

# Oliver John Watson

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## EMPLOYMENT

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**London School of Hygiene and Tropical Medicine** (Oct 2021 – Present)

- Schmidt Science Fellow working on statistical methods for mortality estimation.

**Imperial College London** (Oct 2021 – Sept 2026)

- Visiting Researcher in infectious disease modelling.

**Imperial College London** (Apr 2020 – Sept 2021)

- Post-doctorate Researcher in infectious disease modelling.

**Brown University** (Oct 2019 – Mar 2020)

- Post-doctorate Researcher in computational genetics, bioinformatics.

## EDUCATION

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**Imperial College London** (Oct 2015 – Sept 2019)

PhD Student (October 2016 – October 2019. Viva Date 18 Nov 2019):

Project Title: “Integrating genetic information into malaria transmission modelling”

Supervisors: Prof Azra Ghani, Dr Lucy Okell and Dr Robert Verity

MRes Biomedical Research (2015 – 2016): Dissertation

Dean’s Prize Awardee for top overall mark within MRes

Research project published in eLife and cited in World Health Organisation guidance

**University of Cambridge, Pembroke College** (Oct 2011 - Jun 2015)

MSc Systems Biology (2014 – 2015): 1st Class – Top bioinformatics research project mark

BA Natural Sciences (2011 – 2014): 1st Class – Top overall research project mark

Foundation and College Scholarships for outstanding undergraduate examination results

**Marlborough College** (Sep 2005 – Jun 2010)

A Levels (2010): 4A\*s Mathematics, Further Mathematics, Biology, Chemistry

GCSEs (2006 – 2008): 12A\*s, 2As | Additional Mathematics (2008) – Advanced Level, Grade A

## SCIENTIFIC CAREER

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### Research Summary

#### **COVID-19 Modelling:**

In March 2020, I joined the Imperial College COVID-19 response team. I led the software development and modelling in low- and middle-income countries (LMICs), producing epidemic trajectories for the potential global burden of COVID-19 (*Science*). Throughout the pandemic, I provided epidemic scenario projections ([Imperial College COVID-19 LMIC Reports](#)) for every country to the WHO as part of the first costing for a global response to COVID-19 (*Lancet Global Health*) and the WHO Essential Supplies Forecasting Tool. As part of growing evidence of COVID-19 mortality being unobserved, I led two research studies in Damascus (*Nature Communications*) and Khartoum (*Imperial College COVID-19 Report 39*) to ascertain mortality reporting of COVID-19. The latter was part of evidence that led to new ministry of health intervention measures and increased public health campaigns to raise awareness of COVID-19 during Sudan’s second wave. Most recently, in June 2022, I published the first estimates of the global impact of the COVID-19 vaccinations, showing almost 20 million deaths were averted due to vaccination during the first of vaccinations (*Lancet Infectious Diseases*).

#### **Demographic and Health Surveys Program (DHS) Software:**

I have developed an open source software package, *rdhs*, that is the first non-proprietary tool to ease access to and analysis of the DHS datasets. The software was developed to address the need for greater democratization of lower-middle income country data and was presented at the ASTMH annual meeting in 2018. The package has been downloaded over 23,000 times since it was published in December 2018.

### **Malaria transmission modelling:**

In 2016, a study in the Democratic Republic of Congo provided evidence that malaria parasites were evading detection by rapid diagnostic tests due to the deletion of the *pfhrp2* gene. Using mathematical transmission models, I provided evidence that there was selection of *pfhrp2* gene deletions to a WHO panel steered by the director of the WHO Global Malaria Programme. The panel formulated WHO guidance to national malaria control programmes (NMCPs) to implement molecular surveys to estimate *pfhrp2* deletion prevalence. After attending the Malaria Policy Advisory Committee meeting in November 2017, I conducted a collaborative study with the WHO to estimate the potential for seasonal variations in malaria transmission to introduce bias in estimating *pfhrp2* deletion prevalence. These findings informed NMCPs through an interactive online database and field training programmes to optimise surveillance for *pfhrp2*. (Both studies in *eLife*). Additionally, I have modelled the impact of false-negative RDTs on community surveys (*BMJ Global Health*), worked on modelling ivermectin as a possible addition to the currently available malaria control tools (*Lancet Infectious Diseases*), as well as a modelling-based evaluation of the utility of malaria genetics for inferring transmission intensity (*Molecular, Biology and Evolution*) and the impact of partner drug resistance on artemisinin resistance (*Lancet Microbe*).

