INDIAN INSTITUTE of PUBLIC HEALTH
SHILLONG
ESTABLISHED BY GOVT. OF MEGHALAYA AND PHFI

Working towards a healthier
North East India

Annual Report
2020-2021

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1. Introduction

1.1. About IIPH-Shillong

The Indian Institute of Public Health Shillong (IIPH-S) was established in collaboration with the Government of Meghalaya by the PHFI as a regional public health institute for the northeast region of India. IIPH-S is intended to redress the limited institutional and systems capacity in public health in the North East Region of India. The North East region of India consists of 8 states together bordered by Nepal, Bhutan, China, Myanmar and Bangladesh. It is largely populated by indigenous (tribal) people, with over 200 scheduled tribes.

On Aug 15, 2020 the founding members of the Board of Governors signed the MoU to establish a Society. On 19, 2020, the IIPH-Shillong Society was registered under the Meghalaya Societies Registration Act XII of 1983 with its objective to promote health and wellbeing in all communities including tribal peoples and the weaker sections of society, establish, develop and maintain teaching and research Institute/s including a University. So as to promote research, education, capacity building and cost-effective health delivery systems, in the northeast region. The affairs of the society is overseen by the Governing Body comprising the Principal Secretary, Health and Family Welfare Government of Meghalaya, President of PHFI, Director of IIPH-Shillong, and public health specialists from Meghalaya and other academic institutions from the North-East India.

Public health challenges in the northeast region are myriad and often require varied approaches taking into account differences in ethnicities, culture, food and lifestyle as compared to the other parts of India. The region is largely under-developed with many areas having poor health indices and poses considerable challenges for state health systems. There is a scarcity of public health training facilities in the region. Institutional mechanisms that evaluate programmes and policies to provide an evidence base for appropriate contextualisation is also limited. In the northeast region, currently there is no institution for public health education and candidates have to travel elsewhere to gain degrees in public health. Hence the need for a northeast regional IIPH continues to remain relevant.

1.2. Infrastructure

The Government of Meghalaya has provided interim premises in Lawmali, Shillong from which IIPH-S is functioning. Initially our research activities were started through a small one room research cell in 2012, activities increased in 2015 with provision of additional space. In 2021 a notice has been issued to providing more space (the old NIFT campus) available to IIPH Shillong (see annexure 1).

2. Faculty at IIPH Shillong

2.1. Core faculty

Prof. Sandra Albert is a dermatologist and a public health professional, and currently the Director of the Indian Institute of Public Health (IIPH) in Shillong, in northeast India. She has an MD in Skin & Sexually Transmitted Infections from the Kasturba Medical College, Manipal, India. From clinical medicine she broadened her field of interest to public health and received a Doctor of Public Health (DrPH) from the London School of Hygiene & Tropical Medicine, UK in 2014. Her research interests include health systems, health policy, skin disorders, sexual and reproductive health, malaria epidemiology, health economics and indigenous knowledge.
Email: sandra.albert@phfi.org

Dr. Rajiv Sarkar is an Associate Professor at the Indian Institute of Public Health, Shillong. He has M.Sc. and Ph.D. degrees in epidemiology from Christian Medical College, Vellore with 10+ years of academic and industry experience in the design, conduct and analysis of a wide range of epidemiological studies – outbreak investigations, cross-sectional surveys, case-control studies, longitudinal cohorts, and clinical trials (both individual and cluster-randomised) and real-world studies. He has co-authored 80+ peer-reviewed publications in national and international journals. In 2013, he received an Early Career Fellowship from the DBT/ Wellcome Trust India Alliance, being the first public health researcher to receive the prestigious fellowship. He was recognised as an Emerging Leader in International Infectious Diseases by the International Society for Infectious Diseases in 2016. He is an Associate Editor of Epidemiology and Infection journal and an Editorial Board member of the Journal of Public Health Policy.
Email: rajiv.sarkar@phfi.org

Dr. Eliza K Dutta is an Assistant Professor and an India Alliance DBT/Wellcome Trust Early Career Fellow in Clinical research & Public Health, at the Indian Institute of Public Health Shillong. She has a PhD in Health Sciences (Epidemiology) from the University of Pune, with more than 10+ years of total experience in public health research including Global Burden of Diseases project, and other national and international projects on cancers, liver diseases and tuberculosis. Her research interests include cancer epidemiology and genetics, women health beyond reproductive needs, health economics and ethics in research. She is also a contributor to the ongoing Lancet Citizen's Commission on reimagining India's health systems
Email: eliza.dutta@phfi.org

