

Saurabh Mehta

Web Bio

Information

Biography

Biographical Statement

I am a physician with specific training and expertise in infectious disease, nutrition, and epidemiology. I have been extensively working in the area of infectious diseases, including HIV, Tuberculosis, and Neglected Tropical Diseases, in sub-Saharan Africa and South Asia, with recent work in Latin America, for more than a decade. This has encompassed both clinical and research activities focused on identifying means for primary prevention, early diagnostic modalities, and modifiable risk factors for reducing the risk of acquisition, transmission, and progression of disease. My research has identified a key role for vitamin D in infectious diseases, including reducing HIV disease progression and risk of HIV-related morbidities for the first time, and suggests vitamin D supplements could represent an inexpensive adjunct to conventional treatment. I have also published the results from the only randomized trial of micronutrient supplements among children between 6 weeks and 5 years of age with tuberculosis in sub-Saharan Africa demonstrating the safety of the supplements along with a significant effect on hemoglobin concentrations. I have also been a co-investigator on a large Gates foundation funded multi-country study for assessing human health status in low-income settings using verbal autopsy and novel diagnostics including proteomics for tuberculosis.

Teaching

Professional

Research

Current Research Activities

Since joining Cornell, my research group broadly focuses on the role of micronutrients in modulation of the immune response, perinatal health, and applying novel diagnostics and analytic methodologies to advance clinical care in resource-limited settings in India, Sub-Saharan Africa, and Latin America. I am currently the PI on a trial of vitamin D supplementation among patients with TB in South India and I am also leading parallel efforts to initiate active surveillance programs in 10 villages with a population of ~75,000 individuals in India and in coastal Ecuador. With Dr. Erickson, we have also invented the Cornell Nutriphone to enable point-of-care diagnosis of both nutritional status and certain infections using a smartphone.

I. The Role of Vitamin D in infectious disease, including HIV and Tuberculosis

My research has highlighted the potential role of vitamin D as a modifiable risk factor for slowing disease progression and disease severity both in the context of HIV and Tuberculosis. I published the first longitudinal studies demonstrating an association between vitamin D and HIV in sub-Saharan Africa. In recent work, I have also shown how vitamin D status is tied to the risk of relapse in patients with tuberculosis.

Building upon this work, I am currently the principal investigator on a trial of vitamin D supplementation in patients with tuberculosis and those with HIV co-infection (Clinicaltrials.gov NCT01992263). The major outcomes of interest, in addition to treatment response, include immune competence and effect on vitamin D status. In another study, I am collaborating with the National Institute of Nutrition in Hyderabad, India to examine the association of vitamin D with immune activation in hospitalized children. In Kenya, my research group is focusing on shedding more light on the relationship of vitamin D status with vaccine responses among infants.

II. Integrating Nutritional Approaches with Modern Technology

A. Biofortification: My interest also extends to examining sustainable means of modifying nutritional status such as biofortification to achieve higher concentrations of micronutrients in staple crops through non-GMO approaches. I am the principal investigator of a randomized controlled trial of biofortified pearl millet (high iron and zinc) designed to examine the effects of its consumption on growth and immune and cognitive function among 700 infants in India (Clinicaltrials.gov NCT02233764).

B. Novel Diagnostics: Along with David Erickson, I am the co-inventor of the Cornell Nutriphone, a smartphone platform for real-time quantitative determination of biomarkers of nutritional status. We now have a working prototype for measuring vitamin D status from a single drop of blood and have published a paper showing proof of concept with support from the Atkinson Center for a Sustainable Future. We have also used this technology to detect infections such as *Helicobacter pylori* and are planning to build upon this technology to detect other diseases.

While such devices can help with personalized monitoring of nutritional status in the resource-rich context, they can massively improve health services in poorer settings. Most primary health care centers, for example, in developing countries don't have access to conventional assays for nutritional status as they need sophisticated laboratory setups and trained personnel. Equipping such health care centers with a smartphone-based device, which can be easily interpreted by a health worker, can immediately upgrade the quality of service and access for the thousands of individuals served by each center.

III. Infectious Disease Epidemiology and Surveillance

I have a long-standing interest in identifying modifiable risk factors for preventing the acquisition, transmission, and progression of infections focusing on nutritional status, both through observational studies, and randomized controlled trials. My research group is helping setup active surveillance systems for nutritional status and infectious diseases such as Dengue and Tuberculosis in Ecuador and India to facilitate early detection and triage/referral of various

illnesses, interrupt transmission cycles, and characterize the background population for future intervention, efficacy, and effectiveness studies. The aims include expanding surveillance and epidemiology training and capacity in partner countries, and increase research in identifying nutritional and immunological risk factors for these diseases.