### **Grants, Scholarships and awards**

- Schmidt Science Fellowship, Dr Oliver Watson, 1 year fellowship. \$100,000. Research Fellow. Sept 2021 - Oct 2022. (Originally awarded April 2020 - delayed due to Imperial COVID-19 work)
- NIH, 1R01AI156267-01A1, Dr Jeffrey Bailey (PI). Artemisinin Resistance in Africa: its emergence and evolution in Rwanda. \$3,989,037. Named co-investigator and independent consultant drawing \$60,000 over 4 years. Aug 2021 - Jul 2025.
- World Health Organisation. Dr Alexandra Hogan (PI). Modelling the Impact of COVID-19 Vaccination Strategies. \$100,533 of which \$52,325 was for 100% FTE on grant as a named postdoctoral research assistant. Mar 2021 - Sept 2021
- Wellcome Trust. Dr Patrick Walker (PI). Modelling the global spread and determinants of COVID-19 transmission. £96,664 of which £30,255 was for 100% FTE on grant as a named postdoctoral research assistant. May 2020 - Nov 2020.
- Wellcome Trust. Mr Oliver Watson. PhD Funding. £165,784.00. Oct 2015 – Sept 2019.
- Pembroke College, Cambridge. 2011 - 2014. £800. Foundation award for scholastic performance.
- Kaggle. September 2018. \$500 machine learning competition for demonstration of mixed-effect models for bounce rate investigation.

### **Academic Service, Membership and Evidence of Esteem**

- **Journal Reviewer:** Nature, PNAS, Nature Communications, PLoS Computational Biology, Genome Biology and Evolution, PLoS Global Public Health, American Journal of Tropical Medicine & Hygiene, Evolutionary Applications, Malaria Journal, Conflict and Health
- **Grant Reviewer:** Wellcome Trust and NIH
- **Member:** Malaria Modelling Consortium – Bill and Melinda Gates Foundation funded consortium of mathematical modelling groups providing advice for global malaria policy.
- **Member:** ROpenSci – Community of software developers building open source and reproducible tools using the R programming language.
- 53 publications, with 15 first/equal-contribution (incl. *Science*, *Lancet Infectious Diseases*, *BMJ*)
- 12 invited talks (incl. UNC-Chapel Hill, Save The Children, Columbia University, PATH, Brown)
- 10 Conference presentations (6 Oral and 4 poster) at ASTMH, GEMalaria, Epidemics
- 2 book chapters (Encyclopaedia of Malaria)

### **Teaching and Supervision**

- **PhD Co-supervisor:** Ruth McCabe (University of Oxford, 2021-), Sawyer Smith (Brown, 2022-)
- **Undergraduate:** Rebecca Kirby (Brown, 2020), Aris Paschialidis (Brown, 2020)
- **Teaching Assistant:** Msc Epidemiology (2016-2021). SACA teaching award nominee (2019)
- **Short Courses:** Teaching material and demonstrations on 2-week ID modelling (2016-2018)

### **Outreach**

- **Media:** TV (Sky, BBC, Euronews, TV Globo), Radio (BBC, RTS, Sky), News (FT, Times, Guardian, Washington Post, NY Times, Economist - cover story) related to my COVID-19 work
- **Central London Data Science:** Founder and organiser of data science meetup. >3000 members across industry, academia and government.
- **Brilliant Club:** Co-authored 8-week Key Stage 2 UK (7-11) curriculum - "Disease Detectives"

## PUBLICATIONS

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\* = Equal Author Contribution