Dr. Melissa Glenda Lewis is a Biostatistician and currently the Assistant Professor at the Indian Institute of Public Health Shillong (IIPHS) in northeast India. Prior to this, she served as a Senior Lecturer for four years at the sister organization (Indian Institute of Public Health Hyderabad (IIPHH). She has Masters in Biostatistics and Ph.D. (Biostatistics) in integrating the effects sizes from various study designs using Bayesian approach to Meta-analysis in public health systematic reviews of interventions from the Department of Statistics, Manipal Academy of Higher Education (MAHE), Manipal, Karnataka, India. She has authored/co-authored 25 research publications, is a recipient of Prof. KR Sundaram young research scholar award, Prof. Girijakant Shukla – IBS (IR) Young Biometrician award and beneficiary of Cochrane Anne Anderson Award. At IIPHS, she teaches Biostatistics and Data management to students of the master's in public health and uses her core areas (statistical modeling, Bayesian methods, Systematic reviews, and meta-analysis) of interest in academic writing and teaching.
Email:melissa.glenda1@gmail.com

Dr. Tiameren Jamir is a deputy director of the Regional Resource Hub, Health Technology Assessment in India (RRH-HTAIn) at the Indian Institute of Public Health Shillong. He is also a Visiting Faculty at the Department of Allied Health Sciences, Martin Luther Christian University (MLCU). He has an MBBS degree from Guwahati Medical College & Hospital and an MBA in Hospital & Health System Management from Birla Institute of Technology and Science, Pilani (BITS Pilani), Hyderabad. He has more than 15 years of experience in the Medical and Health field with interest in Emergency Medicine focused on Pre-Hospital care and Systems research.
Email: tiamerenj15@gmail.com

Dr. Barilin Dkhar is a Scientist-C in an ICMR-NCDIR funded project on Cancer at the Indian Institute of Public Health Shillong. She holds a Master's degree in Bio-Technology and a PhD degree in Zoology (Biological chemistry) from NEHU Shillong with a post-doctoral experience as a DBT-Research Associateship awardee (2018). She has contributed to scientific research through her work on Cochlea implants, Diabetes, Parasitology, Protein expression and purification. Her research interests include Medical Biochemistry, Enzymology, Natural products, Medicinal plants, and Cancer epidemiology.
Email:barilindkhar@gmail.com

Bindya Sara Babu is a Research Fellow at the Indian Institute of Public Health, Shillong in the Regional Resource Hub- Health Technology Assessment, India (RRH-HTAIn). She has an M.A., M.Phil. in economics from the University of Madras, Chennai, Tamil Nadu. During her tenure she worked with IIT-Madras and WTO, Delhi. Her research interests include macroeconomics, growth and development, economics of social sector and public economics.

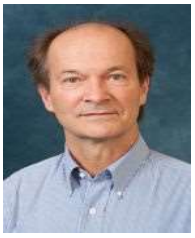
Email: bindiya.babu94@gmail.com

Uniqueky Gratis Mawrie is a future faculty of IIPHS. She is currently pursuing a Research Degree at the London School of Hygiene and Tropical Medicine, UK. Her PhD work involves applying the One Health Approach, to explore the role of animals and environment in the transmission and sustenance of soil transmitted helminths in humans. She has a MPH degree from Sree Chitra Tirunal Institute of Medical Sciences, Trivandrum and a BSc Nursing degree from CMC, Vellore. She brings both clinical and public health experience.

2.2. Adjunct Faculty

Emeritus Professor Richard Heller, University of Manchester, UK, and University of Newcastle, Australia. Medical degree and doctorate from the University of London. Previously, professor of Clinical Epidemiology and Community Medicine and Director of The Centre for Clinical Epidemiology and Biostatistics at the University of Newcastle and consultant general physician at the John Hunter Hospital. Professor of Public Health in the University of Manchester, UK till 2006. Prof Heller was involved with the International Clinical Epidemiology Network, for capacity building in medical schools across the developing world. As part of that, developed a distance learning masters course in the University of Newcastle. Founder and coordinator of the Peoples-uni (http://peoples-uni.org) which aimed to provide Public Health capacity building in developing countries at low cost. Research interests include causes and prevention of heart disease, the implementation of Evidence Based Practice, and developing measures to describe the population impact of disease risks and the benefits of interventions. Around 400 publications in the peer reviewed literature.

