



JOHNS HOPKINS

GUPTA-KLINSKY
INDIA INSTITUTE



JHU-INDIA FACULTY-LED PROJECTS

November 2024

This compendium provides an overview of faculty-led projects undertaken by Johns Hopkins University (JHU) in India, spanning fields such as infectious disease research, maternal and child health, digital health innovations, environmental resilience, and social development. These projects aim to address critical public health and development challenges through collaborative, evidence-based approaches that leverage the expertise of JHU faculty, students, and their Indian counterparts.

This compendium is intended as a resource for stakeholders who seek to understand the scope, objectives, and outcomes of JHU's work in India, showcasing the university's commitment to knowledge sharing and sustainable impact.

We extend our sincere gratitude to all faculty members and project teams who have contributed to this compendium, providing valuable details and insights into their ongoing work.

JHU faculty members who wish to have additional projects included in future editions are encouraged to reach out. Please contact us at jhii@jh.edu, and we will be pleased to incorporate relevant updates.



Public Health

HEALTH SYSTEMS

Uttar Pradesh Health System Strengthening Support

With a population of over 220 million, Uttar Pradesh (UP), India's most populous state, accounts for approximately one sixth of India's population. Maternal, neonatal, infant and child mortality rates are substantially higher in UP than in the rest of India. To address these, Bill and Melinda Gates Foundation has been funding technical assistance (TA) to the Government of UP (GOUP) since 2013 through the establishment of Uttar Pradesh Technical Support Unit (UPTSU).

Uttar Pradesh Health Systems Strengthening Project (UPHSSP) is a component of integrated TA led by BSPH, that collaborates with UPTSU to build system-wide capacity of GOUP in the health sector.

The UPHSSP project utilizes the following approach to build system-wide capacity of GOUP's health sector:

1. **Strengthening institutional capacity:** The primary aim of this approach is to ensure sustained institutional capacity of state health institutions, namely, Directorate of Medical Health (DOMH), State Institute of Health and Family Welfare (SIHFW), and AIIMS Gorakhpur.
2. **Strengthening public health training:** The primary aim of this approach is to ensure public health professionals working across the state are equipped with high-quality public health management and leadership skills through design of core competencies, enhanced training, and leadership development.
3. **Strengthening human resources for health (HRH) research and analytics:** The primary aim of this approach is to ensure the state's effort to make evidence-informed HRH policies and practices is supported through research and related analytics.
4. **Strengthening data use for decision-making:** The primary aim of this approach is to enhance state's capacity to use data for decision-making by generating evidence around existing capacity and barriers to data use.

Principal Investigator(s): Cyrus Y. Engineer, DrPH

Other faculty member(s) involved: Sara Bennett (PhD), Smisha Agarwal (PhD)

Duration: December 2017 – May 2025

Location(s): Uttar Pradesh

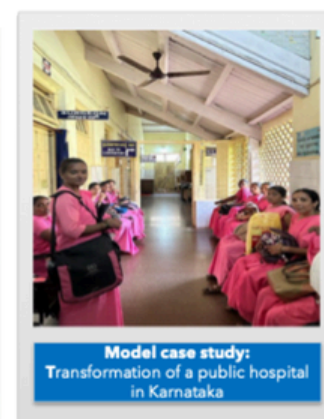
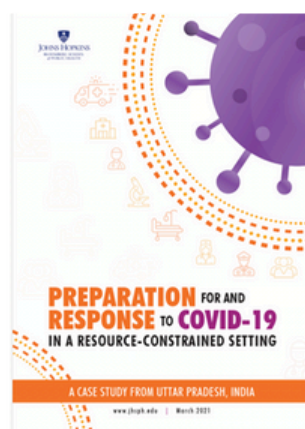
Funding Sources: Bill & Melinda Gates Foundation

Partners: The State Institute of Health and Family Welfare (SIHFW), Lucknow; Indian Institute of Management (IIM), Lucknow; All India Institute for Medical Sciences (AIIMS), Gorakhpur; Indian Institute of Public Health, Gandhinagar, Gujarat

- BSPH has provided comprehensive support to the DOMH, including organizational culture and process assessments, recommendations to strengthen core and support functions, and a proposed senior leadership structure.
- The project catalyzed a partnership between the Department of Medical Health and Family Welfare (Government of Uttar Pradesh), JHU and AIIMS Gorakhpur called "SEWARTH" to organize first-of-its-kind training programs in problem solving for public health officers and AIIMS faculty.

- The project has collaborated with IIM Lucknow and SIHFW to design and conduct public health management and L4 leadership trainings for mid-level health officers of GOUP. This will build leadership and management competencies among the participants who can lead long-term change within the government.
- UPHSSP's efforts have also strengthened SIHFW's ability to conduct select trainings through training-of-trainer support and the identification of local partners/domain experts.
- UPHSSP has contributed to the sustainability of AIIMS Gorakhpur's capacity to influence public health policies and programs in the state by strengthening its research and training capabilities.

Other notable initiatives through UPHSSP

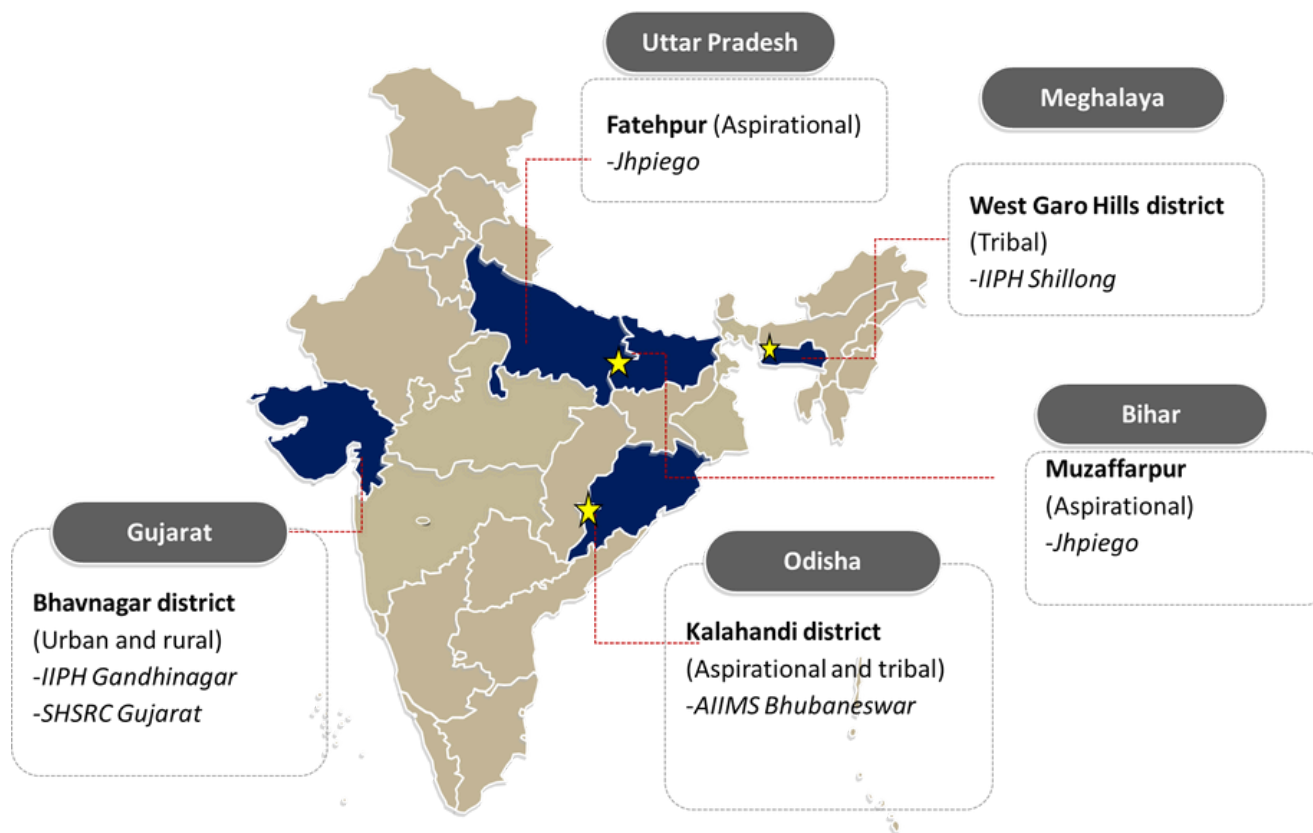


India Primary Healthcare Support Initiative (IPSI)

India's primary healthcare system faces several challenges, particularly in delivering standardized, comprehensive care at the district level. Strengthening primary healthcare is critical to improving access to quality services, addressing disparities, and achieving better health outcomes across underserved regions. IPSI, led by BSPH, partners with institutions like AIIMS, IIPH, NHRSC, and Jhpiego to support the Government of India's efforts to deliver Comprehensive Primary Health Care (CPHC). IPSI focuses on three pillars:

- **Measure:** Develop and deploy a state and district-level performance measurement index for assessing primary health care system's performance
- **Demonstrate:** Provide design, implementation and capacity building support to the select states and one district from each state for improving primary health care system performance
- **Recognize:** Identify and scale effective models of healthcare delivery

Principal Investigator(s): Krishna D Rao
Other faculty member(s) involved: Sara Bennett, Svea Closser, Akriti Mehta
Duration: June 2022 – August 2026
Location(s): Gujarat, Odisha, Meghalaya, Uttar Pradesh, Bihar
Funding Sources: Bill & Melinda Gates Foundation
Partners: AIIMS New Delhi; AIIMS Bhubaneshwar; IIPH Gandhinagar; IIPH Shillong; Jhpiego India



IPSI addresses critical gaps in India’s primary healthcare system by developing a comprehensive performance framework and index, enabling policymakers and program managers to access standardized data on healthcare delivery at the district level. IPSI’s technical support to Ayushman Bharat’s Health and Wellness Centers (HWCs) enhances service readiness, quality care, and community-based services in key states. Through its collaborative approach, IPSI fosters cross-learning across states, creating scalable models of high-performing HWCs that can be replicated nationwide. This initiative strengthens the ties between educational institutions and government agencies, ensuring long-term improvements in primary healthcare delivery across India.

NISHTHA – Transforming Comprehensive Primary Healthcare in India (CPHC)

NISHTHA is transforming comprehensive and client-centered primary health care (PHC) across 12 states of India (including Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim), working closely with national and state governments and engaging with private sector partners to mend the fragmented patient journey and introduce

Duration: 2021 to present

Locations: Maharashtra, Arunachal Pradesh, Assam, Chhattisgrah, Jharkhand, Karnataka, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Rajasthan, Sikkim, Tripura

Funding Sources: USAID

comprehensive PHC services nationwide. This project focuses on equitable, comprehensive, and client-centered services to improve health outcomes for marginalized and vulnerable populations, especially women and girls. NISHTHA aims to develop a robust, accessible, and affordable PHC system, delivering effective RMNCH and adolescent health services, and integrating tuberculosis control alongside managing public health challenges like COVID-19.

Goal is to support the GoI to create a comprehensive PHC system that provides equitable services to all, with an emphasis on women and girls.

Objective 1: Support the national and state governments in their efforts to implement the GoI's vision of a CPHC system through effective and responsive technical assistance

- Support for Adapting the design and framework of the national plan for CPHC to address local context and priorities through a state-level co-design workshop
- Provide technical assistance for operationalization of HWCs and planning for CPHC at the state and national levels.
- Build capacity of state and district officials for CPHC
- Operationalization and task optimization of CPHC providers Operationalization and task optimization of CPHC (CHOs, Auxiliary Nurse Midwives and ASHAs)
- Forge meaningful exchange between efforts for implementation at scale and the learning labs created by the project
- Intentional cross fertilization of CPHC
- Setting up of a Rapid Response Team (RRT)
- Provide technical assistance for roll out of Adolescent Health Program at national and state level

Objective 2: Establish an ecosystem for innovations and a strong learning agenda for designing, incubating and testing innovative solutions to address some of key intractable barriers that impede the delivery of CPHC in India and use the learnings generated to inform the overall design of CPHC by the GoI

- Establish a series of learning labs
- Community engagement for client-centered care
- Document and gather evidence in learning labs
- Accelerate implementation of solutions to improve delivery efficiency and address client access to PHC

Objective 3: Facilitate strategic partnerships between public and private sectors through establishment of platforms, alliances and advisory group for CPHC in India

- Establish a program advisory group
- Foster alliances between governments and private sector
- Encourage enterprise-driven solutions
- Establish platforms for dialogue
- Capture learnings from private sector engagement

RISE - Global Health Security

RISE, funded by USAID and implemented by Jhpiego, is a global project operating in 46 countries to achieve epidemic control through sustainable health systems. Launched in India in 2020 to respond to COVID-19, RISE provided technical assistance to 28 states in areas of critical care services, laboratory capacity, vaccine coverage, oxygen ecosystem management, infection prevention & control including biomedical waste management leveraging its network of 2000+ healthcare facilities, 12 NGS labs network, 5 critical care simulation labs, digital case based learning platform (DiShA), and standardized learning resources and partnership with state and national government institutions.