1. **O. J. Watson\***, G. Barnsley\*, J. Toor, A. B. Hogan, P. Winskill, A. C. Ghani, Global impact of the first year of COVID-19 vaccination: a mathematical modelling study. *Lancet Infect. Dis.* (2022), doi:10.1016/S1473-3099(22)00320-6.
2. **O. J. Watson**, B. Gao, T. D. Nguyen, T. N.-A. Tran, M. A. Penny, D. L. Smith, L. Okell, R. Aguas, M. F. Boni, Pre-existing partner-drug resistance to artemisinin combination therapies facilitates the emergence and spread of artemisinin resistance: a consensus modelling study. *Lancet Microbe* (2022), doi:10.1016/S2666-5247(22)00155-0.
3. B. Andagalu, **O. J. Watson**, I. Onyango, B. Opot, R. Okoth, G. Chemwor, P. Sifuna, D. Juma, A. Cheruiyot, R. Yeda, C. Okudo, J. Wafubwa, S. Yalwala, D. Abuom, B. Ogutu, J. Cowden, H. M. Akala, E. Kamau, Malaria Transmission Dynamics in High Transmission Setting of Western Kenya and the Inadequate Treatment Response to Artemether-lumefantrine in an Asymptomatic Population. *Clin. Infect. Dis.* (2022), doi:10.1093/cid/ciac527.
4. M. Ghafari\*, **O. J. Watson\***, A. Karlinsky, L. Ferretti, A. Katzourakis, A framework for reconstructing SARS-CoV-2 transmission dynamics using excess mortality data. *Nat. Commun.* 13, 3015 (2022).
5. N. F. Brazeau, R. Verity, S. Jenks, H. Fu, C. Whittaker, P. Winskill, I. Dorigatti, P. G. T. Walker, S. Riley, R. P. Schnekenberg, H. Hoeltgebaum, T. A. Mellan, S. Mishra, H. J. T. Unwin, **O. J. Watson**, Z. M. Cucunubá, M. Baguelin, L. Whittles, S. Bhatt, A. C. Ghani, N. M. Ferguson, L. C. Okell, Estimating the COVID-19 infection fatality ratio accounting for seroreversion using statistical modelling. *Commun. Med.* 2, 54 (2022).
6. M. Pons-Salort, J. John, **O. J. Watson**, N. F. Brazeau, R. Verity, G. Kang, N. C. Grassly, Reassessing Reported Deaths and Estimated Infection Attack Rate during the First 6 Months of the COVID-19 Epidemic, Delhi, India. *Emerg. Infect. Dis.* 28, 759–766 (2022).
7. D. Olivera Mesa, A. B. Hogan, **O. J. Watson**, G. D. Charles, K. Hauck, A. C. Ghani, P. Winskill, Modelling the impact of vaccine hesitancy in prolonging the need for Non-Pharmaceutical Interventions to control the COVID-19 pandemic. *Commun. Med.* 2, 14 (2022).
8. C. Favas, P. Jarrett, R. Ratnayake, **O. J. Watson**, F. Checchi, Country differences in transmissibility, age distribution and case-fatality of SARS-CoV-2: a global ecological analysis. *Int. J. Infect. Dis.* 114, 210–218 (2022).
9. R. McCabe, M. D. Kont, N. Schmit, C. Whittaker, A. Løchen, P. G. T. Walker, A. C. Ghani, N. M. Ferguson, P. J. White, C. A. Donnelly, **O. J. Watson**, Communicating uncertainty in epidemic models. *Epidemics.* 37, 100520 (2021).
10. C. Whittaker\*, P. G. T. Walker, M. Alhaffar, A. Hamlet, B. A. Djaafara, A. Ghani, N. Ferguson, M. Dahab, F. Checchi, **O. J. Watson\***, Under-reporting of deaths limits our understanding of true burden of covid-19. *BMJ.* 375, n2239 (2021).
11. C. Whittaker, **O. J. Watson**, C. Alvarez-Moreno, N. Angkasekwini, A. Boonyasiri, L. Carlos Triana, D. Chanda, L. Charoenpong, M. Chayakulkeeree, G. S. Cooke, J. Croda, Z. M. Cucunubá, B. A. Djaafara, C. F. Estofotele, M.-E. Grillet, N. R. Faria, S. Figueiredo Costa, D. A. Forero-Peña, D. M. Gibb, A. C. Gordon, R. L. Hamers, A. Hamlet, V. Irawany, A. Jitmuang, N. Keurueangkul, T. N. Kimani, M. Lampo, A. S. Levin, G. Lopardo, R. Mustafa, S. Nayagam, T. Ngamprasertchai, N. I. H. Njeri, M. L. Nogueira, E. Ortiz-Prado, M. W. Perroud Jr, A. N. Phillips, P. Promsin, A. Qavi, A. J. Rodger, E. C. Sabino, S. Sangkaew, D. Sari, R. Sirijatuphat, A. C. Sposito, P. Srisangthong, H. A. Thompson, Z. Udwadia, S. Valderrama-Beltrán, P. Winskill, A. C. Ghani, P. G. T. Walker, T. B. Hallett, Understanding the Potential Impact of Different Drug Properties On SARS-CoV-2 Transmission and Disease Burden: A Modelling Analysis. *Clin. Infect. Dis.* (2021), doi:10.1093/cid/ciab837.
12. T. Mangal, C. Whittaker, D. Nkhoma, W. Ng'ambi, **O. Watson**, P. Walker, A. Ghani, P. Revill, T. Colbourn, A. Phillips, T. Hallett, J. Mfutso-Bengo, Potential impact of intervention strategies on COVID-19 transmission in Malawi: a mathematical modelling study. *BMJ Open.* 11, e045196 (2021).