Extension

Education

Education

M.B.B.S. - All India Institute of Medical Sciences, New Delhi, India - 2003

M.S. (Epidemiology) - Harvard University, Cambridge MA - 2004

Sc.D. (Epidemiology and Nutrition) - Harvard University, Cambridge MA - 2009

Courses

Courses Taught

NS 3060 - Nutrition and Global Health

NS 6580 - Advanced Epidemiology: *Theory and Practice*

NS 6010 - Special Topics in Nutrition - Writing group for graduate students to work on data analysis and creating publishable manuscripts

Guest Lectures

NS 1220 - Nutrition and the Life Cycle

Session on *Health and Nutrition Disparities: A Global Perspective*

NS 6200 - Translational Research and Evidence-based Policy and Practice in Nutrition

Sessions on *International Harmonization of Evidence-based Policy and Practice: Difference and Similarities* and *Statistical Approaches to Synthesis of Data*

IARD 4020 - Agriculture in Developing Nations

Session on *Nutrition Challenges in India*

Websites

Related Websites

mehta.human.cornell.edu

Administration

Administrative Responsibilities

Member, DNS Curriculum Committee

Member, Field of Nutrition Seminar Committee

Member, Mann Library Working Group

Member, DNS Admissions Committee

Member, Globalization-on-Campus Committee, Office of VPIA

Member, Faculty Search Committee, Faculty search in Optimizing Immune Responses, Department of Microbiology and Immunology, College of Veterinary Medicine, Cornell University

Member, Faculty Search Committee, Faculty searches in Global and Public Health Nutrition; and Community Nutrition Interventions, DNS

Publications

Selected Publications

Peer-Reviewed Journal Articles

1. Sohal DPS, Garg N, Singh D, **Mehta S**, Anand K, Kapoor SK. Antibiotic prescription practice at primary and secondary level hospitals of a medical college. *Indian Practitioner* 2006;59(12):789-94.
2. **Mehta S**, Fawzi W. Effects of Vitamins, Including Vitamin A, on HIV/AIDS Patients. *Vitam Horm* 2007; 75: 355-383.
3. **Mehta S**, Ding EL, Fawzi WW, Giovannucci EL. Influence of Estrogen Therapy on Effects of Calcium and Vitamin D for Colorectal Cancer Prevention. *Int J Cancer* 2008;122:1690-4.
4. Wig N, Sakhuja A, Agarwal SK, Khakha DC, **Mehta S**, Vajpayee M. Multidimensional health status of HIV-infected outpatients at a tertiary care center in north India. *Indian J Med Sci* 2008;62:87-97.
5. **Mehta S**, Manji KP, Young AM, Brown ER, Chasela CC, Taha TE, Read JS, Goldenberg RL, Fawzi, WW. Nutritional indicators of adverse pregnancy outcomes and mother-to-child transmission of HIV among HIV-infected women. *Am J Clin Nutr* 2008;87:1639-49. PMID: PMC2474657
6. Shet A, **Mehta S**, Rajagopalan N, Dinakar C, Ramesh E, Samuel NM, Indumathi CK, Fawzi WW, Kurpad AV. Anemia and growth failure among HIV-infected children in India: a retrospective analysis. *BMC Pediatr* 2009;9:37. PMID: PMC2702283
7. **Mehta S**, Hunter DJ, Mugusi FM, Spiegelman D, Manji KP, Giovannucci EL, Hertzmark E, Msamanga GI, Fawzi WW. Perinatal Outcomes, Including Mother-to-Child Transmission of HIV, and Child Mortality, and Their Association with Maternal Vitamin D Status in Tanzania. *J Inf Dis* 2009;200:1022-1030. *Accompanied by an Editorial Commentary: Spector SA. Vitamin D Earns More Than a Passing Grade. J Inf Dis* 2009;200:1015-1017. PMID: PMC2758703

