

Jeffrey Shaman
Curriculum Vitae

Department of Environmental Health Sciences
Mailman School of Public Health, Columbia University
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AREAS OF INTEREST: Infectious disease epidemiology, mosquito-borne disease, respiratory disease, mosquito ecology, modeling and prediction of infectious disease, climate and health, large-scale climate dynamics

EDUCATION:

University of Pennsylvania, Bachelor of Arts in Biology, *Cum Laude* with honors in the major, 1990
Columbia University, Master of Arts, Department of Earth and Environmental Sciences, 2000
Columbia University, Master of Philosophy, Department of Earth and Environmental Sciences, 2002
Columbia University, Doctor of Philosophy, Department of Earth and Environmental Sciences, 2003, Awarded with Distinction
Harvard University, National Oceanic and Atmospheric Administration Post-Doctoral Fellow in Climate and Global Change, 2003-2005

APPOINTMENTS:

Professor of Environmental Health Sciences, Mailman School of Public Health, Columbia University, 2019-present
Professor of Climate, Columbia Climate School, Columbia University, 2022-present
Senior Associate Dean for Faculty Affairs, Columbia Climate School, Columbia University, 2021-present
Director, Climate and Health Program, Mailman School of Public Health, Columbia University, 2017-present
Director, Global Consortium for Climate and Health Education, Mailman School of Public Health, Columbia University, 2017-2020
Associate Professor, Department of Environmental Health Sciences, Mailman School of Public Health, Columbia University, 2014-2018
Co-Director, Climate and Health Program, Mailman School of Public Health, Columbia University, 2014-2016
Assistant Professor, Department of Environmental Health Sciences, Mailman School of Public Health, Columbia University, 2011-2014
Assistant Professor, College of Oceanic and Atmospheric Sciences, Oregon State University, 2005-2011
National Oceanic and Atmospheric Administration Post-Doctoral Fellow, Harvard University, 2003-2005
National Aeronautics and Space Administration Earth System Science Fellow (graduate), 2000-2003
Laboratory Technician, Children's Hospital of Philadelphia and the University of Pennsylvania. Immunological research involving molecular and cellular experimentation investigating the class II system and its genetic expression, 1992-1994
Field Researcher, The University of Pennsylvania. Plant biology surveys, experimentation and research of forest regrowth and plant community competition, 1990-1991

AFFILIATIONS:

Chair, Earth Institute Faculty, Columbia University, 2021-present
Earth Institute, Columbia University, Faculty Member, 2020-present
Data Science Institute, Columbia University, Affiliate Member, 2017-present
Columbia Center for Environmental Health in Northern Manhattan, Mailman School of Public Health, Columbia University, 2011-present
International Research Institute for Climate and Society, Columbia University, 2011-present
American Museum of Natural History, Division of Invertebrate Zoology, Research Associate, 2016-2021
Associate Chair, Earth Institute Faculty, Columbia University, 2020-2021
Earth Institute, Columbia University, Associate Faculty Member, 2016-2020
Earth Institute, Columbia University, Junior Faculty Fellow, 2012-2016
Institute for Social and Economic Research and Policy, Columbia University, Faculty Fellow, 2012-2018
College of Earth, Oceanic and Atmospheric Sciences, Oregon State University, Courtesy, 2011-2014

Center for Communicable Disease Dynamics, Harvard School of Public Health, 2009-2015

GRADUATE AND POSTDOCTORAL ADVISORS:

Mark A. Cane, Columbia University (graduate)
Eli Tziperman, Harvard University (post-doctoral)

HONORS:

- Humanitarian Award, Business Networking International, 2021
Distinguished Service Award, New York City Department of Health and Mental Hygiene, Excellence in Response Team Award, Academic Partners Supporting COVID-19 ICS Surveillance and Epidemiology Activities, (Columbia University Modeling Team), 2021
Finalist, 2020 AAAS Newcomb Cleveland Prize (for Li et al. 2020), 2021
Dean's Excellence in Faculty Leadership Award, Mailman School of Public Health, 2020 International Society for Disease Surveillance Outstanding Research Article in Biosurveillance in the Scientific Achievement Category, first prize (for Pei et al., 2018), 2018
Tow Faculty Leadership Award, Mailman School of Public Health, 2015-2018
Winner, Centers for Disease Control and Prevention 'Predict the Influenza Season Challenge', 2014
International Society for Disease Surveillance Outstanding Research Article in Biosurveillance in the Scientific Achievement Category, first prize (for Shaman and Karspeck, 2012), 2013
Junior Faculty Career Development Award, Columbia University Center for Environmental Health in Northern Manhattan, 2012-2014
National Oceanic and Atmospheric Administration Post-Doctoral Fellowship in Climate and Global Change, 2003-2005
Bruce C. Heezen Prize for graduate students making exceptional scientific contributions, 2003
Columbia Sigma Xi, 2003
Ph.D. Awarded with Distinction, 2003
NASA Earth System Science Fellowship, 2000-2003