13. N. Imai, A. B. Hogan, L. Williams, A. Cori, T. D. Mangal, P. Winskill, L. K. Whittles, **O. J. Watson**, E. S. Knock, M. Baguelin, P. N. Perez-Guzman, K. A. M. Gaythorpe, R. Sonabend, A. C. Ghani, N. M. Ferguson, Interpreting estimates of coronavirus disease 2019 (COVID-19) vaccine efficacy and effectiveness to inform simulation studies of vaccine impact: a systematic review. *Wellcome Open Res.* 6, 185 (2021).
14. E. S. Knock, L. K. Whittles, J. A. Lees, P. N. Perez-Guzman, R. Verity, R. G. FitzJohn, K. A. M. Gaythorpe, N. Imai, W. Hinsley, L. C. Okell, A. Rosello, N. Kantas, C. E. Walters, S. Bhatia, **O. J. Watson**, C. Whittaker, L. Cattarino, A. Boonyasiri, B. A. Djaafara, K. Fraser, H. Fu, H. Wang, X. Xi, C. A. Donnelly, E. Jauneikaite, D. J. Laydon, P. J. White, A. C. Ghani, N. M. Ferguson, A. Cori, M. Baguelin, Key epidemiological drivers and impact of interventions in the 2020 SARS-CoV-2 epidemic in England. *Sci. Transl. Med.* 13 (2021), doi:10.1126/scitranslmed.abg4262.
15. R. McCabe, M. D. Kont, N. Schmit, C. Whittaker, A. Løchen, M. Baguelin, E. Knock, L. K. Whittles, J. Lees, N. F. Brazeau, P. G. Walker, A. C. Ghani, N. M. Ferguson, P. J. White, C. A. Donnelly, K. Hauck, **O. J. Watson**, Modelling intensive care unit capacity under different epidemiological scenarios of the COVID-19 pandemic in three Western European countries. *Int. J. Epidemiol.* 50, 753–767 (2021).
16. N. F. Brazeau, C. L. Mitchell, A. P. Morgan, M. Deutsch-Feldman, **O. J. Watson**, K. L. Thwai, P. Gelabert, L. van Dorp, C. Y. Keeler, A. Waltmann, M. Emch, V. Gartner, B. Redelings, G. A. Wray, M. K. Mwandagaliwa, A. K. Tshetu, J. L. Likwela, J. K. Edwards, R. Verity, J. B. Parr, S. R. Meshnick, J. J. Juliano, The epidemiology of Plasmodium vivax among adults in the Democratic Republic of the Congo. *Nat. Commun.* 12, 4169 (2021).
17. Z. Barnett-Howell, **O. J. Watson**, A. M. Mobarak, The benefits and costs of social distancing in high- and low-income countries. *Trans. R. Soc. Trop. Med. Hyg.* 115, 807–819 (2021).
18. T. P. Smith, S. Flaxman, A. S. Gallinat, S. P. Kinoshian, M. Stemkovski, H. J. T. Unwin, **O. J. Watson**, C. Whittaker, L. Cattarino, I. Dorigatti, M. Tristram, W. D. Pearce, Temperature and population density influence SARS-CoV-2 transmission in the absence of nonpharmaceutical interventions. *Proc. Natl. Acad. Sci. U. S. A.* 118 (2021), doi:10.1073/pnas.2019284118.
19. B. A. Djaafara, C. Whittaker, **O. J. Watson**, R. Verity, N. F. Brazeau, Widyastuti, D. Oktavia, V. Adrian, N. Salama, S. Bhatia, P. Nouvellet, E. Sherrard-Smith, T. S. Churcher, H. Surendra, R. N. Lina, L. L. Ekawati, K. D. Lestari, A. Andrianto, G. Thwaites, J. K. Baird, A. C. Ghani, I. R. F. Elyazar, P. G. T. Walker, Using syndromic measures of mortality to capture the dynamics of COVID-19 in Java, Indonesia, in the context of vaccination rollout. *BMC Med.* 19, 146 (2021).
20. A. B. Hogan, P. Winskill, **O. J. Watson**, P. G. T. Walker, C. Whittaker, M. Baguelin, N. F. Brazeau, G. D. Charles, K. A. M. Gaythorpe, A. Hamlet, E. Knock, D. J. Laydon, J. A. Lees, A. Løchen, R. Verity, L. K. Whittles, F. Muhib, K. Hauck, N. M. Ferguson, A. C. Ghani, Within-country age-based prioritisation, global allocation, and public health impact of a vaccine against SARS-CoV-2: A mathematical modelling analysis. *Vaccine.* 39, 2995–3006 (2021).
21. **O. J. Watson**, M. Alhaffar, Z. Mehchy, C. Whittaker, Z. Akil, N. F. Brazeau, G. Cuomo-Dannenburg, A. Hamlet, H. A. Thompson, M. Baguelin, R. G. FitzJohn, E. Knock, J. A. Lees, L. K. Whittles, T. Mellan, P. Winskill, Imperial College COVID-19 Response Team, N. Howard, H. Clapham, F. Checchi, N. Ferguson, A. Ghani, E. Beals, P. Walker, Leveraging community mortality indicators to infer COVID-19 mortality and transmission dynamics in Damascus, Syria. *Nat. Commun.* 12, 2394 (2021).
22. M. Ragonnet-Cronin, O. Boyd, L. Geidelberg, D. Jorgensen, F. F. Nascimento, I. Siveroni, R. A. Johnson, M. Baguelin, Z. M. Cucunubá, E. Jauneikaite, S. Mishra, **O. J. Watson**, N. Ferguson, A. Cori, C. A. Donnelly, E. Volz, Genetic evidence for the association between COVID-19 epidemic severity and timing of non-pharmaceutical interventions. *Nat. Commun.* 12, 2188 (2021).
23. H. M. Akala\*, **O. J. Watson\***, K. K. Mitei, D. W. Juma, R. Verity, L. A. Ingasia, B. H. Opot, R. O. Okoth, G. C. Chemwor, J. A. Juma, E. W. Mwakio, N. Brazeau, A. C. Cheruiyot, R. A. Yeda, M. N. Maraka, C. O. Okello, D. P. Kateete, J. R. Managbanag, B. Andagalu, B. R. Ogutu, E. Kamau, Plasmodium interspecies interactions during a period of increasing prevalence of Plasmodium ovale in symptomatic individuals seeking treatment: an observational study. *Lancet Microbe.* 2, e141–e150 (2021).

