

# Natalie Exner Dean

## Curriculum Vitae

### CONTACT INFORMATION

Department of Biostatistics  
University of Florida  
P.O. Box 117450  
Gainesville, FL 32611 USA

*Phone:* (352) 294-1945  
*Cell:* (781) 223-1750  
*Office:* Dauer Hall 464  
*Email:* nataliedean@ufl.edu

### EDUCATION

Ph.D. Biostatistics, Harvard University 2014  
*Thesis:* "Surveillance methods for monitoring HIV incidence and drug resistance"  
A.M. Biostatistics, Harvard University 2011  
B.A. Mathematics/Statistics, Biology, Boston University, *summa cum laude* 2009

### RESEARCH AND PROFESSIONAL EXPERIENCE

Assistant Professor, Department of Biostatistics, University of Florida, Gainesville, FL 2017–Present  
  
Postdoctoral Associate, Department of Biostatistics, University of Florida, Gainesville, FL 2015–2017  
*Faculty Mentor:* Professor Ira M. Longini  
  
External Statistical Consultant, HIV Department, World Health Organization, Geneva, Switzerland 2014–2015  
  
Research Assistant, Department of Biostatistics, Harvard T.H. Chan School of Public Health, Boston, MA 2009–2014  
*Faculty Mentor:* Professor Marcello Pagano  
  
Student Researcher, Barbados Nutrition Study, Harvard Medical School, Boston, MA 2007–2009  
*Faculty Mentor:* Professor Janina Galler

### TEACHING EXPERIENCE

Instructor, Department of Biostatistics, University of Florida  
STA 6177/PHC6937: Applied survival analysis 2017  
PHC 4094: Intro to biostatistics for health science and public health 2016  
  
Instructor, Department of Biostatistics, Harvard University  
Problem solving in advanced statistics 2012–2013  
  
Teaching Assistant, Department of Biostatistics, Harvard University 2013  
BIO210: Analysis of rates and proportions 2013  
BIO287: Public health surveillance 2012  
BIO507: Quantitative methods for monitoring & evaluation 2012  
BIO206: Introductory statistics for medical research 2010–2011  
BIO201: Introduction to statistical methods

## PUBLICATIONS

### Refereed Journal Articles

**Dean NE**, Halloran ME, Longini IM. Design of Vaccine Trials during Outbreaks with and without a Delayed Vaccination Comparator. In press at *Annals of Applied Statistics*.

Gsell P, Camacho A, Kucharski A, Watson CH, Bagayoko A, Danmadji S, **Dean NE**, Diallo A, Djidonou H, Doumbia M, Fallah M, Enwere G, Higgs ES, Mauget T, Mory D, Riveros X, Thierno Oumar F, Toure A, Vicari AS, Longini IM, Edmunds WJ, Henao-Restrepo AM, Kéïta S. Ring vaccination of adults and children with rVSV-ZEBOV in response to an outbreak of Ebola virus disease in Guinea, 2016: an operational and vaccine safety report. *Lancet Infectious Diseases* 17(12): 1276-1284.

Wilder-Smith A, Longini I, Zuber P, Bärnighausen T, Edmunds WJ, **Dean NE**, Masseray-Spicher V, Benissa MR, Gessner BG (2017). The public health value of vaccines beyond efficacy: methods, measures and outcomes. *BMC Medicine* 15: 138.

Zhang Q, Sun K, Chinazzi M, Pastore-Piontti A, **Dean NE**, Rojas DP, Merler S, Mistry D, Poletti P, Rossi L, Bray M, Halloran ME, Longini IM, Vespignani A (2017). Spread of Zika virus in the Americas. *Proceedings of the National Academy of Sciences* 114(22): E4334-E4343.

Henao-Restrepo AM, Camacho A, Longini IM, Watson CH, Edmunds WJ, Egger M, Carroll MW, **Dean NE**, Doumbia M, Draguez B, Duraffour S, Enwere G, Grais R, Gunther S, Gsell PS, Hossmann S, Kondé MK, Kéïta S, Kone S, Kuisma E, Levine M, Mandal S, Mauget T, Norheim G, Rivreros X, Soumah A, Trelle S, Vicari AS, Røttingen J-A, Kieny MP (2017). Efficacy and effectiveness of an rVSV-vectored vaccine in preventing Ebola virus disease: final results from the Guinea ring vaccination, open-label, cluster-randomised trial (Ebola Ça Suffit!). *The Lancet* 389(10068): 505-518.