8. Mugusi FM, **Mehta S**, Villamor EV, Urassa W, Saathoff E, Bosch RJ, Fawzi WW. Factors associated with mortality in HIV-infected and uninfected patients with pulmonary tuberculosis. BMC Public Health 2009;9:409. PMCID: PMC2779816
9. Franke MF, Spiegelman D, Ezeamama A, Aboud S, Msamanga GI, **Mehta S**, Fawzi WW. Malaria Parasitemia and CD4 T-cell count, Viral Load, and Adverse HIV Outcomes among HIV-infected Pregnant Women in Tanzania. Am J Trop Med Hyg 2010;82:556-562. PMCID: PMC2844563
10. **Mehta S**, Giovannucci E, Mugusi FM, Spiegelman D, Aboud S, Hertzmark E, Msamanga GI, Hunter D, Fawzi WW. Vitamin D status of HIV-infected women and its association with HIV disease progression, anemia, and mortality. PLoS One 2010;5:e8770. PMCID: PMC2808247
11. **Mehta S**, Spiegelman D, Aboud S, Giovannucci EL, Msamanga GI, Hertzmark E, Mugusi FM, Hunter DJ, Fawzi WW. Lipid-soluble vitamins A, D, and E in HIV-infected pregnant women in Tanzania. Eur J Clin Nutr.2010;64:808-17. PMCID: PMC3078753
12. **Mehta S**, Fawzi WW. Editorial Commentary: Micronutrient Supplementation as Adjunct Treatment in HIV-infected Patients. Clin Inf Dis. 2010;50:1661-1663.
13. Liu E, Spiegelman D, Semu H, Hawkins C, Chalamilla G, Aveika A, Nyamsangia S, **Mehta S**, Mtasiwa D, Fawzi WW. Nutritional Status and Mortality Among HIV-infected Patients Receiving Antiretroviral Therapy in Tanzania. J Infect Dis 2011; 204:282-90.
14. Murray CJ, Lopez AD, Black R, Ahuja R, Mohd Ali S, Baqui A, Dandona L, Dantzer E, Das V, Dhingra U, Dutta A, Fawzi W, Flaxman AD, Gomez S, Hernandez B, Joshi R, Kalter H, Kumar A, Kumar V, Lozano R, Lucero M, **Mehta S**, Neal B, Ohno SL, Prasad R, Praveen D, Premji Z, Ramirez-Villalobos D, Remolador H, Riley I, Romero M, Said M, Sanvictores D, Sazawal S, Tallo V. Population Health Metrics Research Consortium Gold Standard Verbal Autopsy Validation Study: Design, Implementation and Development of Analysis Datasets. Popul Health Metr 2011;9:27. PMCID: PMC3160920
15. **Mehta S**, Mugusi FM, Spiegelman D, Villamor E, Finkelstein JL, Hertzmark E, Giovannucci EL, Msamanga GI, Fawzi WW. Vitamin D Status and its Association with Morbidity including Wasting and Opportunistic Illnesses in HIV-infected Women in Tanzania. AIDS Patient Care STDs 2011;25:579-585. PMCID: PMC3183700
16. **Mehta S**, Mugusi FM, Bosch RJ, Aboud S, Chatterjee A, Finkelstein JL, Fataki M, Kisenge R, Fawzi WW. A Randomized Trial of Multivitamin Supplementation in Children with Tuberculosis in Tanzania. Nutr J 2011;10:120. PMCID: PMC3229564
17. Finkelstein JL, **Mehta S**, Aboud S, Duggan CP, Kupka R, Spiegelman D, Msamanga GI, Fawzi WW. Predictors of Anemia and Iron Deficiency in HIV-infected Pregnant Women: A potential role for vitamin D and parasitic infections. Public Health Nutr 2012;15:928-937. PMCID: PMC3366262