PEER REVIEWED PUBLICATIONS:

- Yang W, Shaman J. COVID-19 pandemic dynamics in South Africa and epidemiological characteristics of three variants of concern (Beta, Delta, and Omicron). *eLife*, **11**:e78933, doi:10.7554/eLife.78933, 2022.
- Truelove S,...Galanti M, Yamana TK, Pei S, Shaman J...Viboud C. Projected resurgence of COVID-19 in the United States in July-December 2021 resulting from the increased transmissibility of the Delta variant and faltering vaccination. *eLife*, **11**:e73584, doi:10.7554/eLife.73584, 2022.
- Schneider T, Dunbar ORA, Wu J, Boettcher L, Burov D, Garbuno-Inigo A, Wagner GL, Pei S, Daraio C, Ferrari R, Shaman J, Epidemic management and control through individual risk-tailored contact interventions. *PLOS Computational Biology*, **18(6)**:e1010171, doi:10.1371/journal.pcbi.1010171, 2022.
- Lynch VD, Shaman J. The effect of seasonal and extreme floods on hospitalizations for Legionnaires' disease in the United States, 2000-2011. *BMC Infectious Diseases*, **22**:550, doi:10.1186/s12879-022-07489-x, 2022.
- Yang W, Shaman J. COVID-19 pandemic dynamics in India, the SARS-CoV-2 Delta variant and implications for vaccination. *Journal of the Royal Society Interface*, **19(19)**:20210900, doi:10.1098/rsif.2021.0900, 2022.
- Ukawuba I, Shaman J. Inference and dynamic simulation of malaria using a simple climate-driven entomological model of malaria transmission. *PLOS Computational Biology*, **18(6)**:e1010161, doi:10.1371/journal.pcbi.1010161, 2022.
- Lewandowski SA, Shaman JL. Heat stress morbidity among United States military personnel: daily exposure and lagged response (1998-2019). *International Journal of Biometeorology*, **66(6)**:1199-1208, doi:10.1007/s00484-022-02269-3, 2022. **Correction:** *66(6)*:1209-1217, doi:10.1007/s00484-022-02291-5, 2022.
- Cramer EY,...Yamana TKY, Pei S, Shaman J,...Reich NG. Evaluation of individual and ensemble probabilistic forecasts of COVID-19 mortality in the US. *Proceedings of the National Academy of Sciences*, **119(15)**:e2113561119, doi:10.1073/pnas.2113561119, 2022.
- Keyes KM, Shaman J. Contagion and psychiatric disorders: the social epidemiology of risk (Comment on "The Epidemic of Mental Disorders in Business"). *Administrative Science Quarterly*, **67(1)**:49-55, doi:10.1177/00018392211067693, 2022.
- Yang W, Shaman J. Viral replication dynamics could critically modulate vaccine effectiveness and should be accounted for when assessing new SARS-CoV-2 variants. *Influenza and Other Respiratory Viruses*, **16(2)**:366-367, doi:10.1111/irv.12961, 2022.

