CHAITRA GOPALAPPA, PH.D.
Assistant Professor, Industrial Engineering and Commonwealth Honors College
Mechanical and Industrial Engineering, University of Massachusetts Amherst, MA
Phone: (413) 545 2306; e-mail: chaitrag@umass.edu

EDUCATION

INSTITUTION	DEGREE	YEAR	FIELD OF STUDY
Centers for Disease Control and Prevention, Atlanta, GA	Post-Doctoral	2012	Decision Sciences and Public Health
University of South Florida, Tampa, FL	Ph.D.	2010	Industrial Engineering Advisor: Tapas K. Das
University of South Florida, Tampa, FL	MS	2006	Industrial Engineering
Visveshwaraiah Technological University, India	BS	2002	Industrial Engineering

WORK EXPERIENCE

2014-present	Assistant Professor, Industrial Engineering and Honors College, Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst, MA
2012-2014	Senior Modeler and Analyst, Center for Modeling and Policy Analysis, Futures Institute, Glastonbury, CT
2010-2012	Steven M. Teutsch Prevention Effectiveness Post-doctoral fellow, US Centers for Disease Control and Prevention (CDC), Atlanta, GA
2005-2010	Teaching/Research Assistant, University of South Florida, Tampa, FL

HONORS

2016	Invited talk, National Academy of Sciences' Kavli Frontiers of Science fellow
2011	Pritsker Doctoral Dissertation Award, Institute of Industrial Engineers, 3rd Place
2010	Finalist presentation, Pierskalla Best Paper Award, Institute for Operations Research and Management Sciences (INFORMS)
2009	Graduate Student Challenge Grant, University of South Florida
2008	Summer researcher, Cancer Care Engineering project, Purdue University Funded by Regenstrief Foundation, Purdue University

RESEARCH METHODOLOGIES

- Simulation-based modeling (discrete-event, micro-simulation, agent-based network modeling, differential equations)
- Parametric and stochastic control optimizations (Markov Decision Processes, Reinforcement Learning, Response surfaces, simultaneous perturbation stochastic approximation)
- Stochastic processes (Discrete-time Markov chain, Continuous-time Markov processes)

RESEARCH AREA OF INTEREST

Data and decision analytics of disease prevention strategies to inform resource allocation decisions in public health.

RESEARCH FUNDING

1. 7/ 15/2017 – 6/30/2022
   Project Title: Evaluating Portfolio Interventions for HIV Incidence Reduction in the United States: Development of a Novel Agent-Based Decision-Analytic Model for Dynamic Evaluations of Interventions
   Principal Investigator: Chaitra Gopalappa
   Sponsor: R01, National Institute Of Allergy And Infectious Diseases, National Institutes of Health (NIH) (R01AI127236)
   Amount: $1,567,348

2. 1/1/2018- 12/31/2018
   Parameterization of cancer progression model for regions of South America to inform national cancer screening guidelines
   Sponsor: Pan American Health Organization (PAHO)
   PI: Avenir Health;
   UMass Subcontract PI: Chaitra Gopalappa,
   Amount: $12,088

3. 1/1/2015 – 8/30/2015
   Models for informing breast cancer screening in low and middle income countries,
   Sponsor: World Health Organization (WHO);
   PI: Avenir Health;
   UMass Subcontract PI: Chaitra Gopalappa,
   Amount: $34,661

4. 8/1/2015 – 1/1/2016
   Models for informing colorectal and cervical cancer screening in low and middle income countries,
   Sponsor: World Health Organization (WHO);
   PI: Avenir Health;
   UMass Subcontract PI: Chaitra Gopalappa,
   Amount: $9,094

Other funding

5. December 2-4, 2016
   Travel grant: Invited talk, US speaker in New Directions in Mathematical Epidemiology, US-Japan Kavli Frontiers of Science symposium, California
   Sponsor: The U.S. National Academy of Sciences

6. August 5- August 12, 2017
   Travel grant for invited research meeting and lecture at the Infectious Diseases Modeling summer program, Institute for Mathematical Statistics, Tokyo, Japan, August 1- August 12, 2017
   Sponsor: Japan Society for the Promotion of Sciences

KEY POLICY IMPACTS OF OUR RESEARCH WORK

1. Findings from cancer modeling work used in updating cancer screening guidelines in the Appendix 3 of the Global Action Plan for Non-Communicable Diseases submitted by the WHO Director General to the 70th World Health Assembly, May 2017
   - World Health Organization, Cancer Interventions Technical Briefing For The Updated (2017) Appendix 3 Of The Global Action Plan For The Prevention And Control Of Noncommunicable Diseases 2013-2020, http://who.int/ncds/governance/Cancers-FINAL-18May.pdf?ua=1