Recognizing the evolving nature of public health threats, particularly AMR and zoonotic diseases, RISE has gradually transitioned from pandemic response to building resilient health systems for combatting future public health emergencies. By leveraging its presence and assets developed during the earlier phase, RISE is working towards enhancing capacity to prevent, detect, and respond to public health emergencies to achieve Global Health Security in collaboration with National centre for disease control (NCDC) and Department of Animal Husbandry and Dairying (DAHD). This approach aims to build a more resilient and secure future for public health in 8 states.

Key domains:

- National Laboratory Systems: Strengthen cross-sectoral laboratory capacities to optimize disease detection and reporting capabilities for AMR, zoonoses and climate related threats.
- Assessment of Regional Disease Diagnostic Labs and Central Disease Diagnostic Labs for Quality Management System (QMS)
- Implementation of QMS in CDDL and RDDDL
- Implementation of External Quality Assessment in reference labs (Regional Coordinator & Sentinel Surveillance Site)
- Training of lab personnel on Good
- Laboratory Practices (GLP) and QMS
- Repurposing of molecular testing and Next Generation sequencing (NGS) laboratories using hub and spoke model.
- Demonstrate metagenomic Next generation sequencing as a technique for zoonoses and AMR surveillance in 2 facilities.
- Anti-microbial Resistance: Promote antimicrobial stewardship and a one-health approach across human and animal health sectors to combat antimicrobial resistance and address zoonotic diseases.
- National-level stakeholder engagement workshop
- State-level SAP-CAR/Operational plan development
- Development of Learning Resources & Capacity building for AMR detection and AMS
- Operationalization support to selected facilities for judicious antimicrobial use
- IPC training at the state level
- Demonstrate the use of NGS for AMR detection
- RCCE strategy development

- Zoonoses and Animal Health: Enhance the capacity for detection, monitoring, and response to zoonotic diseases through the promotion of a one-health approach across human and animal health sectors
Intersectoral Coordination Meetings
- Development of Learning Resources
- RCCE strategy development
- Create a knowledge network for animal health
- Defining diagnostic framework for animal health
- Guidelines for implementation of Early Warning and Risk-based surveillance
- Development of inter-country sample transportation guidelines
- Training of healthcare workers and lab personnel
- STG development for select zoonotic diseases

MCGL - Youth Population, FP (Yash)

USAID India, with the MOMENTUM Country and Global Leadership (MCGL) field support mechanism, is implementing a program focused on Family Planning (FP) and Reproductive Health (RH) for young populations (YPs) that will contribute to the achievement of national FP goals and is aligned with USAID India's Country Development Cooperation Strategies (CDCS) goal of improving the health and resilience of India's marginalized populations. The project aims to improve young people's family planning and reproductive health outcomes by adapting innovative, high-impact models from previous programs. It will create scalable approaches for youth to manage their sexual and reproductive health needs, aligning with USAID's goal of fostering sustainable development in India through local capacity-building, inclusive development, and strong government partnerships.

Principal Investigator: Jhpiego

Duration: Currently Active

Location: Assam, Gujarat, Tamil Nadu, Delhi

Funding Sources: USAID

MCGL India-Yash interventions:

- **Youth-led Movement:** The intervention aims to build a multi-state Family Planning and Sexual and Reproductive Health and Rights youth-led movement through surfacing new and non-traditional voices, building unconventional partnerships, and creating a new narrative for FP/RH linked to life choices and economic aspirations.
- **Udaan Collaborative:** The intervention is focused on building the largest network of stakeholders, including obstetrics and gynecologists, general physicians, and pharmacists in the private sector, to increase the usage of family planning products and services by young people.
- **Yash Entrepreneurs Program:** The intervention identifies and supports medium and late-stage enterprises to scale family planning and reproductive health innovations.
- **Enhancing the Value of Girl Child - through social action initiatives in colleges and vocational institutes:** This intervention aims to address regressive gender norms and support the rights of women and girls by engaging colleges and vocational institutions through collaboration and partnership.

- **Special Cell and Community Approach (SCCA):** The intervention is working towards combating GBV by focusing on prevention, strengthening state response, and increasing SRH knowledge amongst young GBV survivors in Assam.
- **Protecting the rights of girls in India in the COVID era by preventing CEFM (Child, Early, and Forced Marriage):** The intervention promotes delaying the age of marriage of adolescent girls by creating an enabling and empowering ecosystem and preventing early forced marriage by connecting them to social protection schemes including livelihood opportunities.
- **Technical Assistance to Govt. of India - Ayushman Bharat School Health and Wellness Programme:** A flagship program by the Govt. of India to increase awareness of health issues, including sexual and reproductive health (SRH) among school-going adolescents. MCGI India-Yash is currently providing technical assistance to the government in 10 states to ensure the smooth implementation of the program within government schools.
- **Contraceptive Security:** Elevating the Govt. Of India's supply chain, our initiative integrates advanced Family Planning Logistics Management Information Systems (FPLMIS) tools for resilient last-mile delivery of contraceptives.
- **Delhi Learning Lab:** A comprehensive demonstration site developed to implement learnings from across all interventions of MCGI India-Yash.
- **Expansion of Contraceptive Choices:** The intervention aims to facilitate access to an expanded basket of contraceptive options by introducing newer contraceptive methods – contraceptive implants and DMPA Subcutaneous and increasing awareness and knowledge in the community regarding the need for family planning. MCGI India-Yash is providing technical support to the states of Gujarat and Tamil Nadu to ensure the provision of quality and voluntary family planning services and strengthen facilities and districts through clinical and programmatic support.

PRERANA-Fire Up

“PRERANA - Promoting Equity and Reproductive Health Access for Northeast India,” funded by USAID for five years, focuses on enhancing Sexual & Reproductive Health (SRH) services in India's eight North Eastern States. It aims to strengthen the health system through innovative solutions that support local government, the private sector, and civil society. Led by Jhpiego with five consortium partners, the project aligns with India's FP 2030 goals by co-designing strategies and evidence-based solutions for youth in FP/RH. Its main objective is to create a responsive health system, delivering equitable, comprehensive, and client-centered services with community participation. PRERANA targets improved health outcomes for vulnerable groups like Gender-Based Violence survivors, People Living with HIV/AIDS, and more. Goal- Creating a responsive health ecosystem by ensuring the availability of quality SRH services for addressing adolescents and young people's reproductive health choices in Northeast India.

Principal Investigator: Jhpiego

Duration: Currently Active

Location: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura

Funding Sources: USAID

Key Objectives:

- Harness innovative models in northeast India to increase the equitable delivery of quality, adolescent, and gender-responsive FP/RH and GBV services in the public and private sectors, focusing on reaching youth, vulnerable, and marginalized populations.
- Foster vibrant, engaged, supportive, and resilient communities through local civil society organizations and structures that empower youth, women, vulnerable and marginalized populations and effectively engage men and local leaders to shift community norms and attitudes, leading to increased demand and voluntary use of FP/RH services and reductions in early marriage and pregnancy.
- Create responsive and responsible markets via public-private partnerships (PPPs), catalytic investments, and resource mobilization to improve access and quality of FP/RH services for youth, vulnerable and marginalized populations.

India's Aspirational District Program: Unpacking Public Health Guidance to Strengthen Government Health Systems

Currently, a hot topic within global public health, one touted at international conferences and hailed as the next step by many scholars, is “multisectoral convergence.” The key idea behind multisectoral convergence as a goal is that improving population health will require much more than single disease initiatives targeting specific pathogens. It will require cross-cutting action across multiple sectors. The call for multisectoral collaboration is particularly interesting because it is aimed not at recipient populations, but at states. There is a clear need to understand such complex public health policy processes, including the dynamics between donors, governments, and international agencies. Yet we have very little evidence in the medical anthropological literature about what happens when governments engage in the ambitious goal of working across sectors to comprehensively address poor health. We plan to conduct an ethnography of India's Aspirational District program, a national program launched in 2018 to improve the health, wellbeing, and productivity of people in the most disadvantaged 112 districts of the country. We will conduct a multi-sited ethnography of the program, “following the policy” from the national level in Delhi, to the state level in Karnataka, to the Aspirational District of Raichur. Our research goals are: (1) To build a robust theoretical understanding of the complex policy processes involved in framing public health guidance for broad based multisectoral approaches for health; (2) To gain a nuanced understanding of how public health guidance aimed at the state itself gets adapted, interpreted, translated (literally and figuratively) and transformed by various stakeholders as it moves from national to state to sub-district levels; (3) To elucidate what the quantitative datasets used to monitor and evaluate the Aspirational District program reveal about the program's impact on health inequality, as well as what program dynamics that data may obfuscate, hide, or miss entirely; and (4) To understand how the “Aspirational”

Principal Investigator: Svea Closser (JHU faculty), Devaki Nambiar (JHU alum, based at The George Institute in Delhi)

Other faculty members involved:

Shalini Singh, Emily Miller

Duration: June 2024 - May 2027

Location: Delhi, Bangalore, Raichur

Funding Sources: National Science Foundation (US)

vision to leverage strengths and greater ownership of district governments is understood and implemented by local stakeholders, and how the program is perceived by the people living in Aspirational Districts—the people the program aims to benefit.

The project aims to illustrate the value of ethnographic insight to the next generation of potential ethnographers, with a focus on underrepresented students. This project will include training in ethnography for four groups of students: (1) high school students in the Baltimore City Public Schools; (2) field research in India for students at Johns Hopkins University; (3) research experience in ethnography for an Indian public health student working with The George Institute of Global Health in Delhi; and (4) a series of seminars in the ethnography of policy, held at Indian training institutes. We will also communicate the results of this research to policymakers in India, and work with them to draw on the findings of this work in creating public health guidance for their new Aspirational Block Programme. We will communicate our results to the public through press articles and podcasts in both English and Hindi.

Arogya Sangama – 3 Way Partnership of People, Providers and Panchayat

The Arogya Sangama project seeks to build on the success of cross-sector collaboration during COVID-19 in Karnataka, particularly through the Gram Panchayat Task Forces (GPTFs). These task forces brought together local leaders, health providers, and stakeholders, demonstrating the potential for effective community-led health governance. Arogya Sangama aims to enhance GPTF capacities to function as a collaborative platform for community ownership, grassroots convergence, and governance of rural Health and Wellness Centers (HWCs) in Karnataka.

Principal Investigator: Svea Closser

Other faculty members involved:

Shalini Singh, Emily Miller

Duration: January 2023-2025

Location: Raichur and Chamrajnagar, Karnataka

Funding Sources: Government of Karnataka, Department of Rural Development and Panchayat Raj

Partner: Karnataka Health Promotion Trust

By designing an intervention in collaboration with local communities in two districts, the project will explore how GPTFs can improve the performance of primary health systems in areas such as service utilization, community engagement, and quality of care. Using a human-centered design approach, the project will prototype solutions and assess their impact through a mixed-methods quasi-experimental study, ultimately providing the Government of Karnataka with an operational plan for potential scale-up across other rural areas.