Mutenda N, Bukowski A, Nitschke AM, Nakanyala T, Hamunime N, Mekonen T, Tjituka F, Mwinga S, Mazibuko G, Mabirizi D, Sagwa E, **Dean N**, Jordan MR, Hong SY (2016). HIV Drug Resistance Early Warning Indicators in Main and Decentralized Outreach Antiretroviral Therapy Sites in Namibia. *PLoS ONE* 11(12): e0166649.

Merler S, Ajelli M, Fumanelli L, Parlamento S, Pastore Y Piontti, **Dean NE**, Putoto G, Carraro D, Longini IM, Halloran ME, Vespignani A (2016). Containing Ebola at the source with ring vaccination. *PLoS Neglected Tropical Diseases* 10(11): e0005093.

Ajelli M, Merler S, Fumanelli L, Pastore Y Piontti A, **Dean NE**, Longini IM, Halloran ME, Vespignani A (2016). Spatiotemporal dynamics of the Ebola epidemic in Guinea and implications for vaccination and disease elimination: a computational modeling analysis. *BMC Medicine* 14: 130.

Rojas DP, **Dean NE**, Yang Y, Kenah E, Quintero J, Tomasi S, Ramirez EL, Kelly Y, Castro C, Carasquilla G, Halloran ME, Longini IM (2016). The epidemiology and transmissibility of Zika virus in Girardot and San Andres Island, Colombia, September 2015 to January 2016. *Eurosurveillance* 21(28): pii=30283.

**Dean NE**, Halloran ME, Yang Y, Longini IM (2016). Transmissibility and Pathogenicity of Ebola Virus: A Systematic Review and Meta-analysis of Household Secondary Attack Rate and Asymptomatic Infection. *Clinical Infectious Diseases* 62(10): 1277-1286.

Fang LQ, Yang Y, Jiang JF, Yao H, Kargbo D, Li X, Jiang BG, Kargbo B, Tong YG, Wang YW, Liu K, Kamara A, Dfafe F, Kanu A, Jiang RR, Sun Y, Sun RX, Chen WJ, Ma M, **Dean NE**, Thomas H, Longini IM, Halloran ME, Cao WC (2016). Transmission Dynamics of Ebola Virus Disease and Intervention Effectiveness in Sierra Leone. *Proceedings of the National Academy of Sciences* 113(16):

4488-4493.

**Dean NE**, Pagano M (2015). Evaluating Confidence Interval Methods for Binomial Proportions in Clustered Surveys. *Journal of Survey Statistics and Methodology* 3(4): 484-503.

Henao-Restrepo A-M, Longini IM, Egger M, **Dean NE**, Edmunds WJ, Camacho A, Carroll MW, Doumbia M, Duraffour S, Enwere G, Grais R, Gunther S, Hossmann S, Kondé MK, Kone S, Kuisma E, Levine M, Mandal S, Norheim G, Riveros X, Soumah A, Trelle S, Vicari AS, Watson CH, Draguez B, Kéïta S, Røttingen J-A, Kieny M-P (2015). Efficacy and effectiveness of an rVSV-vectored vaccine expressing Ebola surface glycoprotein: interim results from the Guinea ring vaccination cluster-randomised trial. *The Lancet* 386(9996): 857-866. *\*International Society for Vaccines 2015 Paper of the Year.*

Ebola ça suffit ring vaccination trial consortium (coauthor **Dean NE**) (2015). The ring vaccination trial: a novel cluster randomised controlled trial design to evaluate vaccine efficacy and effectiveness during outbreaks, with special reference to Ebola. *British Medical Journal* 351: h3740.

Russo GS, Ferrucci AM, Miller CP, Dean EW, Strohhorn GW, **Dean NE**, Sharkey MS (2015). Factors associated with the transfer of pediatric patients with supracondylar humerus fractures to a level I pediatric trauma center. *Connecticut Medicine* 79(8): 461-466.

Galler JR, Bryce CP, Zichlin ML, Waber DP, **Exner N**, Fitzmaurice GM, Costa PT (2013). Malnutrition in the first year of life and personality at age 40. *Journal of Child Psychology and Psychiatry* 54(8): 911-919.

Galler JR, Bryce CP, Waber D, Hock RS, **Exner N**, Eaglesfield D, Fitzmaurice G, Harrison R (2010). Early childhood malnutrition predicts depressive symptoms at ages 11-17. *Journal of Child Psychology and Psychiatry* 51(7): 789-798.