   - World Health Organization, 'Best buys' and other recommended interventions for the prevention and control of noncommunicable diseases, Updated (2017) appendix 3 of the global action plan for the prevention and control of noncommunicable diseases 2013-2020, http://who.int/ncds/management/WHO_Appendix_BestBuys.pdf?ua=1

2. Published results from HIV work noted as two Key Points in CDC's (Centers for Disease Control and Prevention) Vital Signs report (cited below) to inform testing and diagnosis practices for the United States.
   - Dailey AF, Hoots BE, Hall HI, et al. Vital Signs: Human Immunodeficiency Virus Testing and Diagnosis Delays — United States. MMWR Morbidity and Mortality Weekly Report. Dec 2017;66(47):1300-1306. doi:10.15585/mmwr.mm6647e1

3. Published results from HIV work, on transmissions among men who have sex with men and women, used in CDC's initial analysis (cited below) on these transmissions for 'What we know and how to prevent it'
   - McCree, D.H., et. al., 'HIV acquisition and transmission among men who have sex with men and women: What we know and how to prevent it', Preventive Medicine, Volume 100, April 2017, Pages 132-134.

PUBLIC HEALTH GUIDELINES THAT HAVE CITED OUR PUBLISHED WORK

- [7,8] Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV, The World Health Organization, September 2015, http://apps.who.int/iris/bitstream/10665/186275/1/9789241509565_eng.pdf

- [12] National HIV AIDS Strategy for the United States: Update to 2020, The White House, July 2015 https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf

- [12] Fiscal Year 2017 Justification of Estimates for Appropriation Committees, CDC, DHHS, HIV budget- pgs 467-480 https://www.cdc.gov/budget/documents/fy2017/fy-2017-cdc-congressional-justification.pdf

- [14] Guidelines for conducting HIV surveillance among pregnant women attending antenatal clinics based on routine programme data, World Health Organization, August 2015 http://apps.who.int/iris/bitstream/10665/197864/1/9789241509725_eng.pdf

- [3] Dailey AF, Hoots BE, Hall HI, et al. Vital Signs: Human Immunodeficiency Virus Testing and Diagnosis Delays — United States. MMWR Morb Mortal Wkly Rep 2017;66:1300–1306. DOI: http://dx.doi.org/10.15585/mmwr.mm6647e1

REFEREED JOURNAL PUBLICATIONS (*students)

1. Gopalappa, C., Guo*, J., Meckoni*, P., Munkhbat*, B., Carel Pretorius, Jeremy Lauer, André Ilbawi, Melanie Bertram, A two-step Markov processes approach for parameterization of cancer state-transition models for low- and middle- income countries, **Medical Decision Making, In Press**

2. Gopalappa, C., Farnham, P.G., Chen, Y-H., and Sansom, S.L. Combinations of interventions to achieve a national HIV incidence reduction goal: insights from an agent-based model. **AIDS**, November 28, 2017 - Volume 31 - Issue 18 - p 2533–2539

3. Gopalappa, C., Farnham, P.G., Chen, Y-H., and Sansom, S.L. Progression and Transmission of HIV/AIDS (PATH 2.0): A New Agent-Based Model to Estimate HIV Transmissions in the United States, **Medical Decision Making** 2017 Feb;37(2):224-233

4. Eaton, J., Bacaër, N., Bershteyn, A., Cambiano, V., Cori, A., Dorrington, R.E., Fraser, C., Gopalappa, C., Hontelez, J.A.C., Johnson, L.F., Klein, D.J., Phillips, A.N., Pretorius, C., Stover, J., Rehle, T.M., Hallett, T.B., Assessment of epidemic projections using recent HIV survey data in South Africa: a validation analysis of ten mathematical models of HIV epidemiology in the antiretroviral therapy era, The **Lancet Global Health**, Vol 3, e598, **October 2015**

5. Stover, J., Andreev, K., Slaymaker, E., Gopalappa, C., Sabin, K., Velasquez, C., Nakiyingi-Miiro, J., Crampin, A., Lutalo, T., Herbst, K., Gregson, S., and Urassa, M., Updates to the Spectrum model to estimate key HIV indicators for adults and children, **AIDS**, 28 (Suppl 4):S427–S434, September 2014

6. Stover, J., Hallett, T., Wu, Z., Warren, M., Gopalappa, C., Pretorius, C., Ghys, P.D., Montaner, J., Schwartländer, B.; New Prevention Technology Study Group, How can we go to Zero? The Potential Contribution of Biomedical Prevention and the Investment Framework towards an Effective Response to HIV, **PLoS One**, 9(11):e111956, November 2014

7. Stover, J., Gopalappa, C., Mahy, M., Doherty, M.C., Easterbrook, P.J., Weiler, G., and Ghys, P.D., The impact and cost of the 2013 WHO recommendations on eligibility for antiretroviral therapy, **AIDS**, 28 Suppl. 2:S225-30, March 2014

