinotti, E Valdano, P-Y Boëlle, C Poletto, V Colizza. Novel coronavirus (2019-nCoV) early-stage importation risk to Europe, January 2020. *Eurosurveillance* 25, 2000057 (2020).
 - B Monechi, **G Pullano**, Vittorio Loreto. Efficient team structures in an open-ended cooperative creativity experiment. *PNAS* 116 (44) 22088-22093 (2019).
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Selected invited lectures and seminars

- Characterizing US spatial connectivity during the early phase of the COVID pandemic: implications for metapopulation modeling, Invited Seminar, University of Oxford, May 2024.
 - Characterizing US spatial connectivity during the early phase of the COVID pandemic: implications for metapopulation modeling, American Mathematical Society (AMS) 2024 Spring Eastern Sectional Meeting, Howard University, April 2024.
 - Characterizing US spatial connectivity during the early phase of the COVID pandemic: implications for metapopulation modeling, MathBio Seminar, Virginia Tech, Blacksburg, VA, USA, January 2023.
 - Characterizing US spatial connectivity during the early phase of the COVID pandemic: implications for metapopulation modeling, 17th Annual Symposium on BEER (Biomathematics and Ecology Education Research), Richmond, USA, November 2023.
 - Encouraging the Adoption of Open Science Practices Across Research Communities, Georgetown University, June 2023.
 - Integration of high-resolution mobility data into mathematical models for public health applications, Mathematical Biology Seminar, University of Maryland, MD, USA, 2023.
 - Multi-source data and epidemic modeling to fight COVID-19 epidemic. MIX-NEXT 2021 Satellite, *The Conference of Complex System (CCS)*, Lyon, France, October 2021.
 - Multi-source data and transmission models to fight COVID-19 epidemic in France. *Italian Society of Statistical Physics (SIFS)*, Young Seminar, online, June 2021.
 - Mobility definition and resolution needed to inform predictive epidemic models for spatial transmission from mobile phone data. Workshop in “*Human mobility: from big data to applications*”, University of Havana, Havana, Cuba, November 2019.
 - Coupling matrices extracted from individual trajectories based on mobile phone data. Seminar at Technische Universität, Berlin, Germany, May 2018.
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Contributed Presentations

- Characterizing US spatial connectivity: implications for geographical disease dynamics and metapopulation modeling, *EPIDEMICS9 Conference*, Bologna, Italy, December 2023.
 - Characterizing US spatial connectivity during the early phase of the COVID pandemic: implications for metapopulation modeling, *MIDAS (Models of Infectious Disease Agent Study) Annual Conference*, Atlanta, USA, October 2023.
 - Characterizing US spatial connectivity: implications for geographical disease dynamics and metapopulation modeling, *Netsci Conference*, Wien, Austria, December 2023.
 - Underdetection of cases of COVID-19 in France threatens epidemic control, *BIFI International Conference "The Science of Covid-19: From molecular drug design to data-driven epidemiological models"*, Zaragoza, Spain, June 2022.
 - Extracting meaningful mobility flows from mobile phone individual trajectory data for epidemic metapopulation models, *NetSci2020 Conference*, Rome, Italy, September 2020.
 - Extracting meaningful mobility flows from mobile phone individual trajectory data for epidemic metapopulation models, *NetMob2019 Conference*, Oxford, UK, July 2019.
 - Efficient team structures in an open-ended cooperative creativity experiment, *Kreyon Conference*, Rome, 2017.
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Selected press coverage

- En France, la sous-détection des cas de Covid-19 limite la capacité à contrôler l'épidémie. Interviewed by *The Conversation*. 23 December 2020.
 - Pourquoi les données téléphoniques aident à comprendre la pandémie de Covid-19. *Le Monde*. 27 mars 2020.
 - Coronavirus : le télétravail et les fermetures scolaires pourrait abaisser le pic épidémique de près de 40 %. *Le Monde*, 16 March 2020.
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Involvement in the scientific community

- Creator and organizer of the yearly satellite meeting EPIMOB at Netsci Conference in July 11 2022, 11 July 2023.
 - Organizer of the yearly workshop Complexity72h, from 2023.
 - CCS (Complex System Society) Scientific Committee, from 2022.
 - MIDAS (Models of Infectious Disease Agents Study) Scientific Committee, from 2023.
 - Complex Network Scientific Committee, from 2023.
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Peer review service

- PNAS, Royal Society Interface, Royal Society Open Science, PLOS Computational Biology, PLOS Digital Health, PLOS One, Health and Place, EPJ Data Science.
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