## Other Publications

World Health Organization (lead author **Dean NE**) (2017). Informing Vaccination Programs: A Guide to the Design and Conduct of Dengue Serosurveys. <http://www.who.int/immunization/research/development/dengue-serosurveys/en/>

**Dean NE**, Vespignani A, Halloran ME, Longini IM, Halloran ME (2016). Zika virus: only a few small outbreaks likely to occur in the continental US. *The Conversation*. <http://theconversation.com/zika-virus-only-a-few-small-outbreaks-likely-to-occur-in-the-continental-us-64719>

World Health Organization (coauthor **Dean NE**) (2016). Global report on early warning indicators of HIV drug resistance: Technical report. <http://www.who.int/hiv/pub/drugresistance/ewi-hivdr-2016/en/>

Longini IM, Egger M, **Dean NE**, Edmunds WJ, Henao-Restrepo AM, on behalf of the study steering group (2015). Ebola vaccination – Authors’ reply. *The Lancet* 386(10012): 2480.

World Health Organization (coauthor **Dean NE**) (2014). HIV Drug Resistance Concept Note – Surveillance of HIV drug resistance in adults initiating antiretroviral therapy (pretreatment HIV drug resistance). <http://www.who.int/hiv/topics/drugresistance/protocols/en/>

World Health Organization (coauthor **Dean NE**) (2014). HIV Drug Resistance Concept Note – Surveillance of HIV drug resistance in adults receiving antiretroviral therapy (acquired HIV drug resistance). <http://www.who.int/hiv/topics/drugresistance/protocols/en/>

## Submitted Manuscripts

**Dean NE**, Longini IM, Brookmeyer R, Donnelly CA, Halloran ME, Gsell PS, Horby PW, Nason MC, De Gruttola V. Combining evidence from randomized clinical trials across outbreaks. Submitted to *Science Translational Medicine*.

**Dean NE**, Gsell PS, Brookmeyer R, De Gruttola V, Donnelly CA, Halloran ME, Jasseh M, Nason M, Riveros X, Watson C, Henao-Restrepo AM, Longini IM. Considerations for the design of vaccine efficacy trials during public health emergencies. Submitted to *Science Translational Medicine*.

Bellan SE, Eggo RM, Gsell PS, Kucharski A, **Dean NE**, Donohue R, Zook M, Odhiambo F, Longini I, Brisson M, Mahon B, Henao-Restrepo AM. Guiding Vaccine Efficacy Trial Design During Public Health Emergencies: An interactive web-based decision support tool. Submitted to *Science Translational Medicine*. <https://doi.org/10.1101/252783>

Ajelli M, Chinazzi M, Gsell PS, Merler S, Camacho A, Bellan SE, Eggo RM, Kucharski AJ, Brisson M, **Dean NE**, Pastore-Piontti A, Sun K, Zhang Q, Edmunds WJ, Henao-Restrepo AM, Halloran ME, Longini IM, Vespignani A. Guiding Vaccine Efficacy Trial Design During Public Health Emergencies: a computational platform for exploring transmission models and vaccine trial design simulations. Submitted to *Science Translational Medicine*.

**Dean NE**, Watson CH, Camacho A, Mandal S, Enwere G, Riveros X, Norheim G, Edmunds WJ, Egger M, Henao-Restrepo AM, Longini IM. The Ebola ring vaccination trial: design and analysis. Submitted to *Vaccine*.

**Dean NE**, Wu JW, Pagano M. A Modified Entropy Approach for Measuring Population Diversity: An Application in a Cross-Sectional HIV-1 Incidence Assay. Revision invited by *Emerging Themes in Epidemiology*.

## Software & Technical Tools

World Health Organization (developed by **Dean NE**) (2014). Excel-based sample size calculators to design pre-treatment HIV drug resistance (PDR) surveys.

World Health Organization (developed by **Dean NE**) (2014). Excel-based sample size calculators to design acquired HIV drug resistance (ADR) surveys.