NON COMMUNICABLE DISEASES

Breast Cancer Risk Prediction Tool for Indian Population

This proposal aims to build the first-ever breast cancer risk-prediction tool for the Indian population by capitalizing on a decade-long collaboration between the co-PI Dr. Nilanjan Chatterjee and epidemiologists at the Tata Memorial Cancer (TMC) Hospital, Mumbai, and expertise in implementation and dissemination of digital health tools by faculties at the Koita Center for Digital Health, IIT Mumbai. We will use data available from a large case-control study conducted at the TMC to

estimate risk parameters associated with well-established risk factors and then use the innovative risk prediction software tool Individualized Coherent Absolute Risk Estimator (iCARE) to develop an absolute risk model integrating information on population incidence rates and risk-factor distributions. Based on this statistical model, we will develop a progressive web portal and accompanying mobile app for the calculation of the risk of individual women based on input from them on their risk-factor profiles. The project has a long-term scope as successful development of the model and associated clinical risk-calculation tools will generate additional research and implementation projects, including studies for model validation, incorporation of biomarkers such as polygenic risk-scores, improvement of the models through AI technology, and conducting of qualitative studies through a survey of physicians and the general public regarding the ease and usefulness of the tool. Ultimately, we expect to develop the most established and validated breast cancer risk prediction tool for the diverse Indian population and thus bring the opportunity for personalized breast cancer prevention to the country through the integration of the digital tool into large healthcare delivery organizations.

Principal Investigator: Nilanjan Chatterjee

Other faculty members involved: Kala Visvanathan

Duration: October 2024-2026

Location: Mumbai

Funding Sources: GKII at JHU

Partners: Tata Memorial Cancer Hospital, Indian Institute of Technology (Mumbai)

The project has a long-term scope as successful development of the model and associated clinical risk-calculation tools will generate additional research and implementation projects, including studies for model validation, incorporation of biomarkers such as polygenic risk-scores, improvement of the models through AI technology, and conducting of qualitative studies through a survey of physicians and the general public regarding the ease and usefulness of the tool. Ultimately, we expect to develop the most established and validated breast cancer risk prediction tool for the diverse Indian population and thus bring the opportunity for personalized breast cancer prevention to the country through the integration of the digital tool into large healthcare delivery organizations.

Studies of genetic associations and gene-environment interactions of common cancers in the Indian context

Cancer incidence are steadily rising in India with its growing economy and adaptation of more western life-styles. Further, some cancers, such as gallbladder cancer and oral cancer of buccal mucosa, are uniquely common due to certain environmental exposures. The Center for Cancer Epidemiology (CCE) of the Tata Memorial Cancer (TMC), Mumbai, have launched large scale

case-control genome-wide association studies of multiple cancers, including that of gall bladder, buccal mucosa, breast and lung. These studies provide unique opportunity to discover genetic susceptibility loci and characterize gene-environment interactions in the Indian context. I and my trainee have been collaborating with the CCE-TMC over more than a decade now and we have regularly supervised the techniques required for advanced data analysis for these studies. This collaboration has led to the discovery of the first ever genetic susceptibility locus for gallbladder cancer (Lancet Oncology, 2018), identification of several life-style related risk factors for gallbladder cancer (International Journal of Cancer, 2020; International Journal of Epidemiology, 2022), replication of risk loci of breast cancer in the Indian population (Scientific Report, 2017), and discovery of new oral cancer loci (ongoing study). This is an ongoing effort which I expect to continue over long time.

Research Publications: Mahatre et al., Lancet Oncology (2018); Mhatre et al., International Journal of Epidemiology (2022); Mhatre et al., International Journal of Cancer (2020); Nagrani et al., Scientific Report (2017)

Principal Investigator: Rajesh Dikshit, Sarayu Mhatre at Tata Memorial

Duration: June 2014 - 2030

Location: Mumbai

Partners: Tata Memorial Cancer Hospital, Indian Institute of Technology (Mumbai)

This long-term collaboration in genetic epidemiologic studies of cancer has led to the development of the GKII-funded project for the development of breast cancer risk prediction tool for the Indian population. Identification of genetic and environmental risk-factors, and characterization of their interactions, will lead to understanding the etiologic mechanisms of cancers in the Indian context, and this emerging knowledge could ultimately transform cancer prevention effort in India through development of more risk-based intervention efforts.

APEX-Johns Hopkins Kidney Collaboration

The collaboration between Apex Kidney Foundation (AKF) and Johns Hopkins is a comprehensive partnership aimed at enhancing kidney disease care and research in India. AKF, a non-profit organization in Mumbai, is dedicated to raising awareness and providing subsidized care to economically disadvantaged kidney

Principal Investigator: Chirag R. Parikh

Duration: December 2022 - September 2027

Location: Mumbai

Donor: APEX Kidney Foundation

Partner: APEX Kidney Foundation

patients. Together, AKF and Johns Hopkins aim to conduct joint research on chronic kidney disease, combining local insights with global expertise to develop region-specific interventions. The partnership also focuses on educational programs, such as the Apex Nephrology Board Review Course, which brings in world-renowned faculty, including those from Johns Hopkins, to train healthcare professionals in advanced nephrology practices. Additionally, the collaboration involves community outreach initiatives to promote kidney health and early disease detection. By sharing resources and knowledge, the partnership builds local capacity for cutting-edge nephrology care, significantly impacting kidney health outcomes in India and beyond.

As a result of the partnership, there have been opportunities for global health research, educational talks regarding chronic kidney disease in India, and increased training opportunities for trainees in India and at Johns Hopkins.

IIT Bombay-Johns Hopkins Kidney Collaboration

The collaboration between Johns Hopkins and IIT Bombay aims to significantly enhance kidney disease research by leveraging the strengths of both institutions. Through this partnership, there is a strong emphasis on fostering innovative research, facilitating student and faculty exchanges, and creating advanced training programs. The collaboration opens opportunities to apply cutting-edge artificial intelligence and machine learning techniques to analyze complex kidney disease data, potentially leading to novel insights and improved clinical practices. This collaboration not only has the potential to revolutionize kidney disease research and care at Johns Hopkins and in India but also sets the foundation for a global research network that integrates technology and clinical expertise, ultimately improving patient outcomes and expanding the knowledge base in nephrology.

Principal Investigator: Chirag R. Parikh

Duration: December 2023 - September 2026

Location: Mumbai

Donor: IIT Mumbai

Partner: IIT Mumbai

This collaboration not only has the potential to revolutionize kidney disease research and care at Johns Hopkins and in India but also sets the foundation for a global research network that integrates technology and clinical expertise, ultimately improving patient outcomes and expanding the knowledge base in nephrology.

MATERNAL AND CHILD HEALTH

Assessing and Revitalizing Immunization through Social Engagement (ARISE)

Evidence from the previous epidemics have demonstrated that temporary disruptions of routine immunization services could lead to outbreaks of vaccine-preventable diseases, amplifying morbidity and mortality. The COVID-19 pandemic has led to major disruptions in

routine immunization services in India with a substantial decrease in routine immunization services in March 2020, at least 100,000 and 200,000 children missed their BCG and pentavalent vaccine doses, respectively. Reported causes of the interrupted immunizations are diverse, ranging from fear within the community, movement restrictions and, changing priorities in healthcare. A vast majority of frontline health workers have been reassigned to COVID-19 related activities, creating a void at the community level.

The team at Johns Hopkins Maternal and Child Health Center India works with Bal Umang Drishya Sanstha (BUDS), a non-profit organization in India, to enhance the uptake of routine immunization among pregnant women and children under 2 years of age. Located in 2 blocks of Mewat, Haryana, the project draws on Socio-Ecological Model to mobilize community for spreading awareness about the significance of routine immunization.

BUDS has established two Vaccination Knowledge Hubs that would act as centers for knowledge sharing and training for the frontline health workers and peer leaders to become child rights advocates regarding routine immunization. The monitoring and evaluation component will capture the effect of community mobilization and vaccination knowledge hub on the uptake of vaccination among pregnant women and children.

Principal Investigator(s): Aastha Kant

Location(s): Haryana

Partners: Bal Umang Drishya Sanstha (BUDS), India

Evaluation of leDA for improving Integrated Management of Neonatal and Childhood Illness (IMNCI) uptake and quality of care at primary healthcare facilities for scale-up in Jharkhand, India

India faces significant challenges in reducing childhood mortality, with high rates of neonatal and under-five deaths primarily due to preventable conditions such as infections, pneumonia, and undernutrition. Indian healthcare workers (HCWs) are overwhelmed by the complexity of cases and lack access to timely diagnostic and treatment guidelines, which can lead to suboptimal care for children.

Principal Investigator(s): Dr Smisha Agarwal

Other faculty member(s) involved: Dr Suruchi Gupta, Dr Diwakar Mohan

Duration:

Location(s): Jharkhand

Funding Sources: DIV, USAID

Partners: IIMR Jaipur

The introduction of digital health solutions, such as mobile-based clinical decision support systems (CDSS), has the potential to empower HCWs by providing them with real-time access to guidelines and protocols, thereby improving the quality of care for children. Proposed NCE Activities and Impact:

- **Level 4 (L4) Leadership and Management Training:** BSPH will continue supporting the implementation of L4 training, designed to enhance the leadership and management skills of mid-level medical officers. This training, which has been piloted with 53 medical officers, prepares participants for leadership roles and addresses public health challenges. Collaborating with the State Institute of Health and Family Welfare (SIHFW) and the Indian Institute of Management (IIM) Lucknow, BSPH will refine the program and integrate modules on gender and digital health. This initiative strengthens SIHFW's ability to deliver leadership training in the future.
- **Medical Officer Foundation Training (MOFT):** To tackle ongoing challenges in training medical officers, BSPH partnered with the Indian Institute of Public Health (IIPH) Gandhinagar to design a blended online and in-person model for MOFT. BSPH plans to finalize the curriculum and pilot the new model, while also addressing the backlog of officers requiring training. This new MOFT model will incorporate public health, leadership, and management competencies, positioning SIHFW to independently manage and deliver future trainings.
- **Support for AIIMS Gorakhpur:** BSPH will continue to strengthen the institutional capacity of AIIMS Gorakhpur by conducting training programs, including an evidence-to-policy-to-practice course for faculty members. BSPH will also support the development of a Health and Demographic Surveillance System (HDSS) to provide research-based evidence for health policies in Uttar Pradesh. Additionally, AIIMS Gorakhpur will lead public health trainings for state medical officers, aligning its efforts with state health priorities.

Integrating maternal, fetal, newborn, or infant safety in antenatal and post-natal care services for rural and tribal women in India

Gender-based violence (GBV) during or before pregnancy is a leading cause of maternal mortality due to homicides, suicides, and other health consequences. India's healthcare settings often lack comprehensive GBV care, contributing to poor maternal and child health outcomes.

This project aims to integrate evidence-based GBV interventions into antenatal and post-natal care services, particularly in rural and tribal areas, to address the violence-related threats to maternal and newborn health.

Principal Investigator(s): Bushra Sabri

Other faculty member(s) involved:

Jacquelyn Campbell

Duration: 47 months

Location(s): Uttar Pradesh

Funding Sources: Johns Hopkins School of Nursing

Partners: Aligarh Muslim University, Tata Institute of Social Sciences may be interested in participating in the large-scale trial

The study will build evidence for an intervention that will contribute to safety and health concerns of mothers and their children in prenatal and post-natal care in rural and tribal communities in India.

Pneumonia Research and Vaccine Impact League (PREVAIL)

India accounts for a disproportionately high fraction of the global pneumococcal disease burden compared with its population size, mostly due to subnational regions of very high rates of disease compared with other states in the country and other countries in the world. The Indian government's strategy of introducing the pneumococcal conjugate vaccine (PCV) into the national immunization schedule in a phased manner in the highest-burden regions of the country is a bold and welcome step towards reduction of child mortality in India. In order to measure the impact of these vaccination strategies robust surveillance systems need to be established in these high-burden geographic regions.

Principal Investigator: Aastha Kant

Location: Haryana

Partners: Maulana Azad Medical College (MAMC), New Delhi, India

PREVAIL is a partnership led by BSPH, International Vaccine Access Center (IVAC), in collaboration with Maulana Azad Medical College (MAMC), and is designed to evaluate the impact of PCV introduction in the Indian Universal Immunization Program (UIP). The primary aim is to determine the impact of PCV by measuring differences in vaccine-serotype colonization among hospitalized children aged 1-35 months, as well as differences among healthy community children 1-35 months, comparing those enrolled at sites where PCV has been introduced to those at sites where PCV has not yet been introduced. This study will establish and maintain a surveillance network in five Indian states to measure the impact of routine infant vaccination with PCV on serotypes causing invasive pneumococcal disease (IPD) among young children under 5 years of age in India. We also aim to fill evidence gaps by documenting and quantifying the economic value of disease control provided by PCV use, by estimating costs associated with pneumonia disease and pneumonia hospitalization. Key activities to be established in India include leadership in surveillance activities, robust data management systems and data dissemination activities.