Dr. Laura Downey is a Senior Research Fellow at the George Institute for Global Health, Imperial College London. Previously, she was a technical advisor in global health in the Global Health and Development Group at Imperial, and a core member of the International Decision Support Initiative (iDSI)– an international collaborative platform that assists governments in low- and middle-income countries (LMICs) to use evidence to improve the value for money of healthcare investment. Dr Downey has been closely involved in numerous health system reforms in India between 2015 and 2020 and remains a health policy mentor for the Indian Council of Medical Research. She has worked with country partners across Asia, Africa, and Europe in partnership with global institutions such as the World Health Organisation (WHO), and the World Bank. Dr Downey has over 60 peer-reviewed publications and continues to actively contribute to research in health economics, particularly in relation to healthcare investment and priority-setting in LMICs. She has held research and policy positions at the National Institute of Health and Care Excellence (NICE), University College London (UCL), and the University of New South Wales, Australia.



Prof. Mark L. Wilson is an epidemiologist and population ecologist with broad research interests in infectious diseases, including the analysis of transmission dynamics, the evolution of vector-host-parasite systems, and the determinants of human risk. During the past four decades, most research projects have aimed to improve understanding of the social, environmental and behavioral drivers of exposure, infection, and disease, especially among underserved people. Efforts have been made to critically develop efficient study designs, thoughtful statistical analysis, and appropriate inferences. More recently, I have become engaged in applied research projects, including evaluating the effectiveness of interventions, and the role of social and economic barriers to their adoption. Some projects include mixed methods approaches to assess knowledge and identify behaviors related to implementation of risk reduction measures.

Dr. Nanda Kishore is an anthropologist by training with over 20 years of experience in development sector and academia. He has a PhD in Medical Anthropology and Cultural Psychiatry, University College London, UK and MPhil in Medical Anthropology, University of Hyderabad, Telangana. He also has a MA in Anthropology from the University of Hyderabad, Telangana. He worked for national and international development organizations before shifting to Indian Institute of Public Health Hyderabad, Public Health Foundation of India in 2009. Nandu is inspired by the philosophy of pragmatism and methods of ethnography and do research on contemporary social issues. He is concerned with attempts by persons and societies to secure well-being in the context of contradictions and uncertainties. Some research fields he is interested to work are: Socio-Cultural and Ecological factors of Health and Wellbeing, Mental Health, Health Policy and Health systems research, Tribal Health, Ethnography of health and health care, Technology for health, Applied Medical Anthropology,

Health equity, Community based participatory research approaches, Human centered design, One Health and Citizen Science.
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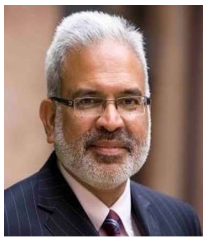
Dr. Kranti Suresh Vora is MD (ObGyn) from Gujarat University, MPH from Johns Hopkins School of Public Health, USA and PhD from University of Maryland, USA. Dr Vora started her public health career as a consultant in SEWA, Ahmedabad and has worked as a faculty at IIPH, Gandhinagar since October 2012. She has managed projects in maternal health area with international partners such as Karolinska Institutet, Sweden and University of Aberdeen, UK and Unicef Afghanistan. Dr Vora has developed demographic surveillance sites to gather evidence for improving MCH in India. She has worked in tribal areas to establish a cohort of mothers to examine impact of maternal infections and stress on birth outcomes and early childhood. Vora has published more than 50 peer reviewed publications to improve RCH in Asian countries. Dr Vora has written papers on Covid-19 including on vaccine development, vaccine hesitancy and vaccine advancement for women, children, and elderly.



Prof. Rajan Madhok, MB BS MSc FRCS FFPHA medical graduate from Delhi, India he went to the UK in 1980 where over the years he held increasingly senior leadership positions as director of public health and medical director in various places in England. Throughout his career he has actively supported and led educational developments in academic and managerial roles. He is committed to global and public health, capacity building and leadership development with a focus on human rights, ethics and professionalism. He is keen to promote global learning and reflective practice – further details of his work are at www.ramareflections.com

Prof. Anura Viswanath Kurpad is a doctor, physiologist, and nutritionist, working at St John's Medical College, Bengaluru, where he is currently Professor of Physiology. He received his MBBS and MD from St John's Medical College, and PhD from Bangalore University in 1992. He was a postdoctoral Fellow at Cambridge University, UK, as well as a visiting Scientist at MIT, Cambridge, USA. He has published over 480 papers and has a H-index of 65 with over 24000 citations. In 2020, he was one of 3 Indian scientists in the top 2% of nutrition scientists worldwide in the Stanford list. He is co-author of the popular Guyton's Textbook of Physiology (Asian Edition), which is now in its 3rd Edition, as well as a book on Nutrition and Diabetes. He serves as Associate Editor of the American Journal of Clinical Nutrition and Co-Editor of the Asia Pacific Journal of Clinical Nutrition. He is a Fellow of the Royal College of Physicians (London), Fellow of the National Academy of Medical Sciences and Fellow of the International Union of Nutritional Sciences. In 2015, he received the prestigious Margdarshi Fellowship of the Wellcome Trust/DBT India Alliance.