- Kannoth, S, Kandula S, Shaman J. The association between early country-level testing capacity and later COVID-19 mortality outcomes. *Influenza and Other Respiratory Viruses*, **16**(1):56-62, doi:10.1111/irv.12906, 2022.
- Gimbrone C, Rutherford C, Kandula S, Martinez-Ales G, Shaman J, Olson M, Gould MS, Pei S, Galanti M, Keyes KM. The effects of COVID-19 mobility restrictions on economic, mental health, and suicide-related concerns in the US using cellular phone GPS and Google search volume data. *PLOS ONE*, **16**(12):e0260931, doi:10.1371/journal/pone.0260931, 2021.
- Lieberman-Cribbin W, Galanti M, Shaman J. Socioeconomic disparities in SARS-CoV-2 serological testing and positivities in New York City. *Open Forum Infectious Diseases*, **8**(12):ofab534, doi:10.1093/ofid/ofab534, 2021.
- Martinez-Ales G, Gimbrone C, Rutherford C, Kandula S, Olson M, Gould MS, Shaman J, Keyes KM. Role of firearm ownership on 2001-2016 trends in U.S. firearm suicide rates. *American Journal of Preventive Medicine*, **61**(6):795-803, doi:10.1016/j.amepre.2021.05.026, 2021.
- Qi Y, Shaman J, Pei S. Quantifying the effects of COVID-19 non-pharmaceutical interventions on influenza transmission in the United States. *The Journal of Infectious Diseases*, **224**(9):1500-1508, doi:10.1093/infdis/jiab485, 2021.
- Galanti M, Pei S, Yamana TK, Angel FJ, Charos A, Khan F, Shea KM, Swerdlow DL, Shaman J. Non-pharmaceutical interventions and inoculation rate shape SARS-CoV-2 vaccination campaign success. *Epidemiology & Infection*, **149**:e222, doi:10.1017/S095026882100217X, 2021.
- Pei S, Yamana TK, Kandula S, Galanti M, Shaman J. Burden and characteristics of COVID-19 in the United States during 2020. *Nature*, **598**:338-341, doi:10.1038/s41586-021-03914-4, 2021.
- Yang W, Shaman J. Development of a model-inference system for estimating epidemiological characteristics of SARS-CoV-2 variants of concern. *Nature Communications*, **12**:5573, doi:10.1038/s41467-021-25913-9, 2021.
- Pei S, Liljeros F, Shaman J. Identifying asymptomatic spreaders of antimicrobial-resistant pathogens in hospital settings. *Proceedings of the National Academy of Sciences*, **118**(37):e2111190118, doi:10.1073/pnas.2111190118, 2021.
- Kandula S, Shaman J. Association between COVID-19 mortality and population level health and socioeconomic indicators. *PLOS Medicine*, **18**(7):e1003693, doi:10.1371/journal.pmed.1003693, 2021.
- Ma, Y. S, Pei, J. Shaman, R. Dubrow and K. Chen. Role of air temperature and humidity in the transmission of SARS-CoV-2 in the United States. *Nature Communications*, **12**:3602, doi:10.1038/s41467-021-23866-7, 2021.
- Martinez-Ales G, Pamplin II, JR, Rutherford C, Gimbrone C, Kandula S, Olson M, Gould MS, Shaman J, Keyes KM. Age, period, and cohort effects on suicide death in the US from 1999 to 2017: moderation by sex, race, and firearm involvement. *Molecular Psychiatry*, doi:10.1038/s41380-021-01078-1, 2021.
- Zebrowski A, Rundle A, Pei S, Yang W, Carr BG, Sims S, Zebrowski A, Doorley R, Schluger N, Quinn JW, Shaman J, Branas CC. A spatiotemporal tool to project hospital critical care capacity and mortality from COVID-19 in US counties. *American Journal of Public Health*, **111**:1113-1122, doi:10.2105/AJPH.2021.306220, 2021.
- Keyes KM, Kandula S, Olfson M, Gould MS, Martinez-Ales G, Rutherford C, Shaman J. Suicide and the agent-host-environment triad: leveraging surveillance sources to inform prevention. *Psychological Medicine*, **51**(4):529-537, doi:10.1017/S003329172000536X, 2021.
- Yang W, Shiff J, Shaman J. COVID-19 transmission dynamics and effectiveness of public health interventions in New York City during the 2020 spring pandemic wave. *Journal of the Royal Society Interface*, **18**(175):20200822, doi:10.1098/rsif.2020.0822, 2021.
- Lamb MR, Kandula S, Shaman J. Differential COVID-19 case positivity in New York City neighborhoods: socioeconomic factors and mobility. *Influenza and Other Respiratory Viruses*, **15**(2):209-217, doi:10.1111/irv.12816, 2021.
- Rader B, White LF, Burns MR, Chen J, Brilliant J, Cohen J, Shaman J, Brilliant L, Kraemer, MUG, Hawkins J, Scarpino SV, Astley CM, Brownstein JS. Mask wearing and control of SARS-CoV-2 transmission in the United States. *Lancet Digital Health*, **3**(3):e148-e157, doi:10.1016/S2589-7500(20)30293-4, 2021.
- Galanti M, Shaman J. Direct observation of multiple subsequent infections with endemic coronaviruses. *The Journal of Infectious Diseases*, **233**(3):409-415, doi:10.1093/infdis/jiaa392, 2021..
- Yang W, Kandula S, Huynh M, Greene SK, Van Wye G, Li W, Chan HT, McGibbon E, Yeung A, Olson D, Fine A, Shaman J. Estimating the infection fatality risk of COVID-19 in New York City during the spring 2020 pandemic wave: a model-based analysis. *Lancet Infectious Diseases* **21**(2):203-212, doi:10.1016/S1473-3099(20)30769-6, 2021.
- Pei S, Teng X, Lewis P, Shaman J. Optimizing influenza surveillance networks using uncertainty propagation. *Nature Communications*, **12**:222, doi:10.1038/s41467-020-20399-3, 2021.
- Matienzo N, Youssef MM, Comito D, Lane B, Ligon C, Morita H, Winchester A, Decker ME, Dayan P, Shopsin B, Shaman J. Respiratory viruses in pediatric emergency department patients and their family members. *Influenza and Other Respiratory Viruses*, **15**(1):91-98, doi:10.1111/irv.12789, 2021.
- Pei S, Kandula S, Shaman J. Differential Effects of Intervention Timing on COVID-19 Spread in the United States. *Science Advances*, **6**(49):eabd6370, doi:10.1126/sciadv.abd6370, 2020.
- Pei S, Dahl K, Yamana TK, Licker R, Shaman J. Compound risks of hurricane evacuation amid the COVID-19 pandemic in the United States. *GeoHealth*, **4**(12):e2020GH000319, doi:10.1029/2020GH000319, 2020.