8. Gopalappa, C., Stover, J., Shaffer, N., and Mahy, M., The Costs and Benefits of Option B+ for the Prevention of Mother-to-Child Transmission of HIV, **AIDS**, 28 Suppl. 1:S5-14, Jan 2014

9. Pretorius, C., Menzies, N.A., Chindelevitch, L., Cohen, T., Cori, A., Eaton, J. A., Fraser, C., Gopalappa, C., Hallett, T. B., Salomon, J. A., Stover, J., White, R. G., Dodd, P. J., The potential effects of changing HIV treatment policy on TB outcomes in South Africa: results from three TB-HIV transmission models, **AIDS**, 28 Suppl 1:S25-34, Jan 2014

10. Eaton, J., Menzies, N., Stover, J., Cambiano, V., Chindelevitch, L., Cori, A., Hontelez, J. A. C., Humair, S., Kerr C. C., Klein, D J., Mishra, S., Mitchell, K. M., Nichols, B.E., Vickerman, V., Bakker, R., Barnighausen, T., Bershteyn, A., Bloom, D.E., Boily, M-C, Chang, S.T., Cohen, T., Dodd, P.J., Fraser, C., Gopalappa, C., Lundgren, J., Martin, N.K., Mikkelsen, E., Mountain, E., Pham, Q.D.,

Pickles, M., Phillips, A., Platt, L., Pretorius, C., Prudden, H.J., Salomon, J.A., van de Vijver, D.A.M.C., de Vlas, S. J., Wagner, B. G., White, R.G., Wilson, D.P., Zhang, L., Blandford, J., Meyer-Rath, G., Remme, M., Revill, P., Sangrujee, N., Terris-Prestholt, F., Doherty, M., Shaffer, N., Easterbrook, P.J., Hirnschall, G., Hallett, T.B., Health benefits, costs, and cost-effectiveness of earlier eligibility for adult antiretroviral therapy and expanded treatment coverage: a combined analysis of 12 mathematical models, **Lancet Global Health**, 2(1):e23, Jan 2014

11. Gopalappa, C., Huang, Y., Melanie, T., Kwame, O., and Gift, T., Cost-effectiveness of screening men in Maricopa County jails for chlamydia and gonorrhea to avert infections in women, **STD**, 40 (10):776-783, 2013

12. Farnham, P., Gopalappa, C., Sansom, S., Costs and effectiveness of early versus late treatment in view of recent guidelines for starting treatment at an earlier HIV stage, Division of HIV/AIDS Prevention, Centers for Disease Control and Prevention, **JAIDS,** 64(2):183-189, 2013.

13. Farnham, P.G., Holtgrave, D. R., Gopalappa, C., Angela B. Hutchinson, Stephanie L. Sansom, Lifetime Costs and QALYs Saved from HIV Prevention in the Test and Treat Era, Letter to the Editor, **JAIDS**, 64(2):e15-e18, 2013

14. Gopalappa, C., Stover, J., and Pretorius, C., HIV prevalence patterns by age: Exploring differences among 19 countries, **DHS Analytical Studies**, No. 40. Calverton, Maryland, USA: ICF International, 2013.

15. Gopalappa, C., Farnham, P., Hutchinson, A., and Sansom, S., Cost-effectiveness of the National HIV/AIDS Strategy (NHAS) goal of increasing the proportion linking to care at diagnosis, **JAIDS**, 61 (1):99-105, 2012.

16. Gopalappa, C., Cremaschi, S., Das, T., Orcun, S., Applied Probability Models for Estimating Progression Rates between Colorectal Cancer Stages, **Health Care Management Science** 14(1), March 2011: Pg 1-21

17. Gopalappa, C., Das, T., Enkemann, S., and Eschrich, S., Removal of Hybridization and Scanning Noise from Microarrays, **IEEE Transactions on Nanobioscience**, 8(3), 2009

TEACHING

- MIE 697: Simulation-based optimization, Spring 2016
- MIE290H Gen Ed (S&B, Global)): Infections and Social Determinants: Simulation modeling for Disease Prevention, Spring 2015, 2016, 2017, 2018
- MIE397H: Malaria, Cancer, Climate Change, Congestion and Social Trends: Simulation modeling for addressing world problems, Fall 2014, 2015, 2016
- MIE 353: Engineering Economic Decision Making, Fall 2017
- MIE 794: IE Graduate seminar (co-taught with Ana Muriel) 2014
- Probability and Statistics for Engineers
  University of South Florida, Summer 2009 (class size: ~60 with ~35 distance students)
  Probability and Statistics for Engineers
  University of South Florida, Spring 2009 (class size: ~110 students)