24. P. Nouvellet, S. Bhatia, A. Cori, K. E. C. Ainslie, M. Baguelin, S. Bhatt, A. Boonyasiri, N. F. Brazeau, L. Cattarino, L. V. Cooper, H. Coupland, Z. M. Cucunuba, G. Cuomo-Dannenburg, A. Dighe, B. A. Djaafara, I. Dorigatti, O. D. Eales, S. L. van Elsland, F. F. Nascimento, R. G. FitzJohn, K. A. M. Gaythorpe, L. Geidelberg, W. D. Green, A. Hamlet, K. Hauck, W. Hinsley, N. Imai, B. Jeffrey, E. Knock, D. J. Laydon, J. A. Lees, T. Mangal, T. A. Mellan, G. Nedjati-Gilani, K. V. Parag, M. Pons-Salort, M. Ragonnet-Cronin, S. Riley, H. J. T. Unwin, R. Verity, M. A. C. Vollmer, E. Volz, P. G. T. Walker, C. E. Walters, H. Wang, **O. J. Watson**, C. Whittaker, L. K. Whittles, X. Xi, N. M. Ferguson, C. A. Donnelly, Reduction in mobility and COVID-19 transmission. *Nat. Commun.* 12, 1090 (2021).
25. **O. J. Watson**, L. C. Okell, J. Hellewell, H. C. Slater, H. J. T. Unwin, I. Omedo, P. Bejon, R. W. Snow, A. M. Noor, K. Rockett, C. Hubbard, J. I. Nankabirwa, B. Greenhouse, H.-H. Chang, A. C. Ghani, R. Verity, Evaluating the Performance of Malaria Genetics for Inferring Changes in Transmission Intensity Using Transmission Modeling. *Mol. Biol. Evol.* **38**, 274–289 (2021).
26. A. Mousa, P. Winskill, **O. J. Watson**, O. Ratmann, M. Monod, M. Ajelli, A. Diallo, P. J. Dodd, C. G. Grijalva, M. C. Kiti, A. Krishnan, R. Kumar, S. Kumar, K. O. Kwok, C. F. Lanata, O. L. P. de Waroux, K. Leung, W. Mahikul, A. Melegaro, C. D. Morrow, J. Mossong, E. F. G. Neal, D. J. Nokes, W. Pan-ngum, G. E. Potter, F. M. Russell, S. Saha, J. D. Sugimoto, W. I. Wei, R. R. Wood, J. Wu, J. Zhang, P. Walker, C. Whittaker, Social contact patterns and implications for infectious disease transmission – a systematic review and meta-analysis of contact surveys. *Elife*. 10, e70294 (2021).
27. K. A. Moser, R. A. Madebe, O. Aydemir, M. G. Chiduo, C. I. Mandara, S. F. Rumisha, F. Chaky, M. Denton, P. W. Marsh, R. Verity, **O. J. Watson**, B. Ngasala, S. Mkude, F. Molteni, R. Njau, M. Warsame, R. Mandike, A. M. Kabanywanyi, M. K. Mahende, E. Kamugisha, M. Ahmed, R. A. Kavishe, G. Greer, C. A. Kitojo, E. J. Reaves, L. Mlunde, D. Bishanga, A. Mohamed, J. J. Juliano, D. S. Ishengoma, J. A. Bailey, Describing the current status of *Plasmodium falciparum* population structure and drug resistance within mainland Tanzania using molecular inversion probes. *Mol. Ecol.* 30, 100–113 (2021).
