

GoTriple / Improving Discovery and Collaboration in Open Science 02.02.2023

Modeling epidemics:

challenges when integrating social and behavioral factors to disease models

Sarah Kada, PhD

sarah.kada@geomatys.com

COVID-19 pandemic

The NEW ENGLAND JOURNAL of MEDICINE

BRIEF REPORT

A Novel Coronavirus from Patients with Pneumonia in China, 2019

Na Zhu, Ph.D.,
Bo Yang, M.S.,
Weifeng Shi, I
Xuejun Ma, P
George F. G

The NEW ENGLAND
JOURNAL of MEDICINE

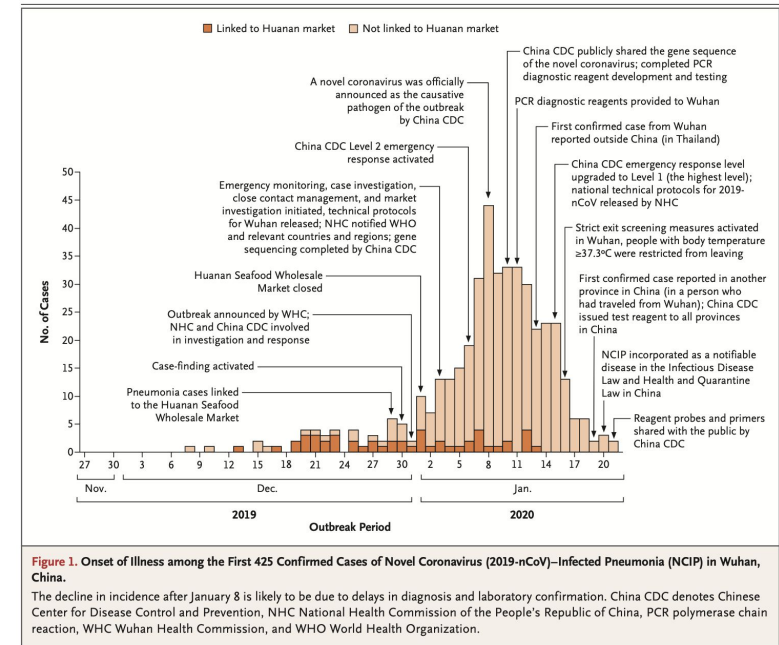
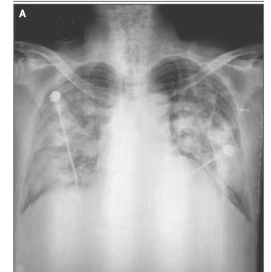
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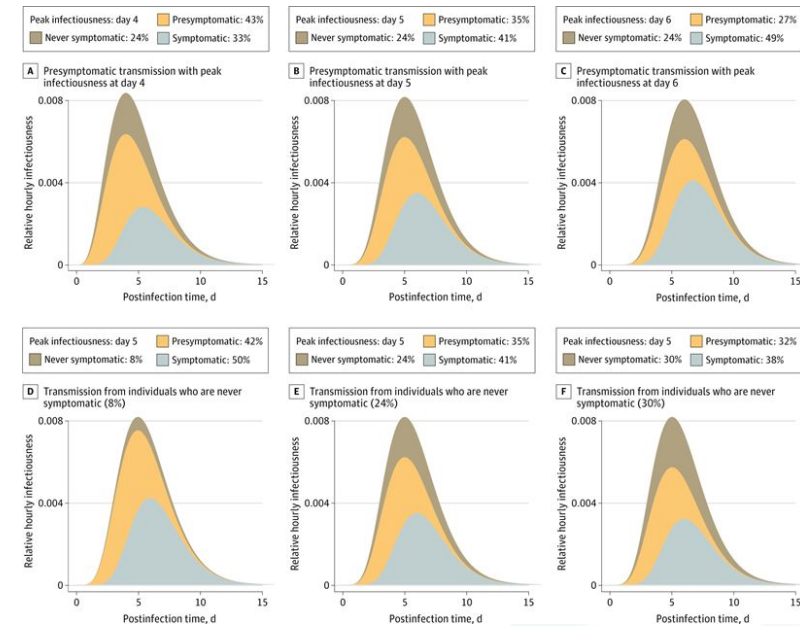
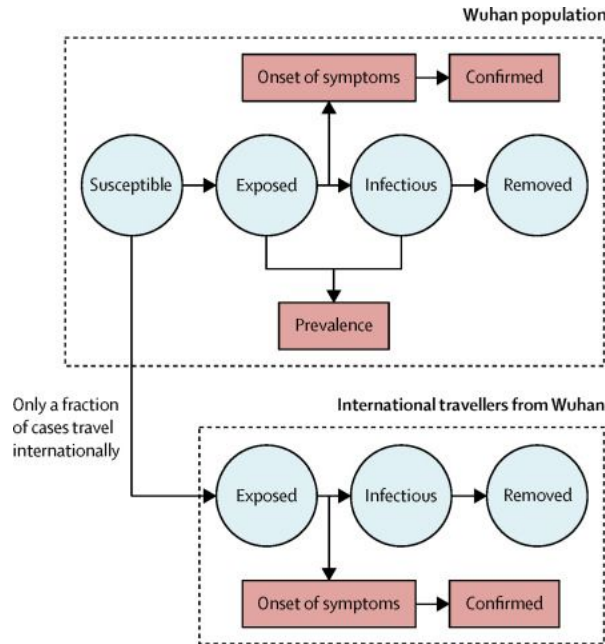
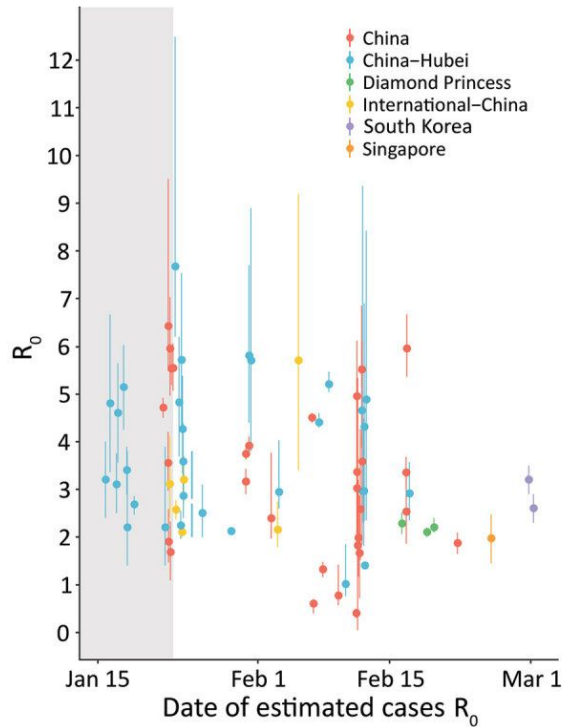
Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia

