

# VARUN GOEL

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## CURRENT POSITION

current  
|  
2021

- **Postdoctoral Research Associate**

Carolina Population Center, University of North Carolina

 Chapel Hill, NC

## EDUCATION

2021  
|  
2016

- **PhD, Geography**

University of North Carolina

 Chapel Hill, NC

- *Title : Are Deep Tubewells Safe and Equitable? A Geographic examination of Impacts of Deep Tubewell Interventions on Provision of Safe Drinking-water and Diarrheal Diseases in Rural Bangladesh*

2013  
|  
2011

- **M.S., Geography**

University of Illinois

 Urbana Champaign, IL

- Concentration in Health and Medical Geography

2011  
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2008

- **B.A. (hons), Geography (minor C.S.)**

University of Illinois

 Urbana Champaign, IL

- Concentration in Geographic Information Science
- Awarded Highest Distinction

## RESEARCH EXPERIENCE

2021  
|  
2016

- **Carolina Population Center**

University of North Carolina

- Conducted population health research on multiple NSF and NIH Projects as a pre-doctoral trainee
- Lead and co-authored multiple peer-reviewed publications evaluating spatial determinants of diarrheal diseases in Bangladesh and malaria in Sub-Saharan Africa under supervision of [Dr. Mike Emch](#).
- Conducted analysis and wrote a submitted manuscript with [Dr. Paul Delamater](#) on spatial determinants of vaccine hesitancy in the United States

2016  
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2014

- **Indian School of Business**

Hyderabad, India

- I served as the chief data scientist at a research team led by [Dr. Ashwini Chhatre](#) to acquire, process, integrate, visualize and disseminate data-driven products for evidence based resilient rainfed agriculture in India

2013  
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2012

- **Center for One Health**

University of Illinois

- Conducted Master's research involving a spatial risk assessment of Epizootic Hemorrhagic Disease among cattle and white-tailed deer in Illinois under supervision of late [Dr. Marilyn O'Hara Ruiz](#)

2011  
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2010

- **CyberGIS and Infrastructure Laboratory**

University of Illinois

- Co-led the development of an Ecological Compliance Assessment WebGIS tool named *EcoCAT* at the Illinois Department of Natural Resources under supervision of [Dr. Shaowen Wang](#)



## PEER REVIEWED PUBLICATIONS

2022

- **Race, Place, and HIV: The Legacies of Apartheid and Racist Policy in South Africa**

*Social Science and Medicine*

- GJ Bell, J Ncyayiyana, A Sholomon, **V Goel**, K Zuma, M Emch

2022

- **Implementation Approaches for Introducing and Overcoming Barriers to Hepatitis B Birth-Dose Vaccine in Africa**

*Global Health: Science and Practice*

- Boisson A, V Goel, Yotebiang M, Parr JB, B Fried, Thompson P

2021

- **Dihydroartemisinin-piperaquine chemoprevention and malaria incidence after severe flooding: evaluation of a pragmatic intervention in rural Uganda**

*Clinical Infectious Diseases*

- RM Boyce, BD Hollingsworth, E Baguma, E Xu, **V Goel**, A Brown-Marusiak, R Muhindo, R Reyes, M Ntaro, MJ Siedner, SG Staedke, JJ Juliano, EM Mulongo

2021

- **Malaria prevalence and long-lasting insecticidal net use in rural western Uganda: results of a cross-sectional survey conducted in an area of highly variable malaria transmission intensity**

*Malaria Journal*

- CM Cote, V Goel, R Muhindo, E Baguma, M Ntaro, BE Shook-Sa, R Reyes, SG Staedke, EM Mulongo, RM Boyce

2021

- **Individual, household and neighborhood risk factors for malaria in the Democratic Republic of the Congo support new approaches to programmatic intervention**

*Health and Place*

- M Carrel, S Kim, MK Mwandagalirwa, N Mvuama, JA Bala, M Nkalani, G Kihuma, J Atibu, O Diallo, **Varun Goel**, KL Thwai, JJ Juliano, M Emch, A Tshefu, JB Parr

2021

- **SARS-CoV-2 testing in North Carolina: Racial, ethnic, and geographic disparities**

*Health and Place*

- K Brandt\*, V Goel\*, C Keeler\*, GJ Bell, A Aiello, G Corbie-Smith, E Wilson, A Fleischauer, M Emch, RM Boyce