- Cruz AT, Shaman J, Dayan P. The challenge of clearly counting COVID-19 cases in children. *Pediatrics*, **146(6)**:e2020031682, doi:10.1542/peds.2020-027425, 2020.
- Bomfim R, Pei S, Shaman J, Yamana T, Makse HA, Andrade Jr. JS, Lima Neto AS, Furtado V. Predicting dengue outbreaks at neighborhood level using human mobility in urban areas. *Journal of the Royal Society Interface*, **17(171)**:20200691, doi:10.1098/rsif.2020.0691, 2020..
- Shaman J, Galanti M. Will SARS-CoV-2 become endemic? *Science*, **370(6516)**:527-529, doi:10.1126/science.abe5960, 2020.
- Kramer SC, Pei S, Shaman J. Forecasting influenza in Europe using a metapopulation model incorporating cross-border commuting and air travel. *PLOS Computational Biology*, **16(10)**:e1008233, doi:10.1371/journal.pcbi.1008233, 2020.
- Pei S, Shaman J. Aggregating forecasts of multiple respiratory pathogens supports more accurate forecasting of influenza-like illness. *PLOS Computational Biology*, **16(10)**:e1008301, doi:10.1371/journal.pcbi.1008301, 2020.
- Galanti M, Comito D, Ligon C, Lane B, Matienzo N, Ibrahim S, Shittu A, Tagne E, Birger R, Ud-Dean M, Filip I, Morita H, Rabadian R, Anthony S, Freyer GA, Dayan P, Shopsin B, Shaman J. Active surveillance documents rates of clinical care seeking due to respiratory illness. *Influenza and Other Respiratory Viruses*, **14(5)**:499-506, doi:10.1111/irv.12753, 2020.
- Emeruwa UN, Ona S, Shaman J, Turitz A, Wright JD, Gyamfi-Bannerman C, Melamed A. Associations between built environment, neighborhood socioeconomic status and SARS-CoV-2 infection among pregnant women in New York City. *JAMA*, **324(4)**:390-392, doi:10.1001/jama.2020.11370, 2020.
- Shea B, Knowlton K, Shaman J. The state of climate-health education at health professions schools: a baseline assessment. *JAMA Open Network*, **3(5)**:e206609, doi:10.1001/jamanetworkopen.2020.6609, 2020.
- Li R, Pei S, Chen B, Song Y, Zhang T, Yang W, Shaman J. Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2). *Science*, **368(6490)**:489-493, doi:10.1126/science.abb3221, 2020.
- Gervais M, Shaman J, Kushnir Y. Impact of the North Atlantic Warming Hole on sensible weather. *Journal of Climate*, **33(10)**:4255-4271, doi:10.1175/JCLI-D-1909636.1, 2020.
- Heaney A, Alexander K, Shaman J. Ensemble forecast and parameter inference of childhood diarrhea in Chobe District, Botswana. *Epidemics*, **30**:100372, doi:10.1016/j.epidem.2019.100372, 2020.
- Yamana TK, Shaman J. A framework for evaluating the effects of observational type and quality on vector-borne disease forecast. *Epidemics*, **30**:100359, doi:10.1016/j.epidem.2019.100359, 2020.
- Krasna H, Czabanowska K, Jiang S, Khadka S, Morita H, Kornfeld J, Shaman J. The future of careers at the intersection of climate change and public health: What can job postings and an employer survey tell us? *International Journal of Environmental Research and Public Health*, **17(4)**:1310, doi:10.3390/ijerph170418310, 2020.