Qun Li, M.Med., Xuhua Guan, Ph.D., Peng Wu, Ph.D., Xiaoye Wang, M.P.H., Lei Zhou, M.Med., Yeqing Tong, Ph.D., Ruiqi Ren, M.Med., Kathy S.M. Leung, Ph.D., Eric H.Y. Lau, Ph.D., Jessica Y. Wong, Ph.D., Xuesen Xing, Ph.D., Nijuan Xiang, M.Med., Yang Wu, M.Sc., Chao Li, M.P.H., Qi Chen, M.Sc., Dan Li, M.P.H., Tian Liu, B.Med., Jing Zhao, M.Sc., Man Liu, M.Sc., Wenxiao Tu, M.Med., Chuding Chen, M.Sc., Lianmei Jin, M.Med., Rui Yang, M.Med., Qi Wang, M.P.H., Suhua Zhou, M.Med., Rui Wang, M.D., Hui Liu, M.Med., Yinbo Luo, M.Sc., Yuan Liu, M.Med., Ge Shao, B.Med., Huan Li, M.P.H., Zhongfa Tao, M.P.H., Yang Yang, M.Med., Zhiqiang Deng, M.Med., Boxi Liu, M.P.H., Zhitao Ma, M.Med., Yanping Zhang, M.Med., Guoqing Shi, M.P.H., Tommy T.Y. Lam, Ph.D., Joseph T. Wu, Ph.D., George F. Gao, D.Phil., Benjamin J. Cowling, Ph.D., Bo Yang, M.Sc., Gabriel M. Leung, M.D., and Zijian Feng, M.Med.