With coordinated efforts to establish surveillance and perform impact evaluation of the sub-national PCV rollout, data needed to inform policy and sustain the PCV rollout will be made available to support Indian policy makers as the country makes good progress in reaching global priorities set for reducing childhood mortality.

Integrated Women in Health Network (iWIN), TAKEDA - Strengthening Care for Women's Health in their Life Course

Takeda Pharmaceuticals supports the Jhpiego-led, five-year Integrated Women in Health Network (iWin) project, which addresses systemic and operational challenges in the delivery of maternal and newborn care in India. The iWin project is doing this by leveraging new advancements, technology and finance to create a maternal and child health unit that will:

- Create an integrated platform for delivery and access to antenatal, postnatal and intrapartum care services across the public health system;
- Integrate machine learning and predictive analytics;

- Integrate point-of-care diagnostics;
- Leverage innovative financing tools and long-term partnership mechanisms to increase domestic resource mobilization and facilitate government participation and buy-in; and
- Empower auxiliary nurse midwives and Accredited Social Health Activists to deliver client-centered, continuous and coordinated antenatal and postnatal care. Consortium partners include Intellectap and Accenture Development Partnerships.

Key Objectives of the project:

- **Create an integrated public-private system** for continuous, quality, and accessible care at all levels, Integration across sectors through Total District Approach, and Integration across domains: Advocating for maternal nutrition as essential element for Healthy motherhood.
- **Developing an integrated, longitudinal tracking data platform** with machine learning layers to improve service delivery and decision-making - Enhancing the Technology Environment, End-to-end tracking of maternal events, Integration of PoC IoT Devices,
- **Build strategic technical, digital and programmatic capabilities** within the health system to deliver quality MNH care for all
- **Create a holistic enabling environment** to scale the integrated MNH system to other geographies within India and beyond

Born Healthy – Scale Up (CIFF- Born Healthy 2.0)

CIFF's Born Healthy (BH) investment, implemented by Jhpiego, successfully addressed this challenge in Rajasthan and found that women who presented early for their first ANC reduced instance of LBW by 30%. The investment delivered an evidence-based package of services, through existing government infrastructure that improved the quality and coverage of ANC care, with special focus on maternal infections that averted 31,000 LBWs and inspired interest from National and State governments. The proposed investment (Born Healthy Scale up) will scale and adapt learnings from BH to demonstrate a model for reducing LBW in 22 districts of 9 high priority States. The scale-up will also develop capacity of government institutions at National and State level and share evidence to inform government budgetary inclusions for sustainability and further expansion in all 271 districts (with a potential to avert 200k LBW annually).

The objectives and activities planned are based on learnings from BH and by 2028, this investment will aim to achieve:

Objective 1- Adapt and scale BH interventions through government health systems to demonstrate improvement in coverage and quality of ANC in 22 high priority districts to build confidence of 9 states resulting in

- Reduced prevalence of LBW by 10% from baseline level: i.e., ~50,000 additional LBW averted in 22 districts.
- Increased registration of ANC in first trimester by 30% (leading to 4.2 million women as per NFHS 5).

Objective 2- Create structures and support the ecosystem for effective and sustainable scale up

- Establish National Knowledge Management Partner in All India Institute of Medical Sciences (AIIMS) Delhi to host the National Technical Advisory Group (NTAG) to the Government of India (GoI).
- State government institutes identified in 9 states and their capacities built over the course of the investment, to ensure effective transition and support to government for further scale up. Active collaboration between National and State Institutes.
- Learnings from BH digital platform shared with national stakeholders to inform national digital platform.
- Data and evidence regularly shared with national and state governments to support inclusion of Point of Care testing (PoC) Kits and High-Risk Pregnancy (HRP) tracking into government ANC guidelines and budgetary provisions for the same.
- A multi-stakeholder collaborative for maternal health to crowd-in private funding alongside additional public resources in 9 states.

DIGITAL HEALTH

Digital Health Exemplars (Exemplars In Global Health)

Despite increases in PHC investments globally, access to and use of primary healthcare services remains a challenge in several lower-middle-income countries. There is a need to advance PHC systems in LMICs by supporting country-level foundational reforms and synergetic progression across financing, supplies, human resources for health, and data. Over the last two decades, increased access to mobile phones, digital devices, and internet connectivity has introduced new opportunities to strengthen the delivery of primary

Principal Investigator(s): Smisha Agarwal

Other faculty member(s) involved:

Suruchi Gupta, Shivani Pandya, Lena Kan, Diwakar Mohan, Indu Bhushan, Patricia Mechael

Duration: November 2022 - November 2024

Location(s): Karnataka, Rajasthan, Andhra Pradesh

Funding Sources: Gates Ventures

Partners: IIHMR Delhi, IIHMR Bangalore

health care services. The recent WHO guidelines on “digital systems for health systems strengthening” recommended various digital strategies that could be employed to strengthen health systems. This project aims to understand the pathways countries take towards a mature digital ecosystem and the necessary implementation and contextual factors that must be addressed to achieve effective and scalable digitization of primary health care services. The project plans to identify the high-performing countries that have leveraged digital health transformation towards improving PHC service delivery and evaluate the successful strategies that can advance the integration of digital health into PHC systems for improved downstream population-level health outcomes. Understanding “what worked for whom in what setting” is crucial. A systematic analysis of strategies, investments, and activities over time and stage of implementation by country and across countries will enable us to detect where possible common patterns can inform policy recommendations to prospective countries and the global health community more broadly. Moreover, our analysis allows us to identify factors which have the potential to facilitate or limit digital health transformations – and understand efficient strategies, policies and practices towards achieving digital transformations, if any.

The project will document narratives that showcase digital health transformation, detailing use-cases, financing models, and public-private partnerships that facilitate digital health adoption. This research will contribute to long-term learnings on what strategies work best for achieving efficient, scalable, and sustainable digital health ecosystems in India and globally, potentially saving indirect costs and enhancing health outcomes.

Evidence for Digital transformation (EDiT) project

Principal Investigator: Diwakar Mohan

Other faculty member(s) involved: Amnesty Lefevre; Kerry Scott

Location: Uttar Pradesh

Project Description: The overarching goal is to provide learning support for Digitization Programmes for Comprehensive Primary Health Care under Ayushman Bharat in Uttar Pradesh, India.

Duration: November 2022 - October 2025

Sponsor / Donor(s): Gates Foundation

Partners: National Health Mission, Uttar Pradesh

SOCIAL AND BEHAVIORAL CHANGE

Knowledge SUCCESS

Rapid advancements in knowledge management and technology are essential to address the gaps in family planning and reproductive health (FP/RH) services globally, especially in developing regions. The USAID Knowledge SUCCESS project aims to enhance the capacity for knowledge creation, dissemination, and utilization in FP/RH, fostering collaboration and engagement among professionals and institutions. The USAID flagship Knowledge SUCCESS project, initiated in 2019 and continuing until 2025, serves as a neutral knowledge broker in the global health sector, focusing on FP/RH. Managed by the Johns Hopkins Center for Communication Programs (CCP), the project employs a regional structure and co-creation approach to enhance the flow of information and collaboration among health professionals.

Principal Investigator(s): Debora Freitas Lopez, Tara Sulliban

Duration: 2019-2025

Location(s): The program is regionally based, including significant activities in India.

Funding Sources: USAID

Partners: Center for Communication Programs (CCP); CCCI (supporting KM activities in India and Asia)

The project's mission is to simplify the process for FP/RH professionals to find, share, and apply relevant technical information in their programs. By creatively blending established KM methods with cutting-edge technology and design practices, Knowledge SUCCESS establishes connections and skills that foster routine collaboration among stakeholders. The primary goals of the Knowledge SUCCESS project include:

- Develop regional and local capacities in knowledge management (KM) to ensure effective exchange and use of information among FP/RH professionals.
- Establish a culture of collaboration that enables FP/RH professionals to share relevant technical information and best practices.
- Align with USAID's localization strategy by building local institutional capacity and promoting knowledge exchange within the Asia region.
- Produce practical, trusted, and timely FP/RH technical content that addresses the needs of practitioners.

The project collaborated with youth-led organizations in the Asia region, notably in Nepal, to foster youth participation in FP/RH initiatives. An illustrative article detailing these efforts can be found [here](#). The first Asia Learning Circles cohort in 2022 highlighted insights on engaging men and boys in FP/RH, with a summary of learnings available [here](#).

Through the Knowledge SUCCESS project, measurable outcomes such as improved access to FP/RH resources, increased collaboration among health professionals, and enhanced knowledge exchange have been documented. The project aims to create a sustainable framework for knowledge management that empowers local institutions, resulting in better service delivery and health outcomes for communities in India and beyond.

Related Publications:

1. Salem RM, et al. (2024). "It's time to share our failures." Stanford Social Innovation Review. [Read here.](#)
2. Salem RM, et al. (2023). "Ensuring equal participation and inclusion in a knowledge exchange initiative." Knowledge Management for Development Journal. [Read here.](#)
3. Salem RM, et al. (2022). "What drives knowledge seeking, sharing, and use among family planning professionals?" Global Health: Science and Practice. [Read here.](#)

Documentation and Dissemination of the Tamil Nadu Health System Reform Program (TNHSRP)

The Tamil Nadu Health System Reform Program (TNHSRP) is a transformative initiative aimed at strengthening the healthcare framework in Tamil Nadu, India. Supported by the World Bank, this program aligns with the Sustainable Development Goals (SDG 3), which seek to ensure healthy lives and promote well-being for all individuals. Given the rising prevalence of non-communicable diseases (NCDs) and the need for effective healthcare delivery, the TNHSRP focuses on comprehensive reforms across the health system.

Principal Investigator(s): Sanjeeta Agnihotri (CCCI SDR)

Duration:

Location(s): Tamil Nadu

Funding Sources: The World Bank

Partners: Lead partner - CCCI Social and Development Research (CCCI SDR); Center for Communication Programs (CCP); The Department of International Health (DIH) at the Johns Hopkins Bloomberg School of Public Health

The project encompasses two critical components:

- **Documentation:** Development of comprehensive resources, including How-to Briefs, Case Studies, and Video Blogs, that capture the program's impacts and effective practices. These materials serve as a repository of lessons learned and successful strategies from TNHSRP.
- **Dissemination:** The organization of a Knowledge Exchange Conclave in Chennai, where stakeholders such as policymakers, health professionals, and development partners gathered to share insights and outcomes from the project. This event facilitated knowledge sharing and discussions on future directions for healthcare reforms.

The project documented a variety of health system strengthening initiatives of TNHSRP. This includes - development of case studies, how to briefs, video blogs and reports on initiatives like quality of care, population health registry, health assemblies, NCD strategy, etc. These knowledge products were disseminated at a Knowledge Exchange Conclave in Chennai, attended by 120 participants from other states in India and LMICs. These products will be available on TNHSRP website for other organizations to review, learn and share. The project not only contributes to enhancing healthcare in Tamil Nadu but also serves as a valuable resource for health systems reform in similar contexts globally.

Social and Behaviour Change Communication (SBCC) Strategy for Mitigation of Lead & Other Heavy Metal Contamination in Water Sources

Heavy metal contamination in water sources poses a significant health risk to individuals and communities, particularly in regions with high levels of industrial activities, agricultural practices, and the use of contaminated household products. Exposure to lead and other heavy metals can lead to serious health issues, including cognitive impairment, developmental delays, and various chronic conditions. In response to this pressing issue, Jhpiego commissioned CCCI Social and Development Research (CCCI SDR) to develop a comprehensive SBCC strategy aimed at preventing and mitigating lead and heavy metal contamination in water sources in Madhya Pradesh and Chhattisgarh. The project was focused on raising awareness, promoting safe practices, and encouraging community action to reduce exposure to these harmful contaminants.

Principal Investigator: Sanjeeta Agnihotri

Duration:

Location(s): Madhya Pradesh and Chhattisgarh

Funding Sources: Jhpiego

A thorough desk review and situational analysis were conducted in Madhya Pradesh and Chhattisgarh to understand the extent of contamination and its impact on local populations. Based on the findings, an SBCC strategy was developed to guide interventions designed to mitigate the risks associated with lead and other heavy metals. The project also involved the creation of targeted SBCC materials intended to inform and empower communities, with these materials undergoing a pre-test to ensure their effectiveness and cultural relevance.