28. H. Fu, H. Wang, X. Xi, A. Boonyasiri, Y. Wang, W. Hinsley, K. J. Fraser, R. McCabe, D. Olivera Mesa, J. Skarp, A. Ledda, T. Dewé, A. Dighe, P. Winskill, S. L. van Elsland, K. E. C. Ainslie, M. Baguelin, S. Bhatt, O. Boyd, N. F. Brazeau, L. Cattarino, G. Charles, H. Coupland, Z. M. Cucunuba, G. Cuomo-Dannenburg, C. A. Donnelly, I. Dorigatti, O. D. Eales, R. G. FitzJohn, S. Flaxman, K. A. M. Gaythorpe, A. C. Ghani, W. D. Green, A. Hamlet, K. Hauck, D. J. Haw, B. Jeffrey, D. J. Laydon, J. A. Lees, T. Mellan, S. Mishra, G. Nedjati-Gilani, P. Nouvellet, L. Okell, K. V. Parag, M. Ragonnet-Cronin, S. Riley, N. Schmit, H. A. Thompson, H. J. T. Unwin, R. Verity, M. A. C. Vollmer, E. Volz, P. G. T. Walker, C. E. Walters, **O. J. Watson**, C. Whittaker, L. K. Whittles, N. Imai, S. Bhatia, N. M. Ferguson, Database of epidemic trends and control measures during the first wave of COVID-19 in mainland China. *Int. J. Infect. Dis.* 102, 463–471 (2021).
29. H. A. Thompson, N. Imai, A. Dighe, K. E. C. Ainslie, M. Baguelin, S. Bhatia, S. Bhatt, A. Boonyasiri, O. Boyd, N. F. Brazeau, L. Cattarino, L. V. Cooper, H. Coupland, Z. Cucunuba, G. Cuomo-Dannenburg, B. Djaafara, I. Dorigatti, S. van Elsland, R. FitzJohn, H. Fu, K. A. M. Gaythorpe, W. Green, T. Hallett, A. Hamlet, D. Haw, S. Hayes, W. Hinsley, B. Jeffrey, E. Knock, D. J. Laydon, J. Lees, T. D. Mangal, T. Mellan, S. Mishra, A. Mousa, G. Nedjati-Gilani, P. Nouvellet, L. Okell, K. V. Parag, M. Ragonnet-Cronin, S. Riley, H. J. T. Unwin, R. Verity, M. Vollmer, E. Volz, P. G. T. Walker, C. Walters, H. Wang, Y. Wang, **O. J. Watson**, C. Whittaker, L. K. Whittles, P. Winskill, X. Xi, C. A. Donnelly, N. M. Ferguson, SARS-CoV-2 infection prevalence on repatriation flights from Wuhan City, China. *J. Travel Med.* 27 (2020), doi:10.1093/jtm/taaa135.
30. K. Witmer, F. A. Dahalan, M. J. Delves, S. Yahiya, **O. J. Watson**, U. Straschil, D. Chiwcharoen, B. Sornboon, S. Pukrittayakamee, R. D. Pearson, V. M. Howick, M. K. N. Lawniczak, N. J. White, A. M. Dondorp, L. C. Okell, K. Chotivanich, A. Ruecker, J. Baum, Transmission of Artemisinin-Resistant Malaria Parasites to Mosquitoes under Antimalarial Drug Pressure. *Antimicrob. Agents Chemother.* 65 (2020), doi:10.1128/AAC.00898-20.
31. H. J. T. Unwin, S. Mishra, V. C. Bradley, A. Gandy, T. A. Mellan, H. Coupland, J. Ish-Horowicz, M. A. C. Vollmer, C. Whittaker, S. L. Filippi, X. Xi, M. Monod, O. Ratmann, M. Hutchinson, F. Valka, H. Zhu, I. Hawryluk, P. Milton, K. E. C. Ainslie, M. Baguelin, A. Boonyasiri, N. F. Brazeau, L. Cattarino, Z. Cucunuba, G. Cuomo-Dannenburg, I. Dorigatti, O. D. Eales, J. W. Eaton, S. L. van Elsland, R. G. FitzJohn, K. A. M. Gaythorpe, W. Green, W. Hinsley, B. Jeffrey, E. Knock, D. J. Laydon, J. Lees, G. Nedjati-Gilani, P. Nouvellet, L. Okell, K. V. Parag, I. Siveroni, H. A. Thompson, P. Walker, C. E. Walters, **O. J. Watson**, L. K. Whittles, A. C. Ghani, N. M. Ferguson, S. Riley, C. A. Donnelly, S. Bhatt, S. Flaxman, State-level tracking of COVID-19 in the United States. *Nat. Commun.* 11, 6189 (2020).