Modeling the COVID-19 pandemic

When epidemics start, we need to estimate key parameters

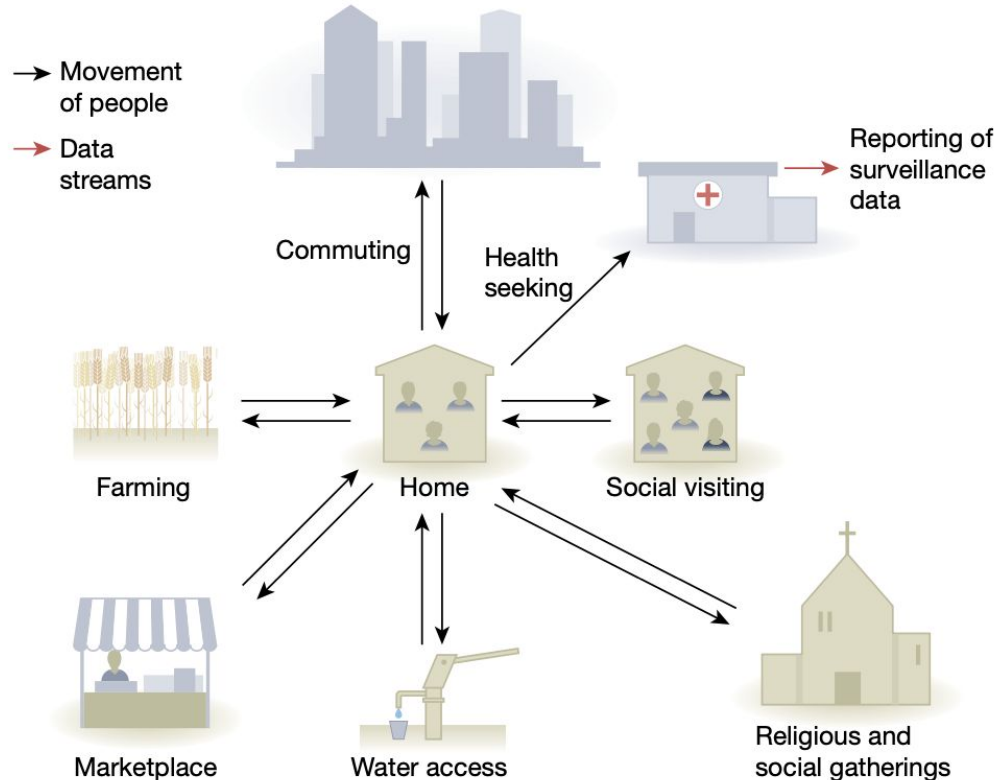


Modeling the COVID-19 pandemic

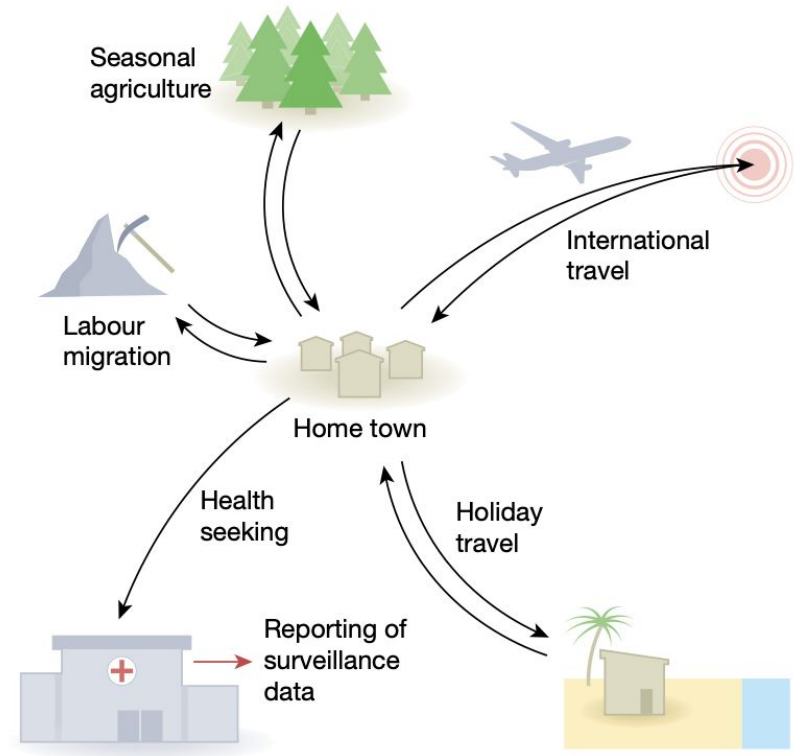


SSH in disease modeling: why and how?