\* Joint first author

- 2021
- Effectiveness of a national mass distribution campaign of long-lasting insecticide-treated nets and indoor residual spraying on clinical malaria in Malawi, 2018–2020  
*BMJ Global Health*  
 • H Topazian, A Gumbo, K Brandt, M Kayange, JS Smith, JK Edwards, V Goel, T Mvalo, M Emch, A Pettifor, JJ Juliano, I Hoffman
- 2021
- What is the burden of malaria in the DRC  
*Journal of Infectious Diseases*  
 • M Deutsch-Feldman, JB Parr, C Keeler, NF Brazeau, V Goel, M Emch, JK Edwards, M Kashamuka, AK Tshefu, SR Meshnick
- 2020
- Considering Alternate Pathways of Drinking-Water Contamination: Evidence of Risk Substitution in Rural Bangladesh  
*International Journal of Environmental Research and Public Health*  
 • V Goel, GJ Bell, S Sridhar, Md Islam, Md Yunus, Md Ali, Md Khan, Md Alam, ASG Faruque, Md Kabir, S Babu, K Brandt, V Shelus, MD Sobsey, M Emch
- 2019
- Extending multilevel spatial models to include spatially varying coefficients  
*Health and Place*  
 • M Janko, V Goel, M Emch
- 2019
- False-negative malaria rapid diagnostic test results and their impact on community-based malaria surveys in sub-Saharan Africa  
*BMJ Global Health*  
 • OJ Watson, KM Sumner, M Janko, V Goel, P Winskill, HC Slater, A Chani, SR Meshnick, JB Parr
- 2019
- Impacts of household sources on air pollution at village and regional scales in India  
*Atmospheric Chemistry and Physics*  
 • B Rooney, R Zhao, Y Wang, KH Bates, A Pillarisetti, S Sharma, S Kundu, TC Bond, NL Lam, B Ozaltun, L Xu, V Goel, LT Fleming, R Weltman, S Meinardi, DR Blake, SA Nizkorodov, RD Edwards, A Yadav, NK Arora, KR Smith, JH Seinfeld
- 2018
- Deep tubewell microbial water quality and access in arsenic mitigation programs in rural Bangladesh  
*Science of the Total Environment*  
 • V Goel, MS Islam, M Yunus, MT Ali, AF Khan, N Alam, ASG Faruque, G Bell, M Sobsey, M Emch
- 2017
- Individual and household characteristics of persons with Plasmodium falciparum malaria in sites with varying endemicities in Kinshasa Province, Democratic Republic of the Congo  
*Malaria Journal*  
 • MK Mwandagalirwa, L Levitz, KL Thwai, JB Parr, Varun Goel, M Janko, A Tshefu, M Emch, SR Meshnick, M Carrel

## MANUSCRIPTS UNDER REVIEW

- 2022 • Malaria Transmission Intensity Likely Modifies RTS,S/AS01 Efficacy Due to a Rebound Effect in Ghana, Malawi, and Gabon  
*Lancet Infectious Diseases* (submitted)  
• GJ Bell, V Goel, B Adu, BA Mensah, S Gyaase, F Mougeni, K Wiru, C Sinai, P Essone, D Dosoo, M Osei, P Minsoko, K Niare, JJ Juliano, M Hudgens, P Kamthunzi, ST Agnandji, KP Asante, A Ghansah, JA Bailey, M Emch
- 2022 • Associations between Deep Tubewell Use and Household Microbial Contamination: A Prospective Cohort Study among Households in Rural Bangladesh  
*International Journal of Hygiene and Environmental Health* (submitted)  
• V Goel, B Chan, M Ziade, MS Islam, Md Yunus, MT Ali, AF Khan, N Alam, ASG Faruque, SU Babu, MM Kabir, M Sobsey, M Serre , M Emch
- 2022 • Provisional entrance, exemptions, and kindergarteners up-to-date on vaccination after a regulatory change in Pennsylvania  
*Public Health Reports* (under review)  
• PL Delamater, V Goel, CN Strack, YT Yang

## BOOK CHAPTERS

- 2021 • Spatial Epidemiology: Challenges and methods in COVID-19 research  
*In: Andrews G.J., Crooks V.A., Pearce J.R., Messina J.P. (eds) COVID-19 and Similar Futures. Global Perspectives on Health Geography. Springer*  
• V Goel, M Emch