His interests are in human, clinical and public health aspects of nutrition, applied throughout the lifecycle. In terms of specific nutrients, his interests are in the physiology and clinical aspects of human energy, protein and micronutrient (iron, vitamin A, B vitamins, calcium) metabolism. Professor Kurpad works closely with international and national policy and advisories. Beyond his work at the WHO, FAO and IAEA, he was the Chair of the Scientific Advisory Group of the Nutrition Division of the ICMR for the last 3 years, as well as Chair of the ICMR Expert Committee on Nutrient Requirement of Indians. He is also Chair of the Ministry of Health & Family Welfare's (MoHFW) Vitamin A policy subgroup. He was the Chair of the Scientific Advisory Committee of the National Institute of Nutrition (NIN). He is a member of the NitiAyog's National Technical Board of Nutrition and the apex Scientific Committee of the Food Safety and Standards Authority of India (FSSAI). He is also a member of the Governing Body of the National Agri-Biotechnology Institute, Punjab.

Dr. Aritra Das is a medical doctor (MBBS from Calcutta University) with MS and PhD in Epidemiology from the School of Public Health, University of California – Los Angeles (UCLA), with more than 14 years of professional experience in various public health domains in India. He was awarded the NIH/Fogarty AIDS International Training and Research Program scholarship for pursuing graduate and doctoral studies on HIV epidemiology. His research interests lie in Maternal, Neonatal and Child Health, Infectious diseases (HIV and Visceral Leishmaniasis) and Public Health Implementation Research. He has co-authored 42 articles (15 as the first author) in peer-reviewed international journals.

His areas of work include, inter alia, conceptualizing and designing large observational studies and disseminating the findings with stakeholders such as donors, the provincial and the national Government. As the Consultant Epidemiologist of the Concurrent Measurement and Learning unit of the Bihar Technical Support Program, his current key responsibilities involve conceptualizing program evaluation designs and relevant scientifically valid studies, leading the overall analysis of data collected in various studies and identification of pertinent findings. Besides, he is responsible for managing the team of State and Regional M&E specialists and leading the technical and analytical capacity-building activities of the group of Regional and District-level M&E team members. Another essential duty is to lead the data-related interactions with the donors (Bill and Melinda Gates Foundation) and disseminating the results and their programmatic implications with various stakeholders.

Regarding his past experiences, he has worked with the Real-World Evidence division of a large CRO, where he was involved in the protocol writing, analysis plan preparation and study report writing for various pharmaceutical clients. He is proficient in using SASTM for data management, exploration, and analytical exercises, including advanced regression modelling.

Dr. V Selvaraju, PhD, is an Economist with substantial work experience in health financing and policy. Over the past three decades he worked in various capacities at Imperial College UK, CordAid The Netherlands, World Health Organisation, World Bank, Abt Associates USA and other prominent development agencies as well as governments in India, Indonesia, Bhutan and Afghanistan. His primary areas of work include, health insurance, health expenditure analysis, cost analysis, national health accounts, and performance-based financing, etc. He has published his research in peer-reviewed journals and books. He was invited on several occasions to contribute background papers for reports on health policy making in India. He served as member of technical advisory groups and independent evaluation groups on health. Selvaraju is one of the founders of Indian Health Economics and Policy Association and served as its Founder Secretary until 2016.

Dr. Suveera Prasad is a Consultant Psychiatrist in General Adult, working in UK for last 18 years as a consultant. Prasad has done medical training in Kerala and Post graduate training in Psychiatry in NIMHANS, Bangalore, India. After her Post Graduation in Psychiatry, she worked in the De-addiction Centre in NIMHANS and completed her thesis for DNB Psychiatry. She worked as a Consultant in St. John's Medical College Hospital, Bangalore, India, before moving to the UK. She has done further course in medical education through Sheffield University in UK. Her areas of interest are Neuro-psychiatry, Peri-natal Psychiatry, and de-addiction/ Substance misuse.

Dr. Shaibya Saldanha started as an obstetrician gynaecologist but is steadily evolving into a sexuality activist with a strong focus on child rights. While continuing her clinical practice of 25 years, she trains stakeholders (medicos, counsellors, police, lawyers and judges, and the community at large) in setting up child protection systems in the state.