This SBCC strategy is truly groundbreaking, both in India and globally, as it addresses heavy metal contamination through a multifaceted approach combining awareness, safe practices, and community engagement. By tailoring interventions to local conditions in Madhya Pradesh and Chhattisgarh, it sets a precedent for effectively combating environmental health risks. The strategy's innovative use of targeted materials and rigorous pre-testing ensures a culturally relevant and impactful response, promising significant improvements in public health and environmental safety.

Momentum for Safe Surgery in Family Planning and Obstetrics (MSSFPO)

The MOMENTUM Safe Surgery in Family Planning and Obstetrics (MSSFPO) project is a collaboration between the Center for Communication and Change – India (CCC-I) and Johns Hopkins Center for Communication Programs (CCP), that is part of a broader multi-country effort funded by the U.S. Agency for International Development (USAID). The project aimed to enhance the quality of care and access to safe surgical services in family planning and

Principal Investigator: Debora Freitas Lopez

Other faculty members involved: Uttara Bharath Kumar

Duration: November 2020 - June 2025

Locations: Assam, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, and Odisha

Funding Sources: USAID

Partners: EngenderHealth

obstetrics, ultimately accelerating reductions in maternal, newborn, and child mortality and morbidity.

In India, MSSFPO focused on six high-priority states: Assam, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, and Odisha. The project sought to support the Government of India in building awareness, equitable access, and provision of high-quality, voluntary, and consented safe surgical services, particularly in three key obstetric areas: Caesarean delivery, prevention and treatment of obstetric fistula, and voluntary uptake of Long-Acting Reversible Contraception (LARCs).

A Human-Centered Design (HCD) approach was used throughout the project, which was instrumental in creating effective prototypes to improve provider-client communication, build trust, reduce stigma and misconceptions, and address social norms impacting the uptake of these services. This innovative approach was pivotal in developing provider-focused solutions, including empathetic counseling services and self-learning tools for frontline workers such as ASHAs, ANMs, and Rashtriya Kishore Swasthya Karyakram (RKSK) Peer Educators. These workers interacted with a diverse group of individuals, including young men and women in the reproductive age group, expecting parents, and pregnant women. CCC-I also developed various supportive materials, including empathy videos, leaflets, and counseling tools in three languages to ensure broader reach and understanding. The empathy videos, produced in the third year, served as training tools to enhance the capacity of frontline workers in delivering compassionate and effective care. One of the key highlights of the project was the Design Thinking Workshop on Social and Behavior Change (SBC) solutions for improving the uptake of voluntary and informed modern contraceptive choices among youth, with a particular focus on LARCs and contraceptive equity. Held on 27-28 February 2023, this in-person workshop in Madhya Pradesh aimed to co-create solutions that addressed provider biases and social norms that limit engagement with youth in family planning services. The workshop engaged a multi-disciplinary team of stakeholders, including critical providers of FP services, influencers, and those who could support the service provision ecosystem.

When research insights showed that the lack of empathetic counseling was one of the key barriers to positive obstetric outcomes, Human-Centered Design was used to involve health workers and doctors in the process of developing interventions to address this. The ASHA workers who participated in the process said this was the first time they had been consulted and involved in developing tools that they would use. While looking at the challenge of how to get more fathers involved in the process, the ASHAs came up with the need to include images, language and content that included the father (in addition to the mother) in the tools. This proved to be critical as the pre-testing showed that the fathers now felt more included and relevant in the process of pregnancy, delivery and post-partum care.

NURSING

Mission Unnayan (Parivartan- Transforming the Nursing Workforce in BIHAR)

Mission Unnayan, or 'Transforming the Nursing Workforce in Bihar,' is a Government of Bihar-supported and Bill & Melinda Gates-funded initiative to improve the quality of nursing education and nursing professionals in the state. The Mission was launched by Shri Samrat Chaudhary, Deputy Chief Minister, Government of Bihar, on 7th March 2024.

Principal Investigator: Jhpiego
Duration: March 2024 to present
Location: Bihar
Funding Sources: Bill & Melinda Gates Foundation
Partners: Government of Bihar

- The initiative seeks to build on the successes of in-service training by reforming pre-service education, promoting continuous professional development through engagement with professional associations, and ensuring efficient placement of nurses in both government and private sectors.
- Creates a pool of technically competent nurses capable of delivering quality services, accessing ongoing skill development, and assuming leadership roles.
- Utilizing a human-centric design approach, a robust quality assurance and improvement mechanism for nursing education is being implemented. This model is being prototyped and will be tested and scaled across the state through a community-driven and sustainable business model.
- Policy reforms are being undertaken to support professional development within the existing nursing cadre and foster leadership, enabling nursing professionals to actively participate in crucial health system decisions and contribute to improved governance.
- Creating an ecosystem that facilitates employment for Bihar's nurses in public institutions and private hospitals through campus recruitment while enhancing their competitiveness in the international job market.
- Furthermore, digital technology, such as learning management systems, is being leveraged to streamline nursing education, records management, and placement processes.

The Mission aims to shift this perception by creating better job opportunities through upskilling and aligning salaries with clinical competencies. Building linkages across the ecosystem—schools, alums, and employers—will ensure a steady supply and absorption of qualified nurses.

The outcome of the project is to create a highly skilled and job-ready cohort of nursing graduates with essential skills required to meet the demands of the healthcare sector in the public and private sectors in Bihar, nationally, and internationally; and better healthcare outcomes, increased efficiency, and a more engaged healthcare workforce will have a positive impact on Bihar's public health system.

Addressing Mental Health Crisis among Nurses

The COVID-19 pandemic had a profound impact on nurses, who faced significant personal and professional challenges as frontline workers. They managed patients with acute morbidity, increased workload, and overwhelmed health systems, while managing their own fear of virus transmission and family responsibilities. These circumstances contributed to adverse mental health outcomes for many nurses. Mental health-related demands facing nurses in both India and the U.S. were identified as an area of critical concern.

Principal Investigator: Nancy Reynolds

Location: CMC Vellore

Partners: Johns Hopkins Gupta-Klinsky India Institute, COVID Task Force and the Johns Hopkins School of Nursing Center for Global Initiatives, CMC Vellore and the Johns Hopkins and CMC Vellore World Health Organization Collaborating Centre

The Johns Hopkins School of Nursing and Johns Hopkins Gupta-Klinsky India Institute (GKII) partnered with the College of Nursing, Christian Medical College (CMC), Vellore, India to offer a series of webinars focused on Covid-related mental health issues to nurses in India. The webinars were highly successful. This webinar series attracted 11,139 registrants, over 4,400 live attendees, and over 2,100 recording views globally. Feedback on the webinar series content was very positive. However, a recurrent theme was a need for additional mental health training and support. A collaboration was initiated to extend mental health resources and support available to nurses in India. Five JHSON Doctor of Nursing Practice students, along with JHU faculty, and CMC faculty are now developing the following initiatives:

- **Virtual Health Education:** a Virtual Mental Health course is being developed that teaches nurses mental health support techniques. The course includes a series of lectures and interactive exercises. The course will address how to deal with stress and anxiety, support patients experiencing distress, and enhance mental health through counseling and mindfulness/grounding exercises.
- **Mental Health App:** An interactive app is being developed that provides mental health support to nurses/nursing students. Development and pilot testing of the app is underway.

This partnership exemplifies the value of international collaboration. By pooling resources and expertise across cultural contexts. The initiative not only disseminated crucial knowledge but also cultivated a sense of global community among nurses. The success of this collaboration underscores the potential of such global partnerships for healthcare institutions worldwide, offering avenues to share best practices and enhance support systems for nurses confronting similar crises globally.

Integrating a Maternal and Child Safety, Health and Empowerment Program into Antenatal and Postnatal Care Services for Rural and Tribal Women in India

Gender-based violence (GBV) (including homicide) is one of the leading causes of maternal and child (fetus, newborn or infant) mortality and morbidity in limited resource settings such as India. Comprehensive healthcare services that include GBV risk assessment and intervention can play an important role in preventing maternal and child mortality and morbidity. Rural/tribal women are at high risk for various forms of GBV and its maternal and child health (MCH) consequences.

In Phase I formative phase, the study collected preliminary data for developing a GBV screening and intervention to enhance MCH and safety of women in rural and tribal areas in India. Using a mixed methods design, interviews were conducted with women residing in rural and/or tribal regions in India along with key informant interviews with practitioners serving women in rural and/or tribal regions

in India. Survey data was collected from survivors of GBV from rural or tribal regions to examine the predictive validity of the Danger Assessment (i.e., instrument designed to assess risk for repeat GBV, severe GBV and/or homicide) for revictimization by GBV. Findings from the formative Phase I created an GBV screening and WC-SHE (Women and Children-Safety, Health and Empowerment) intervention program for pregnant women seeking ANC/PNC services in rural and tribal regions in India. In Phase 2, the study evaluated the feasibility, acceptability and preliminary efficacy of WC-SHE. The next steps of the study will be a large scale efficacy trial of the screening and intervention program.

Principal Investigator: Bushra Sabri

Location: Uttar Pradesh

Partners: State Department of Health and Family Welfare, Government of Uttar Pradesh; Department of Social Work, Aligarh Muslim University

The WC-SHE components led to reduction in GBV, improved psychological recovery and women's greater control over their personal safety. It also led to positive outcomes in terms of post-pregnancy safety practices for self- and children. Additionally it led to improvement in child health and safety outcomes, making WC-SHE as a promising approach for supporting pregnant and post-partum women in abusive relationships in rural and tribal regions in India.

“Neighborhoods of Care” by LEAP

India's rural communities often face healthcare disparities, driven by limited access to health and social services. Standard healthcare models struggle to address these complex issues, which require a more

community-centered approach that involves local participation and builds on residents' needs and experiences. Recognizing this, the Neighborhoods of Care initiative seeks to establish a continuum of care that links health, social security, and community support systems.

Principal Investigator: Andre Nogueira

Location: Bill and Melinda Gates Foundation

Partners: Transform Rural India Foundation

Neighborhoods of Care, developed by Leap in partnership with the Transform Rural India Foundation, builds a new healthcare delivery model tailored to the needs of rural populations in India. This program introduces three core components—a support network, a service platform, and a knowledge system—to enable residents to access comprehensive health and social services in their homes, social spaces, and local health facilities. By engaging community members as active participants in their own care, this initiative reimagines health delivery, viewing every resident as both a recipient and a provider of care. The program emphasizes education, community engagement, and sustainability.

This initiative aims to improve quality of life and resilience in rural India by creating a healthcare model that offers preventive, curative, and aspirational services. By fostering self-reliance in health management, the project strengthens local capacity, enhances public health outcomes, and informs policy recommendations for broader adoption.

TOBACCO CONTROL

These projects collectively address critical public health challenges posed by tobacco use in India. They aim to inform policy development and implementation strategies to enhance tobacco control measures, improve public awareness of health risks, and promote compliance with existing regulations. By engaging with local communities, stakeholders, and policymakers, these studies seek to create a healthier environment and reduce the burden of tobacco-related diseases in India.

Beedi Rollers' Health Harms

This case-control study aims to determine the health harms associated with bidi rolling, a traditional method of rolling tobacco. The project employs a combination of questionnaires, clinical assessments, and qualitative interviews to gather comprehensive data. The project seeks to raise awareness of occupational health risks faced by bidi rollers and could lead to stronger health protections for this vulnerable workforce.

Principal Investigator: Joanna Cohen
Other Faculty Members involved: Ram Ramachandran
Duration: June 2022 - December 2024
Location(s): Maharashtra, Telangana, Uttar Pradesh
Funding Sources: Bloomberg Philanthropies
Partners: All India Institute of Medical Sciences

Tobacco-related litter assessments

This study aims to assess tobacco-related litter in urban environments, focusing on identifying, quantifying, and classifying litter types while determining branding and visibility of health warnings.

The project advocates for plain and standardized packaging of tobacco products to reduce post-consumption marketing and demand, potentially decreasing environmental impacts and promoting public health.

Principal Investigator: Ryan Kennedy
Other Faculty Members involved: Kevin Welding
Duration: October 2022 - June 2024
Location(s): Kolkata
Funding Sources: Bloomberg Philanthropies
Partners: Manbhumi Ananda Ashram Nityananda Trust

Key Informants' Perception of Standard Bidi Packaging

This project interviews key informants to gauge perceptions regarding the implementation of standardized bidi packaging, considering the decentralized bidi manufacturing system in India. The data collected will help identify challenges and opportunities for standardizing bidi packaging, ultimately aiding in improving health warning label visibility and compliance.

