Alexandre de Figueiredo

CONTACT INFORMATION

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RESEARCH INTERESTS

I am interested in finding mathematical solutions to complex issues in public health and vaccinations by drawing on my background in theoretical physics, applied mathematics and statistics. I have worked extensively on probing ties between socioeconomic data and both coverage rates and vaccine confidence levels; on forecasting international vaccine coverage rates; and on the analysis of large-scale public health datasets. I have a strong recent publication record in this field with publications in *Lancet Global Health* and – more recently – in *EBioMedicine*; the latter of which has received considerable media interest, having been published in *Science*, *Scientific American*, *the Financial Times*, and *Le Monde*, demonstrating my ability to deploy public health messages to large audiences. I am currently interested in the large-scale inference of levels of vaccine hesitancy in the absence of explicit vaccine attitude survey data in India, and am pursuing a research career in the development of monitoring and forecasting systems for vaccine coverage and vaccine hesitancy.

EDUCATION

Imperial College London, London, UK

PhD candidate (thesis submitted), Applied Mathematics, *Expected:* Spring 2018

- Thesis: *A mathematical assessment of the global state of vaccine hesitancy and coverage*
- Advisors: Dr. Nick Jones and Dr. Iain Johnston

MSci, Physics with Theoretical Physics (First class hons.), July 2011

- MSci thesis: *Movement analysis and self-organisation in Temnothorax albipennis*
- Advisor: Prof. Kim Christensen

University of Oxford, Oxford, UK

MSc, Mathematical Modelling and Scientific Computing, August 2012

- MSc thesis: *Dynamic response of a thin elastic disc with holes to in-plane forcing*
- Advisor: Dr David Allwright

RESEARCH EXPERIENCE

EPSRC Prize fellow from 1 February 2018
Imperial College London

- Fellowship: *Development and deployment of novel latent variable models to infer confidence in vaccinations in India*
- Advisors: Dr Nick Jones and Prof. Heidi Larson (LSHTM)

Research Associate June - November 2017
Imperial College London

- Grant: *Vaccine hesitancy and socioeconomic status, scientific temperament and media preference*
- Advisors: Dr Nick Jones, Prof. Heidi Larson (LSHTM), Ethan Greenwood (Wellcome Trust)

Knowledge Exchange Research Associate August - December 2016
Imperial College London

- Grant: *Extending Vaccine Confidence Inference from an International to an Indian Sub-National Scale: Building Networks, Obtaining Data and Deploying Existing Analysis Tools*
- Advisors: Dr Nick Jones & Dr. Monica Chaturvedi (Public Health Foundation India)

Refereed Journal Publications

1. H. J. Larson*, **A. de Figueiredo***, *et. al.* "The state of vaccine confidence 2016: global insights through a 67-country survey" *EBioMedicine*, 12: 295-301, 2016. *Joint corresponding and first authors. [Commentary by Steven Black in *EBioMedicine*; coverage in *Science*, *Scientific American*, *FT*, and *Le Monde*; 26 citations since October 2016.]
2. **A. de Figueiredo**, I. G. Johnston, D. M. D. Smith, H. J. Larson, and N. Jones. "Forecasting time-series trends in vaccination coverage and their links to socio-economic factors: A global analysis over 30 years" *The Lancet Global Health*, 4 (10): e726-e735, 2016. [Commentary by Michiel van Boven and Alies van Lier in *The Lancet Global Health*.]
3. **A. de Figueiredo**, I. G. Johnston, D. M. D. Smith, N. Jones, H. J. Larson. "Changing socioeconomic determinants of childhood vaccines: a global analysis over three decades" [Meeting abstract] *The Lancet Global Health*, 3: S20, 2015.
4. K. Christensen, D. Papavassiliou, **A. de Figueiredo**, N. R. Franks, A. B. Sendova. "Universality in ant behaviour". *Journal of the Royal Society Interface*. 12.102: 20140985, 2015.

Papers in Preparation

1. **A. de Figueiredo**, H. J. Larson, S. Agarwal and N. Jones . "Deriving a quantitative index of vaccine hesitancy: mapping regional trends and establishing determinants both worldwide and in the Sahel"

Teaching Experience and Outreach

Teaching Assistant Autumns/Springs 2015-present

M1C - Mathematical Computation (MATLAB & Python)
Instructor: Dr. Philip Ramsden
Department of Mathematics, Imperial College London

M1S - Probability and Statistics I
Instructor: Prof. Emma McCoy
Department of Mathematics, Imperial College London

MSc student Co-supervisor 2014

- Assisted in supervision of MSc student investigating Google Trend search term correlates of vaccine coverage
  Department of Mathematics, Imperial College London

Academic and Personal Mentor June 2009 - August 2012

- Classroom teaching assistant of science projects for schoolchildren
  Exscitec, Imperial College London

Presentations

- Public Health Foundation India (Delhi, India) January 2017
- Imperial Biomathematics Seminar November 2013
- Monthly group talks October 2012 to present

Service

Subwarden, Tizard Hall, Imperial College London October 2012 – July 2016

- Live on site with undergraduate residents with responsibilities for student welfare, discipline, and social event planning from pre-allocated budgets.
- Responsible for interviewing prospective hall seniors and subwardens

Computer programming

- Matlab, Python, R (fluent); C, C++, UNIX shell scripting, SQL (some experience).