18. Shet A, Arumugam K, Rajagopalan N, Dinakar C, Krishnamurthy S, **Mehta S**, Shet AS. The prevalence and etiology of anemia among HIV-infected children in India. *Eur J Pediatr*. 2012;171:531-540. PMID: 22009132
19. Finkelstein JL, **Mehta S**, Duggan CP, Manji KP, Spiegelman D, Msamanga GI, Fawzi WW. Maternal Vitamin D Status and Child Morbidity, Anemia, and Growth in Human Immunodeficiency Virus-exposed Children in Tanzania. *Pediatr Infect Dis J* 2012;31:171-175. PMCID: PMC3813463
20. Finkelstein JL, Manji KP, Duggan C, Hertzmark E, **Mehta S**, Msamanga GI, Spiegelman D, Fawzi WW. Predictors of incident tuberculosis in HIV-exposed children in Tanzania. *East Afr Med J* 2012;89:183-192.
21. Hawkins C, Christian B, Ye J, Nagu T, Aris E, Chalamilla G, Spiegelman D, Mugusi F, **Mehta S**, Fawzi W. Prevalence of Hepatitis B co-infection and response to antiretroviral therapy among HIV-infected patients in urban Tanzania. *AIDS* 2013;27:919-27. PMID: 23196935
22. Fataki M, Kisenge RR, Sudfeld CR, Aboud S, Okuma J, **Mehta S**, Spiegelman D, Fawzi WW. Effect of Zinc Supplementation on Duration of Hospitalization in Tanzanian Children Presenting with Acute Pneumonia. *J Trop Pediatr* 2014;60:104-11. PMCID: PMC3967446
23. **Mehta S**, Mugusi FM, Bosch RJ, Aboud S, Urassa W, Villamor E, Fawzi WW. Vitamin D status and TB treatment outcomes in adult patients in Tanzania. *BMJ Open* 2013;3:e003703. PMCID: PMC3840339
24. Murray CJ, Lozano R, Flaxman AD, Serina P, Phillips D, Stewart A, James SL, Vahdatpour A, Atkinson C, Freeman MK, Ohno SL, Black R, Ali SM, Baqui AH, Dandona L, Dantzer E, Darmstadt GL, Das V, Dhingra U, Dutta A, Fawzi W, Gómez S, Hernández B, Joshi R, Kalter HD, Kumar A, Kumar V, Lucero M, **Mehta S**, Neal B, Praveen D, Premji Z, Ramírez-Villalobos D, Remolador H, Riley I, Romero M, Said M, Sanvictores D, Sazawal S, Tallo V, Lopez AD. Using Verbal Autopsy to Measure Causes of Death: The Comparative Performance of Existing Methods. *BMC Med* 2014;12:5. PMCID: PMC3891983
25. Ahmed S, Finkelstein JL, Stewart AM, Kenneth J, Polhemus ME, Endy TP, **Mehta S**. Micronutrients and Dengue: A Review of the Current Evidence. *Am J Trop Med Hyg* 2014;91(5):1049-56. PMCID: PMC4228873
26. Lee S, Oncescu V, Mancuso M, **Mehta S**, Erickson D. A smartphone platform for the quantification of vitamin D levels. *Lab Chip* 2014;14:1437-42. PMID: 24569647
27. Erickson D, O'Dell D, Jiang L, Oncescu V, Mancuso M, **Mehta S**. Smartphones will be transformative for the deployment of lab-on-a-chip devices. *Lab Chip* 2014;14:3159-64. PMCID: PMC4117816
28. Natamba BK, Achan J, Arbach A, Oyok TO, Ghosh S, **Mehta S**, Stoltzfus RJ, et al. Reliability and validity of the center for epidemiologic studies-depression scale in screening for depression among HIV-infected and -uninfected pregnant women

attending antenatal services in northern Uganda: a cross-sectional study. BMC Psychiatry. 2014 Nov 22;14(1):303. PMCID: PMC4260190

29. Finkelstein JL, Gala P, Rochford R, Glesby MJ, **Mehta S**. HIV/AIDS and Lipodystrophy: Implications for clinical management in resource-limited settings. J Int AIDS Soc 2015 Jan 15;18(1):19033. PMID: 25598476.

Invited Book

1. **Mehta S**, Finkelstein JL, eds. Nutrition and HIV: From Epidemiological Evidence to Public Health. CRC Press. *In preparation*.

Book Chapters and Technical Papers

1. **Mehta S**, Finkelstein JL, Fawzi WW. Nutritional Interventions in HIV-Infected Breastfeeding Women. Ann Nestlé [Engl] 2007; 65: 39–48.

2. **Mehta S**, Fawzi WW. Hunger and HIV and Tuberculosis. Technical paper for the World Hunger Series 2007. World Food Programme, Rome, Italy.

3. **Mehta S**, Finkelstein JL, Fawzi WW. Micronutrient status and pregnancy outcomes in HIV-infected women. Editors: Lammi-Keefe CJ, Couch SC, Philipson, E. Humana Press: Baton Rouge, LA. Handbook of Nutrition and Pregnancy 2008; 23: 355-365.

4. Finkelstein JL, Mugusi FM, **Mehta S**, Fawzi WW. HIV/AIDS and Nutrition in the HAART Era: Programmatic implications for HIV/AIDS care and treatment in resource-limited settings. Editors: Marlink RG, Teitelman SJ. Elizabeth Glaser Pediatric AIDS Foundation: Washington, DC. From the Ground Up: Building Comprehensive HIV/AIDS Care in Resource-Limited Settings 2009.

5. Yu EA, Finkelstein JL, **Mehta S**. HIV and Micronutrients. Editors: Pammi M, Vallejo JG, Abrams SA. Taylor and Francis Books, Inc.: Boca Raton, FL. Nutrition-Infection Interactions and Impacts on Human Health 2014.

Letters to the Editor

1. **Mehta S**, Fawzi WW. Letter to the Editor in response to comments on: Mehta S, et al. Perinatal Outcomes, Including Mother-to-Child Transmission of HIV, and Child Mortality, and Their Association with Maternal Vitamin D Status in Tanzania. J Inf Dis. 2010;201:1951.

2. Finkelstein JL, **Mehta S**, Fawzi WW. Letter to the Editor in response to comments on: Finkelstein JL, et al. Predictors of Anemia and Iron Deficiency in HIV-infected Pregnant Women: A potential role for vitamin D and parasitic infections. Public Health Nutr 2012;20:1. [Epub ahead of print].