a Local transmission



b Seasonal and long-distance transmission

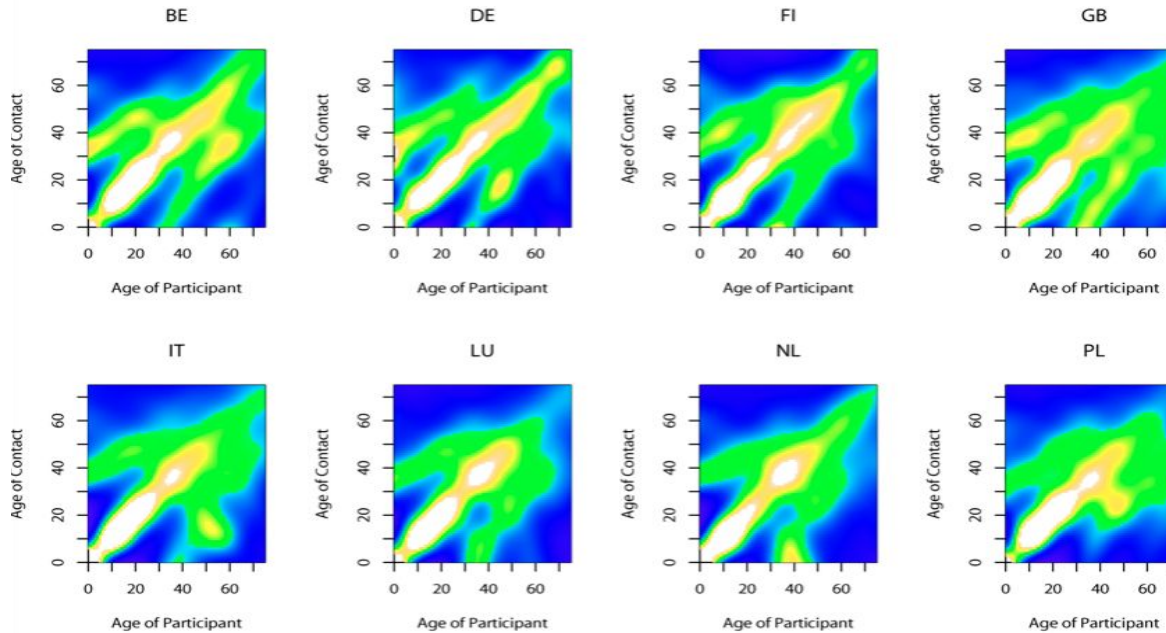


Social contacts

OPEN ACCESS Freely available online

PLoS MEDICINE

Social Contacts and Mixing Patterns Relevant to the Spread of Infectious Diseases