Principal Investigator: Lauren Czaplicki
Duration: September 2023 - April 2025
Location: Hyderabad
Funding Sources: Bloomberg Philanthropies
Partners: Metis Analytics, WHO India Office, Vital Strategies

Standard Packaging for Smokeless Tobacco

The study explores current perceptions of khaini packaging among users and non-users in India, focusing on proposed standard pack designs and health warning label placement.

The findings will support advocacy for effective packaging regulations that enhance health warning label visibility on smokeless tobacco products.

Principal Investigator: Lauren Czaplicki
Duration: October 2022 - December 2023
Location(s): Jharkhand, Maharashtra, Uttar Pradesh
Funding Sources: Bloomberg Philanthropies
Partners: Manbhumi Ananda Ashram Nityananda Trust

Compliance with India's E-Cigarette Ban (Pilot Study)

This pilot study investigates the purchasing behaviors of users regarding electronic nicotine delivery systems (ENDS) and heated tobacco products (HTPs), focusing on vendor types, product preferences, and user motivations. Insights from this study will aid in designing a compliance study to enforce e-cigarette regulations effectively by understanding user purchasing patterns.

Principal Investigator(s): Lauren Czaplicki
Duration: November 2023 - December 2024
Location(s): PAN India
Funding Sources: Bloomberg Philanthropies
Partners: Manbhumi Ananda Ashram Nityananda Trust

Designated Smoking Areas

This study assesses the compliance of designated smoking areas (DSAs) in hospitality venues with the Cigarettes and Other Tobacco Products Act (COTPA) enacted in 2003, across five major Indian cities. Insights from this study will aid in designing a compliance study to enforce e-cigarette regulations effectively by understanding user purchasing patterns.

Principal Investigator: Kevin Welding
Duration: August - December 2024
Location(s): Delhi, Mumbai, Chennai, Kolkata, Bengaluru
Funding Sources: Bloomberg Philanthropies
Partners: Metis Analytics



Climate

Hydrological Modeling for REAL-Water Water Resource Management Project

Rural communities in India are increasingly threatened by water scarcity due to climate change and insufficient resource management. Addressing these risks requires comprehensive planning to ensure sustainable water access and safeguard public health.

Principal Investigator(s): Benjamin Zaitchik
Duration: December 2023 – September 2026
Location(s): Karnataka, Tamil Nadu, Telangana
Funding Sources: USAID
Partners: Aquaya (consulting group leading the multi-country REAL-Water project), WELL-Labs

This project is part of the broader REAL-Water initiative, which addresses critical challenges in rural water supply and water resources management in India. The team investigates key questions surrounding water resources threats, holistic water planning, and factors influencing effective resource management. To support this effort, a Hydrological Modeling subproject will be completed that will provide baseline water availability analysis, projections of future water availability, and quantitative estimates of water demand based on simulation and observation. The proposed work will accomplish these goals through use of NASA Land Information System Land Data Assimilation capabilities. The JHU research team will produce, evaluate, and optimize simulations of the distributed water balance of study areas in peninsular India over the past 25 years. The system will then be used to generate projections of the water balance under different future climate scenarios. Demand analysis will be performed using prognostic irrigation water use models and through demand scenarios informed by satellite observation and field survey conducted by Indian institutional partners on the project.

By delivering in-depth data on water availability and demand, the project aims to inform national and local water policy in India, helping mitigate climate change impacts and support long-term water resource planning for drinking water access and expansion.

Policy Actions for India-US Collaborations on Climate and Health

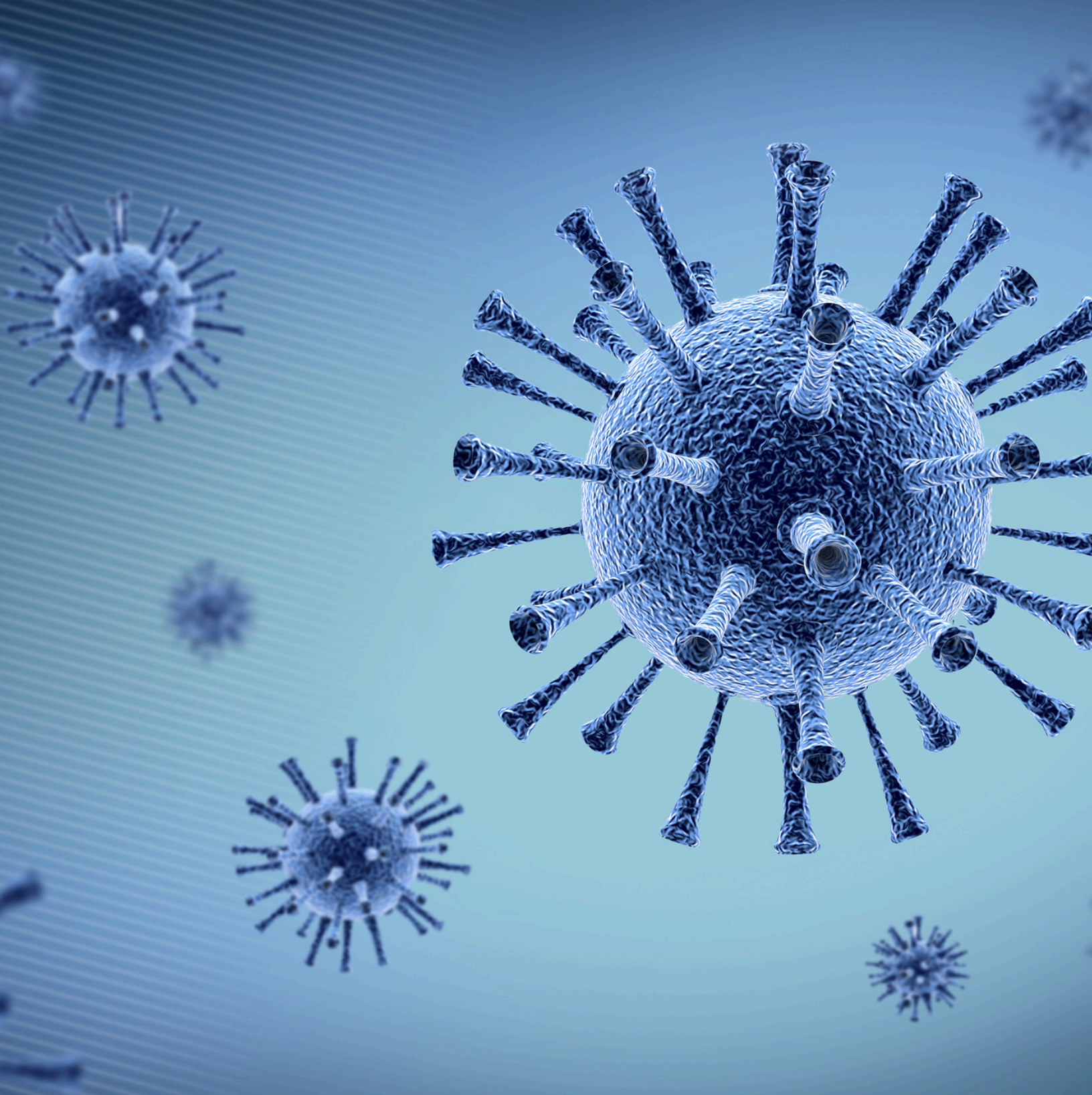
Climate change is intensifying infectious disease risks in both India and the U.S., with serious implications for public health. US and India can leverage past and current collaborations and develop coordinated policy actions to address the adverse impacts of climate change on human health, especially greater infectious disease risks.

Principal Investigator(s): Gigi Gronvall
Other faculty member(s): Aishwarya Nagar
Duration: Feb 2024 – July 2025
Location(s): PAN India
Funding Sources: Gupta-Klinsky India Institute
Partners: Johns Hopkins Center for Health Security

The purpose of this study is to identify conceptual areas and opportunities where India and the US can collaborate to mitigate and address infectious disease risks brought on by climate change, advance health security, and strengthen bilateral national ties. The study aims to understand (1) priority conceptual areas for addressing infectious disease risks precipitated by climate change in India and the US, (2) policy actions that

India and the US want to pursue to address infectious disease risks precipitated by climate change and, consequently, to advance health security, and (3) how both countries' priorities regarding infectious disease risks precipitated by climate change fit into broader bilateral agendas around biosecurity and health security. Key activities include stakeholder mapping, interviews with subject matter experts and key informants (academic, government, non-profit, and private sector), and reviews of peer-reviewed literature and grey literature documents.

Findings from this study are expected to shape future India-US collaborations on health security, highlighting actionable policies for addressing infectious disease threats exacerbated by climate change. The insights will support joint efforts to mitigate biosecurity risks, reinforcing both nations' ability to respond to climate-health challenges.



Infectious Diseases

Tuberculosis

TUBERCULOSIS (TB)

Tuberculosis Transmission and Preventive Therapy in Tibetan Children and Young Adults in India

Tibetan refugee children in India face high TB exposure, posing a significant public health risk. Implementing comprehensive screening and preventive therapy can mitigate TB transmission among these vulnerable populations.

Principal Investigator: Kunchok Dorjee

Duration: June 2020 - May 2025

Location: Himachal Pradesh

Zero TB in Kids is a comprehensive tuberculosis screening, preventive therapy and community mobilization program carried out in collaboration with partners in India and Nepal to eliminate TB in schoolchildren. Dr. Dorjee seeks to understand optimum strategies for implementation of TB screening and TB preventive treatment and determine TB transmission dynamics using whole genome sequencing and spatial epidemiology. The program leverages modern technology including artificial intelligence enabled image reading, point-of-care assays, ultra-short course treatment regimen and digital contact tracing and case management systems to improve disease diagnosis and health outcomes.

Over 30,000 individuals have been screened, leading to an 87% reduction in TB incidence among Tibetan refugee children in India. The project provides a robust model for TB elimination, utilizing modern technology to identify and prevent TB in high-burden settings. It has shown notable success among Tibetan refugee children and could be adapted to other high-risk communities, contributing to global TB control efforts.

TB Aftermath

People treated for TB have high incidence of recurrent disease. A recent analysis of the TB treatment cascade in Indian public-sector hospitals estimated that under 40% of cases were TB free one year following treatment completion and as much as 13% of reported TB per year in India is recurrent TB. Furthermore, India is home to one-third of the world's estimated three million undetected TB cases. Thus, active case finding (ACF) approaches targeting recently treated TB cases may be an effective strategy to reduce the global burden of TB. The Indian National TB Control Programs (RNTCP) new strategic plan for TB elimination strongly recommends developing and implementing a scalable surveillance system for recurrent TB. The World Health Organization's Systematic Screening for Active TB guidelines suggest that screening for recurrent TB in treated TB patients is a "conditional recommendation"; conditional only because there is a lack of evidence.

Principal Investigator(s): Jonathan Golub

Duration: June 2020 - May 2025

Location(s): PAN India

The overall goal of our tuberculosis (TB) Aftermath study is to identify, implement and measure feasible case finding strategies and identify key populations to screen among treated TB patients in India. The TB Aftermath study evaluates two active case-finding (ACF) strategies—household ACF and telephonic ACF—to identify

recurrent TB cases among recently treated TB patients. Aiming to provide essential data for scalable interventions, the project will analyze the feasibility, cost-effectiveness, and impact of these strategies in collaboration with India's National TB Control Program.

This study addresses a gap in recurrent TB management by generating evidence for an effective surveillance system. Its findings could guide national TB programs, helping to reduce TB re-emergence and enhancing long-term TB control efforts in India.

Hybrid trial for alcohol reduction among people with TB and HIV in India

Co-occurring alcohol use disorders and TB/HIV in India create treatment adherence challenges and increase risk of poor health outcomes. Integrating alcohol reduction strategies into TB/HIV care could improve treatment success rates and patient health.

Principal Investigator: Amita Gupta
Duration: November 2023 - May 2025
Location(s): PAN India

This trial examines the impact of the HATHI intervention, a combined Cognitive Behavioral Therapy/Motivational Enhancement Therapy (CBT/MET) approach, on reducing alcohol consumption in TB and HIV patients. Comparing it with usual care, the study evaluates the intervention's effects on TB and HIV treatment adherence and explores its feasibility and cost-effectiveness in healthcare settings.