World Health Organization (developed by **Dean NE**) (2014). Excel-based sample size calculators to design concurrent PDR and ADR surveys. <http://www.who.int/hiv/topics/drugresistance/protocols/en/>

## HONORS AND AWARDS

Travel Award Recipient, Women in Statistics and Data Science Conference, National Science Foundation	2016
Winner, Edward C. Bryant scholarship for an outstanding student in survey statistics, American Statistical Association	2013
Honorable Mention, Gertrude M. Cox scholarship for women students in statistics, American Statistical Association	2013
Recipient, Department of Biostatistics Certificate of Distinction in Teaching, Harvard University	2012
Overall and Student Winner, Modeling & Prediction RAB Poster Award, ENAR Spring Meeting, Washington DC	2012

Winner, John E. Alman Award in Statistics, Department of Mathematics & Statistics, Boston University	2009
Inductee, Phi Beta Kappa Society, Boston University	2009
College Scholar, College of Arts & Sciences, Boston University	2008
Distinguished Sophomore, College of Arts & Sciences, Boston University	2006

## FUNDING

Methods for Evaluating Vaccine Efficacy, R37, NIAID/NIH	2015-Present
Design and Analysis of Vaccine Trials for Emerging Infectious Disease Threats, WHO (Principal Investigator)	2017
Dengue Vaccine Seroprevalence Surveys, WHO (Principal Investigator)	2016-2017
Design, Analysis, and Implementation of Ebola Vaccine Studies in West Africa, WHO	2015-2016
Accurate and Efficient Measures for HIV Incidence, R01, NIAID/NIH	2013-2014
Biostatistics/Epidemiology Training Grant in AIDS, T32, NIH	2009-2013
Summer Institute in Statistics & Modeling in Infectious Diseases Scholarship and Travel Award, University of Washington	2010
Trustee Scholarship (full-tuition merit-based scholarship), Boston University	2005-2009
Corporate National Merit Scholarship, Osram Sylvania	2005-2009
Undergraduate Research Opportunities Program Grant, Boston University	2008

## PRESENTATIONS

### Conference Invited Seminars

“Risk estimates of microcephaly and other birth defects from prospective Zika cohorts.” MIDAS Network Meeting, Reston, VA	2016
“Evaluating Ebola vaccine Efficacy under Outbreak Conditions using a Ring Vaccination Trial Design.” ENAR Spring Meeting, Austin, TX	2016

### Conference Contributed Seminars

“Design Considerations for Vaccine Efficacy Trials in Outbreak Settings.” Joint Statistical Meetings, Chicago, IL	2016
“Analysis of an Ebola Vaccine Trial using a Ring Vaccination Design in Guinea, West Africa.” Epidemics 5, Clearwater, FL	2015
“Practical and Statistical Challenges in Developing an HIV Drug Resistance Surveillance Protocol.” ENAR Spring Meeting, Baltimore, MD	2014
“A Comparison of Methods for Estimating Confidence Intervals for Proportions in Clustered Surveys.” Joint Statistical Meetings, Montreal, Canada	2013

“Adapting Shannon’s Entropy to Strengthen Relationship between Time since HIV-1 Infection and Within-Host Viral Diversity.” ENAR Spring Meeting, Orlando, FL 2013

**Selected Other Presentations**

“Our Community, Our Health: Everything You Wanted to Know About Zika”  
- HealthStreet interactive town hall, University of Florida, Gainesville, FL 2017

“Recommended Guidelines for Dengue Serosurveillance.”  
- WHO Immunization and vaccines related implementation research advisory committee meeting (IVIR-AC), Annecy, France 2017

“Surveillance of Pre-Treatment & Acquired HIV Drug Resistance.”  
- Geneva, Switzerland 2015  
- Port of Spain, Trinidad and Tobago 2014  
- Brasilia, Brazil 2013  
- Kunming, China 2013

**PROFESSIONAL SERVICE**

Reviewer, *AIDS Research and Human Retroviruses; Biometrics; BMC Public Health; BMJ Open; Clinical Trials; Emerging Infectious Diseases; PLOS Neglected Tropical Diseases; Statistics in Medicine*

Organizer, CSQUID Working Group, University of Florida 2015–Present

Session Moderator, AAAS Annual Meeting, Boston, MA 2017

Judge, Florida Statewide Graduate Student Research Symposium, Gainesville, FL 2016

Judge, Three Minute Thesis (3MT), University of Florida 2016

Judge, Graduate Student Research Day, University of Florida 2015

Session Chair, ENAR Spring Meeting, Orlando, FL 2013

Co-Coordinator, HIV Working Group Seminar Series, Department of Biostatistics, Harvard University 2012–2013

Chair, Department of Biostatistics Student Committee, Harvard University 2012–2013

Member, Department of Biostatistics Student Committee, Harvard University 2009–2012

Coordinator, McGoldrick Fellowship Reading Group, Harvard University 2011–2012

**PROFESSIONAL AFFILIATIONS**

American Statistical Association 2012–Present

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