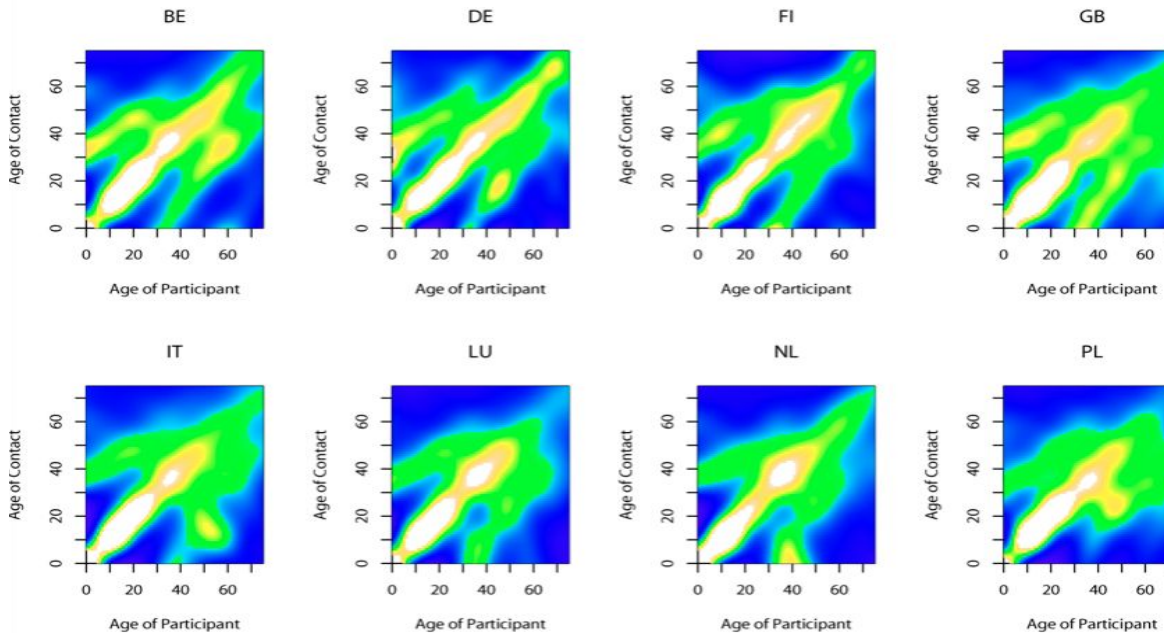


Social contacts

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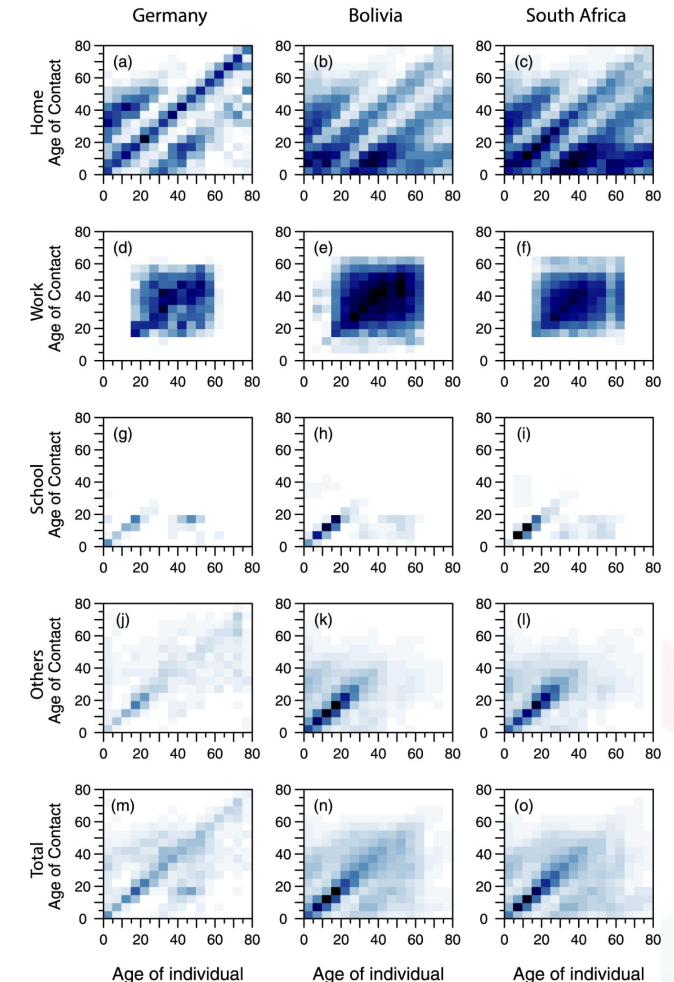
Social Contacts and Mixing Patterns Relevant to the Spread of Infectious Diseases