By integrating the HATHI intervention into TB and HIV treatment settings, the study aims to improve TB and HIV treatment outcomes, such as reducing TB treatment default rates, increasing medication adherence, and enhancing retention in care. Additionally, the project seeks to identify barriers and facilitators to implementing alcohol treatment in these healthcare settings and evaluate the cost-effectiveness of the intervention. The results could lead to more comprehensive and effective care models for patients with TB and HIV, particularly those with co-occurring alcohol use disorders, thereby improving overall health outcomes and quality of life.

RePORT India Phase II

The goal of this project is to enhance research capacity and continue to support building research capacity that combines prospective cohorts and biomedical and clinical research strengths. JHU will serve as the U.S. based

Principal Investigator: Amita Gupta
Duration: October 2019 - September 2024
Location(s): PAN India

network lead for RePORT India with Amita Gupta as the Chair. In this role, JHU will commit U.S.-based staff time to the Support Center coordinating alongside the India-based network lead, JIPMER. U.S. based investigators will also contribute to clinical epi analyses and execution of each of the proposed scientific aims.

As the U.S. network lead for RePORT India, JHU will play a crucial role in coordinating efforts with the India-based network lead, JIPMER, enhancing collaboration between U.S. and Indian research teams. The project aims to advance scientific research through clinical epidemiology analyses and support the execution of key scientific objectives, ultimately contributing to the growth of research infrastructure and expertise in India.

Supporting, Mobilizing and Accelerating Research for Tuberculosis Elimination (SMART4TB)

SMART4TB is a 5-year cooperative agreement made possible by USAID that aims to transform TB prevention and care. SMART4TB will design and implement research studies with local partners to identify effective person-centered methods for finding, treating, and preventing TB; strengthen local capacity to conduct high-quality research; and engage communities to build demand for new interventions, drive policy change, and improve implementation of new and existing interventions to reach the End TB targets.

Principal Investigator: Richard Chaisson

Duration: August 2022 - July 2027

Location(s): India

Baseline pRescription According to Direct from Sputum Sequencing and TArgeted drug Concentration Strategy (BRASS TACS)

TB remains one of the most pressing global health issues, with India bearing a disproportionate share of the burden, particularly of multidrug-resistant TB (MDR-TB). Traditional treatment for MDR-TB is often delayed due to the reliance on slow, culture-based diagnostic methods, which can take up to two months to confirm drug resistance and determine effective treatment regimens. During this time, patients may receive "one-size-fits-all" MDR-TB treatments that can be inadequate and lead to increased drug resistance, severe side effects, and higher mortality rates.

Principal Investigator: Jeffrey Tornheim

Duration: April 2023 - March 2028

Location(s): Mumbai

The BRASS TACS project, based in Mumbai, India, addresses these challenges by evaluating a new approach combining rapid next-generation sequencing (NGS) and therapeutic drug monitoring (TDM) to tailor MDR-TB treatments more effectively from the outset. Dr. Jeffrey Tornheim and his team at Johns Hopkins University have built on a robust foundation of TB research, enrolling over 800 participants in past studies and developing comprehensive clinical and laboratory infrastructure at their Mumbai clinical site. This infrastructure includes resources for drug resistance testing, MIC testing, plasma drug level monitoring, and NGS—all critical tools for advancing MDR-TB treatment.

This study aims to improve TB treatment outcomes, particularly for multidrug-resistant TB (MDR-TB) in India, by evaluating a new diagnostic and treatment approach. By using rapid NGS from uncultured samples, the study seeks to predict drug resistance and minimum inhibitory concentrations (MICs) for MDR-TB within 2 days, enabling tailored treatment from the start. This approach, combined with early therapeutic

drug monitoring (TDM), aims to enhance treatment efficacy, reduce side effects, and shorten the time to effective therapy compared to traditional culture-based methods. The study will analyze the impact of these tools on patient outcomes, including resistance mutation detection, drug level targets, and overall treatment success, in a cohort of 210 MDR-TB patients in Mumbai. The results are expected to inform better personalized treatment strategies for MDR-TB globally.

Multiplexed detection of cell-free M. Tuberculosis DNA and its drug-resistant variants in blood

TB is the leading cause of death from infectious disease worldwide, with 10 million cases and 1.5 million deaths annually. Traditional methods for TB diagnosis, such as extended M. tuberculosis (Mtb) cultures and PCR-based assays, face challenges in diagnosing extrapulmonary TB, as well as TB in immunocompromised individuals. While PCR assays like Xpert MTB/RIF have improved diagnosis speed, they require specialized equipment and show reduced sensitivity in non-pulmonary TB cases.

Principal Investigator: Jeffrey Tornheim

Duration: August 2023 - July 2024

Location(s): India

The project focuses on developing an ultra-sensitive, blood-based diagnostic method to detect cell-free M. tuberculosis DNA (cfDNA), including drug-resistant variants. This approach is based on CRISPR-Cas12a technology, previously used for detecting trace amounts of SARS-CoV-2 RNA. Adapting it to TB diagnosis could enable rapid, on-site detection, bypassing the limitations of sputum-based diagnostics and providing insights into real-time treatment responses.

The importance of this project lies in the critical need for faster, more accessible, and more precise TB diagnostics. Key challenges in TB detection and treatment monitoring include:

- **Rapid Diagnosis Across TB Types:** Blood-based detection of circulating Mtb cfDNA can potentially identify all TB forms, distinguishing active TB from latent infections and overcoming the limitations of current immune-response-based assays.
- **Real-Time Treatment Monitoring:** The short half-life of cfDNA allows it to reflect ongoing pathological changes in the patient, enabling clinicians to assess treatment response and adjust regimens accordingly.

This project aims to revolutionize TB diagnosis and treatment monitoring by offering a sensitive, real-time diagnostic tool that can be easily implemented in resource-limited settings. By addressing the challenges of extrapulmonary TB detection and rapid treatment monitoring, CRISPR-TBD holds the potential to reduce TB transmission, improve personalized care, and inform public health strategies worldwide for managing TB and drug-resistant TB.

RePORT International: Innovative Modelling for Predicting Tuberculosis Treatment Outcomes in Global Cohorts

In places with high TB burdens, like India, the need for more personalized, adaptive treatment approaches is urgent. Current prediction methods rely primarily on baseline clinical data, overlooking the variability in individual responses throughout treatment. Addressing this gap could dramatically improve TB outcomes and provide more tailored care for patients worldwide.

Principal Investigator: Amita Gupta
Duration: April 2023 - March 2028
Location(s): India

The project aims to develop and validate concise predictive models using baseline and longitudinal clinical data, applying machine learning methods like random forests and penalized regression to identify critical variables and construct highly responsive models. By implementing these dynamic prediction models, RePORT seeks to improve TB outcome forecasting and enable early, personalized interventions, supporting targeted treatment adjustments to reduce TB recurrence and mortality, particularly in high-burden, resource-limited settings.

RePORT uses dynamic prediction models to enhance TB outcome forecasting and enable early, individualized interventions in diverse global cohorts. These advancements will support targeted treatment adjustments, ultimately aiming to reduce TB recurrence and mortality, especially in resource-limited settings where the disease burden is greatest.

Mentoring in Immunometabolism Dysregulation in TB and TB/HIV

TB remains the leading cause of death among people living with HIV (PLWH), largely due to gaps in understanding the immune mechanisms that control or eradicate *Mycobacterium tuberculosis* (Mtb) infections. PLWH with latent TB face a heightened risk of developing active TB, yet current diagnostics have reduced sensitivity and do not adequately predict those at the highest risk for disease progression. This project leverages longitudinal biorepositories and cutting-edge immunometabolic research to fill these critical knowledge gaps.

Principal Investigator: Petros Karakousis
Duration: July 2019 - June 2025
Location(s): India

This initiative examines metabolic and immune regulation markers that could predict the progression from LTBI to active TB, especially in vulnerable populations like PLWH. Trainees will analyze Indian and South African RePORT cohorts to understand immune and metabolic changes linked to TB progression. The project will also study how dysregulated potential anti-lipogenic treatments that could support immune function against Mtb. The project incorporates a strong mentoring component, providing a pathway for trainees to engage in impactful, patient-oriented research.

By identifying biomarkers that signal increased risk for TB progression and exploring therapeutic pathways targeting immune and metabolic dysfunction, this project holds the potential to greatly improve diagnostic accuracy, treatment adherence, and outcomes, particularly for PLWH. Additionally, the mentoring strategy aims to cultivate a new generation of researchers in patient-focused TB and TB/HIV research, advancing both scientific knowledge and global TB eradication efforts.

Innovative modelling for predicting TB treatment outcomes in global cohorts

This project aims to apply modern machine learning techniques to develop and validate models that predict adverse treatment outcomes for tuberculosis. Baseline and longitudinal data from multiple cohorts in India and Brazil will be used. Models will differentiate between adverse outcomes of treatment failure, recurrence, loss to follow up, and death.

Principal Investigator: Robinson Matthew

Duration: April 2022 - March 2024

Location(s): India

This project will enable early, data-driven interventions that reduce treatment failure, recurrence, and mortality. By improving prediction accuracy for adverse outcomes in high-burden settings, it could significantly enhance patient care and resource allocation.

ANTIMICROBIAL RESISTANCE

Artificial Intelligence empowered Diagnostic Test to distinguish bacterial vs. viral infection

During flu season, scientists are contemplating new, more efficient ways to differentiate between respiratory pathogens. Multiplex, PCR-based tests could save both healthcare providers and patients' lives. While there is significant focus on multiplex respiratory viral infection detection tests, with support from 2022 FCDP award, our group has developed a saliva-based extracellular vesicle

(EV)-RNA PCR assay that can detect COVID-19 along with FluA/FluB/RSV-A and -B and can also determine gram + or gram - bacterial infections with great precision, simultaneously. Non-invasive self-collected saliva samples for deployment of a highly sensitive assay is enabled by both a novel RNA panel and EV isolation platform. The principle of this assay based on EV cargo both host cell response against pathogen by secreting microRNAs and vRNA from viral infection. As we are examining only the host response for bacterial infection, and thus our current test is unable to determine the exact bacterial strain.

Principal Investigator: Sam Das

Other faculty members: Melania Bembea

Duration: August 2023 - September 2024

Location: Mumbai

Funding Sources: NIH/NCATS/SEED

Partners: Koita Centre for Digital Health (KCDH), IIT Bombay.

To overcome this limitation, we have developed an AI/ML algorithm to predict the exact strain of bacterial infection. The objective of this proposal is to clinically validate the diagnostic bacterial and viral test, and to train our AI/ML algorithm to identify exact bacterial strains, working with biostatistician/consultant for an FDA submission by pursuing two specific aims: Aim 1. To further validate multiplexing bacterial and viral detection assay using prospectively collected saliva samples. Aim 2. To identify the exact bacterial strain by utilizing AI/ML algorithm. This project advances this innovative assay from a research protocol towards a Lab Developed Test.

Antibiotic Stewardship is a major concern worldwide, especially countries like India where antibiotics can be purchased over the counter. Long-term goal of this project to develop an affordable and fast diagnostic test for the communities in India and also for the rest of the world. We have active to seek fundings from private and governmental sources to achieve our goals.

HIV

Integrating HCV Services into HIV Programs for PWID in India – Supporting Treatment Outcomes among PWID (The STOP-C Study)

With people who inject drugs (PWID) facing high rates of hepatitis C (HCV) and HIV co-infection, there is a critical need for integrated treatment models to optimize HCV care within HIV-focused programs. In India, PWID are especially vulnerable to both HCV and HIV, and

current healthcare strategies can benefit from targeted support that maximizes treatment efficacy across diverse needs. The STOP-C study leverages integrated HIV/HCV centers, employing precision-based randomization to tailor support intensity for PWID, thereby addressing their varying risk levels for HCV treatment failure. STOP-C is a multi-center, 3-arm randomized trial focused on optimizing HCV treatment outcomes by varying support levels in seven integrated across India. Participants are assessed for risk of treatment failure using a prediction model and are grouped as minimal or elevated risk. Those at minimal risk receive either low-, medium-, or high-intensity support (basic services, patient navigation, or navigation plus directly observed therapy), while those at elevated risk receive a higher proportion of intensive support.

All participants receive a 12-week course of oral direct-acting antivirals. By tailoring support based on need, the trial explores how different intensity levels of care impact sustained virologic response (SVR), the primary outcome of HCV clearance after treatment.