- Orenbuch R, Filip I, Comito D, Shaman J, Pe'er I, Rabadian R. arcasHLA: high resolution HLA typing from RNAseq. *Bioinformatics*, **36(1)**:33-40, doi:10.1093/bioinformatics/btz474, 2020.
- Heaney A, Shaman J, Alexander K. El Nino-Southern Oscillation and under-5 diarrhea in Botswana. *Nature Communications*, **10**:5798, doi:10.1038/s41467-019-13584-6, 2019.
- Reich NG, McGowan C, Yamana T, Tushar A, Ray E, Osthuis D, Kandula S, Fox S, Brooks L, Crawford-Crudell W, Gibson GC, Moore E, Silva R, Biggerstaff M, Johansson MA, Rosenfeld R, Shaman J. A collaborative multi-model ensemble for real-time influenza forecasting in the U.S.: Results from the 2017/2018 season. *PLOS Computational Biology*, **15(11)**:e1007486, doi:10.1371/journal.pcbi.1007486, 2019.
- Johansson M et al. Advancing probabilistic epidemic forecasting through an open challenge: The Dengue Forecasting Project. *Proceedings of the National Academy of Sciences*, **116(48)**:24268-24274, doi:10.1073/pnas.1909865116, 2019.
- Sy KTL, Shaman J, Kandula S, Pei S, Gould M, Keyes KM. Spatiotemporal clustering of suicide deaths from 1999 to 2016: a spatial epidemiological approach. *Social Psychiatry and Psychiatric Epidemiology*, **54**:1471-1482, doi:10.1007/s00127-019001736-4, 2019.
- Lipsitch M, Shaman J. Comment on: ‘Antibiotic footprint’ as a communication tool to aid reduction of antibiotic consumption. *Journal of Antimicrobial Chemotherapy*, **74(11)**:3404-3406, doi:10.1093/jac/dkz320, 2019..
- Reich NG, Osthuis D, Ray E, Yamana T, Biggerstaff M, Johansson MA, Rosenfeld R, Shaman J. Reply to Bracher: Scoring probabilistic forecasts to maximize public health interpretability. *Proceedings of the National Academy of Sciences*, **116(42)**:20811-20812, doi:10.1073/pnas.1912694116, 2019.
- Kandula S, Shaman J. Reappraising the utility of Google Flu Trends. *PLOS Computational Biology*, **15(8)**:e1007258, doi:10.1371/journal.pcbi.1007258, 2019.
- Kandula S, Pei S, Shaman J. Improved forecasts of influenza-associated hospitalization rates with Google search trends. *Journal of the Royal Society Interface*, **16**:20190080, doi:10.1098/rsif.2019.0080, 2019.
- Kandula S, Shaman J. Near-term forecasts of influenza-like illness: an evaluation of autoregressive time series approaches. *Epidemics*, **27**:41-51, doi:10.1016/j.epidem.2019.01.002, 2019.
- Li X, Xu B, Shaman J. The impact of environmental transmission and epidemiological features on the geographical translocation of highly pathogenic avian influenza virus. *International Journal of Environmental Research and Public Health*, **16(11)**:1890, doi:10.3390/ijerph16111890, 2019.
- Li X, Xu B, Shaman J. Pathobiological features that favor the intercontinental dissemination of highly pathogenic avian influenza virus H5N8. *Royal Society Open*, **6**:190276, doi:10.1098/rsos.190276, 2019.