RESEARCH ARTICLE

Projecting social contact matrices in 152 countries using contact surveys and demographic data

Kiesha Prem¹, Alex R. Cook^{1,2,3*}, Mark Jit^{4,5}



Non pharmaceutical interventions

How to measure impact of NPIs and include behaviors?

Data for Good À propos Outils et données Impact Visualisations S'impliquer

COVID Behaviors Dashboard

Mental Wellness Data from the COVID-19 Trends and Impacts Survey
April 26, 2022, 9:30 EST/2:30 PM GMT

COVID-19 Trends and Impact Survey

COVID Behaviors Dashboard Webinar: What are people around the globe reporting on mental wellness?

[Read More](#)

COVID-19 Trends and Impact Survey

Fort Worth SPARC Uses COVID-19 Trends and Impact Survey Data to Increase Youth COVID-19 Testing and Vaccinations across Northern Texas

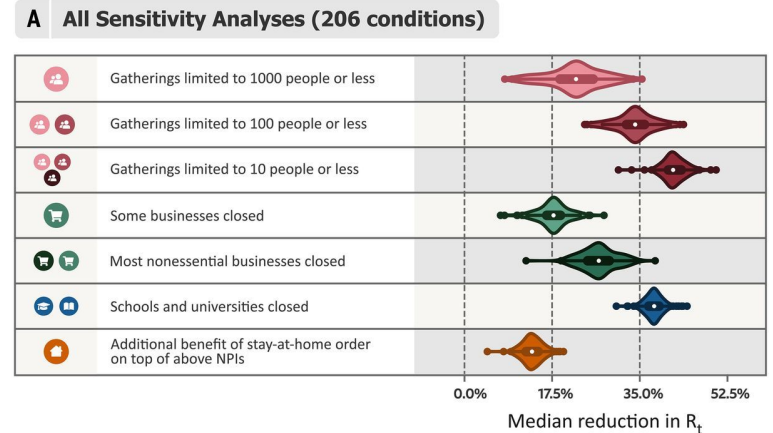
[Read More](#)

COVID-19 Trends and Impact Survey

The US COVID-19 Trends and Impact Survey: Continuous real-time measurement of COVID-19 symptoms, risks, protective behaviors, testing, and vaccination

[Read More](#)

Sore Throat
Nausea
Stuffy or Runny Nose
Male > 54 yr
Female 18-54 yr
Female > 54 yr
Difficulty Breathing
Headache
Male 18-54 yr
Eye Pain
Aches or Muscle Pain
Fatigue
Throat Pain



Vaccine adherence

Key to plan vaccination

Am. J. Trop. Med. Hyg., 107(2), 2022, pp. 268-277
doi:10.4269/ajtmh.22-0132
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COVID-19 Vaccination Intention in a Community Cohort in Ponce, Puerto Rico