## SELECTED CONFERENCE PRESENTATIONS

- 2021 • Investigating COVID-19 Testing in North Carolina: Racial, Ethnic, and Geographic Disparities  
*Association of American Geographers, April 7-11* (non presenting author)  Virtual
- 2021 • Spillovers and Risk Substitution in Public Health Interventions: A case study of Deep Tubewell Interventions and Diarrheal Disease in Rural Bangladesh  
*Association of American Geographers, April 7-11*  Virtual
- 2020 • Are Deep Tubewells Safe Drinking Water Sources? Evidence of Risk Substitution from Rural Bangladesh  
*UNC Water and Health Conference, Oct 26-30*  Chapel Hill, USA
- 2019 • Measuring spillover effects from a health intervention in Rural Bangladesh  
*International Medical Geography Symposium, July 1-6*  Queenstown, NZ
- 2019 • Climatic Influences on Women's Health and Mobility in Sub-Saharan Africa  
*Population Association of America, April 11-13* (non-presenting author)  Austin, USA
- 2019 • Risk Substitution through Surface Water Use Among Deep Tubewell users in Rural Bangladesh  
*Association of American Geographers, April 4-7*  Washington D.C, USA

- |      |                                                                                                                                                                                                                      |                    |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 2018 | ● Does Women's Empowerment Reduce the Negative Effect of Climate Change on Child Health? Empirical Evidence from Households in India<br><i>Population Association of America, April 26-28</i>                        | 📍 Denver, USA      |
| 2018 | ● Impact of Population Modelling Choices on Epidemiological Estimates: Implications for Integrated Disease Control<br><i>American Society for Tropical Medicine and Hygiene, Oct 28-30</i> , (non-presenting author) | 📍 New Orleans, USA |
| 2017 | ● Finding Safe Drinking Water in Rural Bangladesh - Are Deep Tubewells the Answer?<br><i>Association of American Geographers, April 10-14</i>                                                                        | 📍 New Orleans, USA |
| 2013 | ● An integrated One Health approach to evaluating the spatio-temporal risk of hemorrhagic disease in cattle in Illinois<br><i>URISA GIS and Public Health Conference, Jun 10-12</i>                                  | 📍 Miami, USA       |
| 2013 | ● A spatial risk assessment of hemorrhagic disease in cattle in Illinois from 2005 to 2012,<br><i>Association of American Geographers, April 22-25</i>                                                               | 📍 Los Angeles, USA |
| 2011 | ● IMAP: An online GIS tool for disability-friendly pedestrian navigation<br><i>Illinois GIS Association Spring Conference, April 1</i>                                                                               | 📍 Los Angeles, USA |

## INVITED TALKS AND PANELS

- |      |                                                                                                                                                              |                                 |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| 2020 | ● <b>Spatial and demographic patterns in SARS-CoV-2 testing and test positivity in North Carolina</b><br>Geography Colloquium (Co-presented), Nov 10         | 📍 Dartmouth College             |
| 2020 | ● <b>SARS-CoV-2 Testing in North Carolina: Racial, ethnic, and geographic disparities</b><br>Working Group Seminar (Co-presented), Nov 19                    | 📍 NC Covid Surveillance Network |
| 2020 | ● <b>Building Resilience in Water, Sanitation and Hygiene Systems in Developing Countries</b><br>STAR-TIDES Invited Panel Speaker, Oct 20                    | 📍 George Mason University       |
| 2020 | ● <b>Spatial Components of COVID-19 viral and seroprevalence testing in North Carolina</b><br>School of Forest and Environment Resources Seminar, Oct 19     | 📍 NC State University           |
| 2018 | ● <b>Examining the Role of Neighborhood Definitions on Spatio-temporal Distribution of Vaccine Refusal in California</b><br>GIS Day Invited talk, Nov 16     | 📍 Duke University               |
| 2018 | ● <b>Evaluating Deep Tubewell interventions in rural Bangladesh: Implications for both drinking and non-drinking water usage</b><br>Research Seminar, Sep 25 | 📍 icddr,b Bangladesh            |
| 2018 | ● <b>Mapping Infectious Diseases using R</b><br>Workshop at the <i>Evolutionary Medicine Summer Institute</i> , June 7                                       | 📍 Duke University               |
| 2017 | ● <b>Globalization and Health</b><br>Guest Lecture, GEOG 110: Geographies of Globalization, Oct 13                                                           | 📍 UNC Chapel Hill               |
| 2017 | ● <b>Morbidity and Health</b><br>Guest Lecture: Soc 122: Population and Development, March 28                                                                | 📍 UNC Chapel Hill               |
| 2013 | ● <b>Applications of GIS in Natural Resource Management</b><br>Guest Lecture: Natural Resource Governance in Developing Countries, Oct 29                    | 📍 University of Illinois        |
| 2012 | ● <b>Open-source GIS tools in criminology and health</b><br>Guest Lecture: Geospatial Tech and Society                                                       | 📍 University of Illinois        |