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42. R. Verity, O. Aydemir, N. F. Brazeau, **O. J. Watson**, N. J. Hathaway, M. K. Mwandagaliwa, P. W. Marsh, K. Thwai, T. Fulton, M. Denton, A. P. Morgan, J. B. Parr, P. K. Tumwebaze, M. Conrad, P. J. Rosenthal, D. S. Ishengoma, J. Ngondi, J. Gutman, M. Mulenga, D. E. Norris, W. J. Moss, B. A. Mensah, J. L. Myers-Hansen, A. Ghansah, A. K. Tshefu, A. C. Ghani, S. R. Meshnick, J. A. Bailey, J. J. Juliano, The impact of antimalarial resistance on the genetic structure of *Plasmodium falciparum* in the DRC. *Nat. Commun.* 11, 2107 (2020).
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44. H. C. Slater, B. D. Foy, K. Kobylinski, C. Chaccour, **O. J. Watson**, J. Hellewell, G. Aljayyousi, T. Bousema, J. Burrows, U. D'Alessandro, H. Alout, F. O. Ter Kuile, P. G. T. Walker, A. C. Ghani, M. R. Smit, Ivermectin as a novel complementary malaria control tool to reduce incidence and prevalence: a modelling study. *Lancet Infect. Dis.* 20, 498–508 (2020).
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47. **O. J. Watson\***, K. M. Sumner\*, M. Janko, V. Goel, P. Winskill, H. C. Slater, A. Ghani, S. R. Meshnick, J. B. Parr, False-negative malaria rapid diagnostic test results and their impact on community-based malaria surveys in sub-Saharan Africa. *BMJ Glob Health.* 4, e001582 (2019).
48. **O. J. Watson**, R. FitzJohn, J. W. Eaton, *rdhs*: an R package to interact with The Demographic and Health Surveys (DHS) Program datasets. *Wellcome Open Res.* 4, 103 (2019).
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50. L. C. Okell, L. M. Reiter, L. S. Ebbe, V. Baraka, D. Bisanzio, **O. J. Watson**, A. Bennett, R. Verity, P. Gething, C. Roper, M. Alifrangis, Emerging implications of policies on malaria treatment: genetic changes in the *Pfmdr-1* gene affecting susceptibility to artemether-lumefantrine and artesunate-amodiaquine in Africa. *BMJ Glob Health.* 3, e000999 (2018).
51. Í. Cremin\*, **O. Watson\***, A. Heffernan, N. Imai, N. Ahmed, S. Bivegete, T. Kimani, D. Kyriacou, P. Mahadevan, R. Mustafa, P. Pagoni, M. Sophiea, C. Whittaker, L. Beacroft, S. Riley, M. C. Fisher, An infectious way to teach students about outbreaks. *Epidemics.* 23, 42–48 (2018).
52. R. Verity, N. J. Hathaway, A. Waltmann, S. M. Doctor, **O. J. Watson**, J. C. Patel, K. Mwandagaliwa, A. K. Tshefu, J. A. Bailey, A. C. Ghani, J. J. Juliano, S. R. Meshnick, *Plasmodium falciparum* genetic variation of *var2csa* in the Democratic Republic of the Congo. *Malar. J.* 17, 46 (2018).