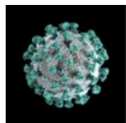
Liliana Sánchez-González,¹*† Chelsea G. Major,¹† Dania M. Rodríguez,¹ Abirami Balajee,² Kyle R. Ryff,¹ Olga Lorenzi,¹ Mariely Linares,³ Laura E. Adams,¹ Vanessa Rivera-Amill,³ Melissa Rolles,² and Gabriela Paz-Bailey¹

¹Dengue Branch, Centers for Disease Control and Prevention, San Juan, Puerto Rico; ²COVID-19 Emergency Response Team, Centers for Disease Control and Prevention, Atlanta, Georgia; ³Department of Basic Sciences, Ponce Health Sciences University, Ponce, Puerto Rico

Abstract. / Rico (PR). We study, a comm We used univa 1,542 respond pants (83%) re concern about interview date, ception, influer with minors (< children, we o COVID-19 vac addresses CO



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SPECIAL SERIES
The Coronavirus Crisis

Why Puerto Rico leads the U.S. in COVID vaccine rate — and what states can learn

October 27, 2021 · 10:56 AM ET



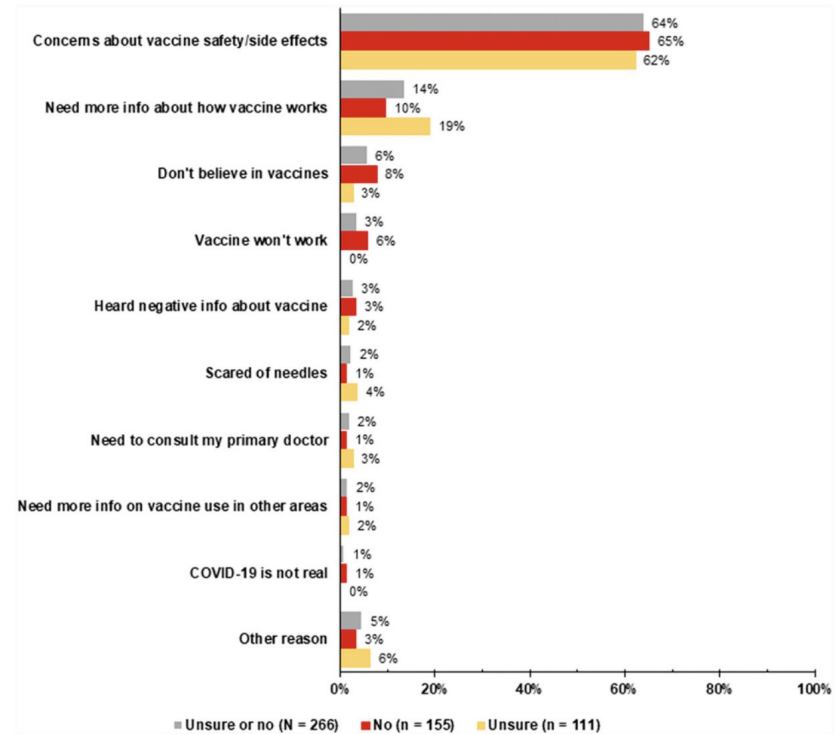
PATRICK JARENWATTANANON



AYEN BIOR



SARAH HANDEL



Some ideas for a way forward

Integration of SSH data will require:

Deconstructing academic expectations:

- Metrics (published papers, grants awarded)
- Create hybrid journals
- Need for new funding specific to transdisciplinary research and applications

Translational Science (for disease modeling and beyond) :

- Incorporate local social phenomena (see talk on accessibility and equity of SSH data)
- Open dialogue between experts in Academia, Research centers and gov.
- Training/awareness in both disciplines
- Generalization shouldn't be the only goal, specific social context can give great insights



Thank you

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Non pharmaceutical interventions

How to measure impact of NPIs and include behaviors?