- Gervais M, Shaman J, Kushnir Y. Impacts of the North Atlantic warming hole in future climate projections: mean atmospheric circulation and the North Atlantic jet. *Journal of Climate*, **32(10)**:2673-2689, doi:10.1175/JCLI-D-18-0647.1, 2019.
- DeFelice NB, Birger R, DeFelice N, Gagner A, Campbell SR, Romano C, Santoriello M, Henke J, Wittie J, Cole B, Kaiser C, Shaman J. Real time 2017 West Nile virus forecast: operational challenges. *JAMA Open Network*, **2(4)**:e193175, doi:10.1001/jamanetworkopen.2019.3175, 2019.
- Galanti M, Birger R, Ud-Dean SMM, Filip I, Morita H, Comito D, Anthony S, Freyer GA, Ibrahim S, Lane B, Ligon C, Rabadan R, Shittu A, Tagne E, Shaman J. Longitudinal active sampling for respiratory viral infections across age groups. *Influenza and Other Respiratory Viruses*, **13(3)**:226-232, doi:10.1111/irv.12629, 2019.
- Reis J, Yamana T, Kandula S, Shaman J. Superensemble forecast of respiratory syncytial virus outbreaks at regional, state and municipal levels. *Epidemics*, **26**:1-8, doi:10.1016/j.epidem.2018.07.001, 2019.
- Kramer SC, Shaman J. Development and validation of influenza forecasting for 64 temperate and tropical countries. *PLOS Computational Biology*, **15(2)**:e1006742, doi:10.1371/journal.pcbi.1006742, 2019.
- Pei S, Cane MA, Shaman J. Predictability in process-based ensemble forecast of influenza. *PLOS Computational Biology*, **15(2)**:e1006783, doi:10.1371/journal.pcbi.1006783, 2019.
- Yang W, Li J, Shaman J. Characteristics of measles epidemics in China (1951-2004) and implications for elimination. *PLOS Computational Biology*, **15(2)**:e1006806, doi:10.1371/journal.pcbi.1006806, 2019.
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- Reich NG, Brooks L, Fox S, Kandula S, McGowan C, Moore E, Osthus D, Ray E, Tushar A, Yamana T, Biggerstaff M, Johansson MA, Rosenfeld R, Shaman J. Forecasting seasonal influenza in the U.S.: a collaborative multi-year, multi-model assessment of forecast performance. *Proceedings of the National Academy of Sciences*, **116(8)**:3146-3154, doi:10.1073/pnas.1812594116, 2019.
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- Alexander K, Heaney A, Shaman J. Distant climate controls and dryland flood pulse dynamics influence diarrheal disease and population vulnerability to climate change. *PLOS Medicine*, **15(11)**:e1002688, doi:10.1371/journal.pmed.1002688, 2018.
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- Fu C, Dong Z, Shen J, Yang Z, Liao Y, Hu W, Pei S, Wang M, Shaman J. Population impact of the Lanzhou Lamb Rotavirus (LLR) vaccine: data from 9 years of immunization in Guangzhou, China. *JAMA Network Open*, **1(4)**:e181382, doi:10.1001/jamanetworkopen.2018.1382, 2018.
- Yang W, Cummings MJ, Bakamutumaho B, Kayiwa J, Owor N, Namagambo B, Byaruhanga T, Lutwama JJ, O'Donnell, MR, Shaman J. Transmission dynamics of influenza in two major cities of Uganda. *Epidemics*, **24**:43-48, doi.org/10.1016/j.epidem.2018.03.002, 2018.
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- Shea B, Knowlton K, Shaman J. The need for informed climate-health governance. *International Journal of Health Governance*, **23(3)**:196-204, doi:10.1108/IJHG-01-2018-0001, 2018.
- Kandula S, Yamana T, Pei S, Yang W, Morita H, Shaman J. Evaluation of mechanistic and statistical methods in forecasting influenza-like illness. *Journal of the Royal Society Interface*, **15**:20180174, doi:10.1098/rsif.2018.0174, 2018.
- Birger R, Morita H, Comito D, Filip I, Galanti M, Lane B, Ligon C, Rosenbloom D, Shittu A, Ud-Dean M, Desalle R, Planet P, Shaman J. Asymptomatic shedding of respiratory virus among an ambulatory population across seasons. *mSphere*, **3**:e00249-18. <https://doi.org/10.1128/mSphere.00249-18>, 2018.
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- Chattopadhyay I, Kiciman E, Elliott JW, Shaman J, Rzhetsky A. Conjunctions of factors triggering waves of seasonal influenza. *eLife*, **7**:e30756, doi:10.7554/eLife.30756, 2018.
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