Principal Investigator: Shruti H. Mehta, Sunil S. Solomon

Duration:

Location(s): India

The trial's precision-based approach revealed significant variability in treatment failure risk across sites, highlighting diverse patient needs within the PWID population. The design allowed for evaluating treatment efficacy across risk profiles, adding insights into the average treatment effect while providing more detailed data for precision medicine approaches in healthcare. Additionally, the study demonstrates the viability of community health workers and patient navigators in supporting PWID, aligning with WHO-endorsed strategies for resource-limited settings. Cost-effectiveness analysis is ongoing and, combined with India's strong precedent for community-driven healthcare, could inform broader adoption of these strategies, improving HCV and HIV outcomes among PWID in India and potentially other low- and middle-income countries (LMICs).

leDEA Asia-Pacific: Epidemiology of HIV/AIDS and Comorbidities in a Public Antiretroviral Treatment (ART) Clinic in Pune, India

India, with 2.3 million people living with HIV, has the third-highest HIV burden globally, as well as the highest TB burden and rising NCDs such as diabetes and cardiovascular disease. The country's healthcare is complex with HIV patients often seeking care from both public and private clinics. Since 2004, the National AIDS Control Program has offered free antiretroviral therapy. BJ Government Medical College (BJMC) in Pune hosts India's largest HIV clinic, with over 26,000 registered patients since 2005. This project focuses on HIV in India, especially its interactions with TB and other NCDs.

Principal Investigator: Amita Gupta

Duration: July 2021 - April 2026

Location: India

- Aim 1: Establish an observational cohort database incorporating public sector HIV data at BJMC, which will be accessible to BJMC investigators and Indo-US collaborators, providing valuable insights for India's national program and shaping future research.
- Aim 2: Examine the natural history of HIV, associated comorbidities (e.g., TB, diabetes, alcoholism, malnutrition, cardiovascular disease), and outcomes of their treatment over time within this public sector clinic.

Aligned with the regional goal to build local research capacity in HIV epidemiology, this project will also use a recently awarded Fogarty TB/HIV training grant and ongoing studies to enhance research capabilities at BJMC.

This project aims to strengthen India's HIV response by creating an observational cohort database focused on HIV, TB, and NCD comorbidities. Using data from India's largest HIV clinic, it will inform national health programs and future research. Additionally, it will build research capacity at BJGMC through Indo-US collaborations and training grants, supporting improved management of HIV and related comorbidities for better patient outcomes and public health strategies.

Strategies to improve the HIV care continuum among key populations in India

This clinical trial will compare the effectiveness of integrated care centers vs. integrated care centers plus HIV patient treatment incentives for achieving HIV treatment targets among people who inject drugs and men who have sex with men in India. We will also assess cost-effectiveness and barriers and facilitators to implementation through targeted mixed-methods approaches. This study is a model for improving HIV treatment outcomes in key populations in low to middle-income countries.

Principal Investigator: Gregory Lucas

Duration: September 2015 - May 2024

Location: India

This clinical trial will assess the effectiveness and cost-efficiency of integrated care centers, with and without treatment incentives, in achieving HIV treatment goals for people who inject drugs and men who have sex with men in India. The findings aim to create a model for improving HIV outcomes in key populations across low- and middle-income countries.

Long-Acting Injectables for Treatment of HIV among PWID (LIFT HIV)

This study seeks to evaluate the efficacy, safety, acceptability and cost-effectiveness of long-acting antiretroviral therapy (LA ART) on viral suppression among virally unsuppressed people who inject drugs in New Delhi, India.

Principal Investigator: Sunil Solomon

Duration: April 2024 - March 2029

Location: New Delhi

If proven effective, LA ART could improve adherence, reduce HIV transmission, and offer a sustainable treatment alternative within this high-risk group, supporting India's broader HIV control efforts and informing policies for marginalized populations. Additionally, data on safety, acceptability, and cost-effectiveness could guide the scalability of LA ART in similar low- and middle-income settings globally.

Individual, Network and Spatial Drivers of HIV and HCV among PWID in India

This multisite cohort study is designed to evaluate the role of individual-, network- and spatial factors on HIV and HCV incidence among people who inject drugs in three Indian cities at varying stages of HIV and drug use epidemics. Additional objectives include the exploration of the transmission dynamics of HIV and HCV by overlaying phylogenetic and self-reported network- and spatial data, and the examination of the social diffusion of the HIV care continuum within drug using networks.

Principal Investigator: Sunil Solomon

Duration: September 2016 - May 2024

Location: New Delhi

By analyzing transmission dynamics with both phylogenetic and self-reported data, the study aims to identify key drivers of these epidemics in diverse urban settings, which vary in epidemic stage. Insights from this research could inform targeted intervention strategies and improve the HIV care continuum within drug-using networks.

HIV Services for Key Populations Affected by HIV/AIDS Activity

The overarching goal of this program is to design, implement and evaluate sustainable novel models of HIV testing and care that supports the Indian National Strategic Plan (NSP) for HIV/AIDS and STI 2017-24 aimed at improving access to HIV prevention and treatment services, and social protection schemes among key populations and their families in India.

Principal Investigator: Sunil Solomon
Duration: April 2019 - December 2026
Location: India

This program aims to advance India's National Strategic Plan by developing sustainable HIV testing and care models that enhance access to prevention, treatment, and social support for key populations.

PWID Opportunities to Improve TrEat and Retain (POINTER)

People who inject drugs (PWID) face a heightened risk of HIV infection and have poorer treatment outcomes compared to other key populations, especially in low- and middle-income countries (LMICs). In India, opioid use and new injection drug epidemics have surfaced

prominently in the Northern and Central regions over the past 5-10 years, contributing to high rates of needle sharing, elevated HIV prevalence, and limited access to HIV testing and treatment. Our team has successfully used respondent-driven sampling (RDS) to leverage social networks and reach HIV-positive PWID who are unaware of their status or disconnected from care. Building on this, the project proposes to assess three scalable strategies aimed at improving the "treat and retain" stages of the HIV care continuum for PWID.

In a factorial randomized controlled trial (RCT), we will evaluate the effects of:

- Same-day ART initiation for timely treatment.
- Community-based HIV care tailored for PWID.
- Psychosocial/navigation support to enhance treatment adherence.

Principal Investigator: Sunil Solomon
Duration: September 2020 - May 2026
Location: Northern and Central regions of India

This trial design allows us to test individual and combined effects of these interventions to improve survival with viral suppression among PWID, while also analyzing how these strategies interact to optimize outcomes.

Molecular Networks and Deep Learning for Targeted HIV Interventions among PWID

Reaching the targets to end AIDS by 2030 requires addressing the populations with the highest HIV burden, such as people who inject drugs (PWID). Injection drug use has increasingly contributed to new HIV infections, LMICs, and is further complicated by the rise of opioid use in some regions, including the United States. PWID face some of the most explosive HIV epidemics globally, and combating this requires multifaceted approaches that go beyond individual-level factors. Social and structural determinants, including social and spatial networks, play a significant role in HIV transmission, yet there are limited tools to effectively capture and analyze network data. This study seeks to leverage a unique set of longitudinal social, spatial, and viral data collected from over 2,500 PWID in New Delhi, India (2016-2021). By applying machine learning and viral phylogenetics, the study aims to address the challenges of network enumeration and provide new insights into epidemic dynamics, evaluating intervention strategies that could disrupt HIV transmission at a community level.

Principal Investigator: Steven Clipman

Duration: April 2022 - March 2026

Location: New Delhi

This study will enhance understanding of HIV transmission dynamics by utilizing network science to inform more effective and cost-efficient intervention strategies for PWID. By developing network models and exploring machine learning and viral phylogenetics, it offers a novel approach to monitoring epidemics and optimizing resource allocation, which could significantly improve HIV prevention efforts in urban areas with high PWID populations like New Delhi.

Program ACCELERATE

The ACCELERATE program, a five-year initiative supported by USAID and PEPFAR under the leadership of the National AIDS Control Organization and State AIDS Prevention and Control Societies, aims to strengthen HIV prevention and treatment services.

The program focuses on delivering comprehensive care to vulnerable populations, including people living with HIV, key populations, their partners, and orphans. Since 2019, ACCELERATE has successfully met most PEPFAR/USAID benchmarks, implementing innovative models such as India's first Pre-Exposure Prophylaxis (PrEP) and HIV self-testing through the SafeZindagi online platform, which has expanded access to previously unreached populations. The program also established Mitr clinics for the transgender community and Adolescent Friendly Health Centers (AFHC) to enhance care for key populations, all guided by evidence-based best practices.

Principal Investigator: Sunil Solomon

Duration: 2019 to present

Location: Maharashtra, Telangana, Andhra Pradesh, Manipur, Mizoram, Nagaland

Sponsor/Donor(s): PEPFAR/USAID

Partners: YR Gaitonde Center for AIDS Research and Education, National AIDS Control Organization, The Fenway Institute, Blue Lotus Advisory

Related Publications:

- 1. HIV self-testing in India: Implementation and qualitative evaluation of a web-based programme with virtual counsellor support <<https://onlinelibrary.wiley.com/doi/10.1002/jia2.26302>>
- 2. COVID-19 impact on index testing services and programmatic cost in 5 high HIV prevalence Indian districts <<https://pubmed.ncbi.nlm.nih.gov/36482363/>>
- 3. India's adaptation of HIV services to ensure continuity of service delivery during the COVID-19 pandemic <<https://onlinelibrary.wiley.com/doi/full/10.1002/jia2.25964>>
- 4. HIV service delivery in the time of COVID-19: Focus group discussions with key populations in India <<https://onlinelibrary.wiley.com/doi/full/10.1002/jia2.25800>>

The ACCELERATE program has made significant strides in HIV prevention and care, pioneering models like PrEP and HIV self-testing in India. It has successfully mobilized resources, met cost-share requirements, and contributed to the National ART Guidelines 2022. During COVID-19, the program adapted HIV services to ensure uninterrupted care, and its initiatives continue to shape HIV service delivery in India.

MALARIA

Center for the Study of Complex Malaria in India (CSCMI)

Principal Investigator: Jane Carlton

Duration: 2010 to present

Location: Odisha, Tamil Nadu, Gujarat, Meghalaya, Madhya Pradesh

Sponsor/Donor(s): National Institutes of Health (U.S.)

Partners: New York University; National Institute of Malaria Research, New Delhi; National Institute of Malaria Research, Nadiad (Gujarat); National Institute of Research in Tribal Health/ICMR Jabalpur (Madhya Pradesh); National Institute of Malaria Research, Chennai (Tamil Nadu); Indian Institute of Public Health, Shillong (Meghalaya); Ispat General Hospital Community Welfare Society Hospital National Institute of Malaria Research Field Unit, Rourkela (Odisha)

The Center for the Study of Complex Malaria in India (CSCMI) is focused on understanding how "complex malaria" influences the epidemiology, transmission, and outcome of the disease in India. The project includes epidemiological studies, vector studies, genomics projects, clinical trials, social and behavioral studies, and an effectiveness trial to assess malaria camps in Odisha. The studies are conducted across multiple field sites in India, including Rourkela (Odisha), Chennai (Tamil Nadu), Nadiad (Gujarat), West Khasi Hills and Jaintai Hills (Meghalaya), and Jabalpur (Madhya Pradesh).

The project develops the knowledge, tools, and evidence-based strategies necessary to support malaria intervention and control programs in India. Key findings include the high burden of asymptomatic and submicroscopic malaria infections, the need for continued surveillance of mosquito habitats and behaviors, the effectiveness of Odisha State "Malaria Camps," and uncovering the mechanisms of brain swelling in cerebral malaria patients.

INTERNATIONAL RELATIONS

India's Trade Agreements

Principal Investigator: Pravin Krishna

Project Description: Analysis of India's Free Trade Agreements

Duration: January 2022-025

Sponsor / Donor(s): Johns Hopkins School of Advanced International Studies

Current or potential impact: Central to design trade negotiations

Demonetization and Form Exports

Principal Investigator: Pravin Krishna

Other faculty member(s) involved: Ryan Kim, RTitam Chaurey

Project Description: Analysis of Firm level responses to demonetization

Duration: January 2022-25

Sponsor / Donor(s): Johns Hopkins School of Advanced International Studies

Current or potential impact: Understanding of supply chain resiliency