53. **O. J. Watson**, H. C. Slater, R. Verity, J. B. Parr, M. K. Mwandagaliwa, A. Tshefu, S. R. Meshnick, A. C. Ghani, Modelling the drivers of the spread of *Plasmodium falciparum* hrp2 gene deletions in sub-Saharan Africa. *Elife*. 6 (2017), doi:10.7554/eLife.25008.

### **Book Chapters**

1. I. Routledge, **O. J. Watson**, J. T. Griffin, A. C. Ghani, in *Encyclopedia of Malaria*, P. G. Kremsner, S. Krishna, Eds. (Springer New York, New York, NY, 2018; [https://doi.org/10.1007/978-1-4614-8757-9\\_79-1](https://doi.org/10.1007/978-1-4614-8757-9_79-1)), pp. 1–7.

2. **O. J. Watson**, I. Routledge, J. T. Griffin, A. C. Ghani, in *Encyclopedia of Malaria*, P. G. Kremsner, S. Krishna, Eds. (Springer New York, New York, NY, 2018; [https://doi.org/10.1007/978-1-4614-8757-9\\_146-1](https://doi.org/10.1007/978-1-4614-8757-9_146-1)), pp. 1–7.

### **CONFERENCE PRESENTATIONS**

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1. Watson, O. J. & Okell, L. Multiple first line therapies versus reducing overprescription of antimalarials to slow antimalarial resistance. Oral presentation at ASTMH. 99, 443 (2018).
2. Watson, O. J. et al. The impact of seasonal variation in the detection of clinically relevant *Plasmodium falciparum* hrp2 gene deletions: a modelling study. Poster presentation at ASTMH. 99, 340 (2018).
3. Watson, O. J. & Eaton, J. rdhs: an R package to interact with the demographic and health surveys (DHS) program data sets. Oral presentation at ASTMH. 99, 661 (2018).
4. Watson, O. J. Okell, L. & Ghani, A., Verity, R. Evaluating the performance of malaria genomics for inferring changes in transmission intensity using transmission modelling. Poster presentation at Genomic Epidemiology of Malaria (2018).
5. Cremin, Í.,\* Watson, O. J.,\* et al. An infectious way to teach students about outbreaks. Poster presentation at Epidemics. (2017).
6. Watson, O. J., Verity, R., Okell, L. & Ghani, A. Characterizing the potential bias within genomic tools for inferring changes in *Plasmodium falciparum* transmission intensities. Oral presentation at ASTMH. 97, 418 (2017).
7. Watson, O. J. et al. Drivers of the spread of “diagnostic resistant” *P. falciparum* malaria: a model-based evaluation of the spread of *pfhrp2* gene deletions in Africa. Oral late breaker presentation at ASTMH. (2016).
8. Watson, O. J. et al. Modelling the drivers of *Plasmodium falciparum* hrp2 deletions. Presentation as part of a WHO organised panel meeting on “*Plasmodium falciparum* hrp2/3 gene deletions: update, implications and response” at ASTMH 2016.



## EDITORIAL RESPONSIBILITIES + AFFILIATIONS

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Reviewer: Nature, PNAS, Nature Communications, PLoS Computational Biology, Genome Biology and Evolution, PLoS Global Public Health, American Journal of Tropical Medicine & Hygiene, Evolutionary Applications, Malaria Journal, Conflict and Health

Member: Malaria Modelling Consortium – Bill and Melinda Gates Foundation funded consortium of mathematical modelling groups to provide consensus advice in support of global malaria policy.

Member: ROpenSci – Community of software developers building open source and reproducible tools using the R programming language to further scientific research and lower the barrier to working scientific data sources.

## TEACHING EXPERIENCE

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### Undergraduate Supervision

Rebecca Kirby. Brown University. 2020 Spring Semester. Spatial Clustering of fever, diarrhoea and ARI at the household level in lower-middle income countries.

Aris Paschialidis: Brown University. 2020 Spring Semester. Direct estimation of COI from whole genome sequence data.

### Central London Data Science

(Jun 2016 – Present)

Organiser of meetup group teaching fundamentals of data science to over 3000 members.

Awarded \$500 in Kaggle Competition for demonstration of mixed-effect models

### Teaching Assistant, Imperial College London

(Oct 2016 – Oct 2019)

Practical demonstration assistance on MSc in Epidemiology.

SACA teaching award nominee (2019)

### Brilliant Club Course Author

(Jan 2018 – Jun 2018)

Co-authored an 8-week Key Stage 2 UK (ages 7-11) curriculum entitled "Disease Detectives"

### Infectious Disease Modelling Course Organiser

(Jun 2016 – Sep 2018)

Organised teaching material and demonstration assistance on Imperial College London 2-week short course on infectious disease modelling.