## TEACHING EXPERIENCE

2020  
spring

- **Course Instructor**  
*GEOG 215: Introduction to Spatial Data Science*

 University of North Carolina Chapel Hill

- Rated 4.85 out of 5 (Full course evaluations available upon request)

2013  
spring

- **Teaching Assistant**  
*GEOG 105: Digital Earth*

 University of Illinois, Urbana Champaign

- Mentioned in *List of Instructors rated as Excellent by their students*

2011 fall

- **Teaching Assistant**  
*GEOG 101: Geography of Developing Countries*

 University of Illinois, Urbana Champaign

- Mentioned in *List of Instructors rated as Excellent by their students*

## OTHER TEACHING EXPERIENCE

2020  
March

- **Course Instructor**  
*Introduction to GIS and Spatial Analysis*

 Lilongwe, Malawi

- Co-taught a short course on Introduction to GIS and Spatial Analysis to doctors and public health researchers as part of the Malawi HIV Implementation and Research Training Program

2020  
december

- **Teaching Assistant**  
*Data Matters Workshop Series*

 University of North Carolina Chapel Hill

- TA for 3 two-day classes on Introductory, Intermediate and Advanced R

## AWARDS, HONORS & FUNDING

- 2020 UNC Graduate School Dissertation Completion Fellowship (\$18,000)
- 2020 Melinda Meade Research Award, UNC Geography (\$3000)
- 2019 Melinda Meade Graduate Student Summer Award, UNC Geography (\$2000)
- 2019 AAG Health and Medical Geography Specialty Group Travel Award (\$500)
- 2018 Ona Impact Grant for using innovative digital technology for field data collection (\$1200)
- 2018 Geography Summer Award, UNC Geography (\$3000)
- 2018 Summer Institute in Statistics and Infectious Disease Modeling scholarship, UW (\$3300)
- 2016 UNC Doctoral Recruitment Merit Assistantship (\$20,000)
- 2013 Schlesinger Travel Award, UIUC School of Earth, Society and Environment (\$600)
- 2011 Jerome D Fellman Award, for outstanding honors thesis and highest distinction
- 2011 Outstanding Senior in Geography Award, Illinois Geographical Society
- 2011 ESRI Development Center (EDC) Scholarship, ESRI (co-shared) (\$500)
- 2011 1867 Society Fund Award, UIUC (shared) (\$1100)

- 2011 • Howard Roepke Undergraduate Research Scholarship, UIUC Geography (\$3000)

## SKILLS

- **Analytical**

GIS, remote sensing, spatial statistics, geostatistical modeling

- **Programming**

R (*advanced*), Python, Matlab, Bash

- **Software/Tools**

R, ArcGIS, QGIS, Stata, GIT, AWS, PostGIS

## DEPARTMENTAL SERVICE

2020 • **Treasurer**

Geography Association of Graduate Students

📍 University of North Carolina Chapel Hill

2017 • **Graduate Student Representative, Geography**

Graduate Professional Student Federation

📍 University of North Carolina Chapel Hill

2013 • **Chair**

Society of Earth Systems and Environment Research Review

📍 University of Illinois, Urbana Champaign

## REVIEWER ASSIGNMENTS

- Health & Place

- Malaria Journal

- Bulletin of the World Health Organization

- Science of the Total Environment

- American Journal of Public Health

## MEMBERSHIP IN PROFESSIONAL SOCIETIES

- Association of American Geographers

- Population Association of America

- American Society of Tropical Medicine and Hygiene

## LANGUAGES

- **English**

Fluent

- **Hindi**  
Native Speaker
- **Mandarin**  
Conversational