Her childhood as an army daughter has stimulated her hobbies of trekking, travelling, and learning languages. She is married to a deep-sea diver, and they have two adult children who keep her grounded.

3. Academics

3.1. MPH at IIPH-S

IIPH Shillong responded to the National Health Policy 2017 and started a full-time two-year training programme for Masters in Public Health (MPH) in 2019.The 2-year full-time MPH programme for the first batch of 15 students was formally launched by the Hon'ble Chief Minister and the Hon'ble Health Minister in 2019.

This year despite the COVID crises we were able to start online classes for the second batch of 25 students from across the northeast and also other states. Currently we are training 62 students across both batches.

3.2. Masters of Science in Biostatistics and Epidemiology (MSc BE)

The 2-year full-time Master of Science in Biostatistics and Epidemiology (MSc BE) course has been launched with the aim to prepare students in biostatistical methods for study design, data analysis, statistical reporting, data management, statistical reasoning and reporting. Graduates of the programme will be prepared for careers as biostatisticians and epidemiologists in a variety of professional environments including government, academics, healthcare, research organizations and industry.

3.3. Bachelor of Public Health (BPH)

Despite significant achievements over the past decade, public health challenges continue to prevail in India and in the world. While old threats continue to challenge health systems, new issues and challenges have appeared that burden the health systems. Creation of a dedicated Public Health Cadre has been identified as one of the important pre-requisites in moving towards improving health systems. Public health professionals help in bridging the gap between the clinical and managerial aspects of the program implementation and provide techno-managerial inputs.

Keeping this in mind, IIPH-S launched a 4-year Bachelor's degree in Public Health (BPH) course in 2021. The BPH course will attempt to prepare a competent cadre of professionals who have a basic understanding of the various aspects of public health and are able to apply this knowledge towards meeting public health challenges in the Indian context. Candidates can also opt for an integrated MPH programme that allows BPH students to earn a MPH degree in five calendar years of full-time academic study. This year, a total of 5 students have been admitted to the BPH course.

3.4. Other Training

PGD PH

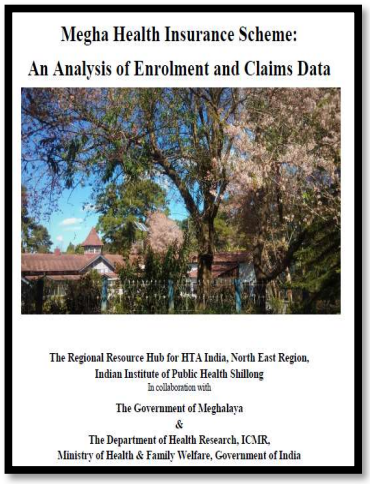
4. Research Centres/ Projects at IIPH-S

IIPH-S has been successful in generating research grants from local and international funders for research and training in the northeast region. Thematic areas of work we have undertaken include: maternal and child health (immunization), adolescent health, sexual and reproductive health, epidemiology, nutrition, cancer epidemiology and mitigation, malaria, health economics and genetics.

4.1. Regional Resource Hub (RRH) for Health Technology Assessment in India (HTAIn)

The RRH for the northeast region has been established at the Indian Institute of Public Health Shillong. HTAIn aims to evaluate the available evidences regarding cost and clinical effectiveness of health interventions that will help in reducing out of pocket expenditure and maximizing healthcare coverage. HTA is a method of synthesis that considers evidence regarding clinical effectiveness, safety, and cost-effectiveness. PI: Prof Sandra Albert, Director and Professor, IIPH-S Funded by The Department of Health Research (DHR), Ministry of Health & Family Welfare (MoHFW), Government of India.

4.1.1 Assessment of Megha Health Insurance Scheme (MHIS) in Meghalaya



Megha Health Insurance Scheme (MHIS) is a universal health insurance scheme launched in December 2012 with a primary objective to reduce household out of pocket expenditure on health. The scheme began with the financial coverage of ₹ 1, 60,000 per family for an enrolment fee of ₹ 31 in 2012, as MHIS-I. After various improvements and amendments in 2017, total insurance cover was increased to ₹ 2,80,000, along with an increase in the number of service packages eligible for insurance, under MHIS-III. The scheme currently in place is MHIS-IV which was launched in Dec-2018, with substantial improvement in coverage, both financially as well as enrolment. Despite substantial expansion of the MHIS since the scheme's inception, there is a lack of comprehensive documentation. For example, how the enrolment was carried out, how the empanelment of hospitals was completed, how insurance packages were costed, and how insurance companies were identified. Furthermore, no formal analysis has ever been carried out to analyse the patterns of utilisation of the scheme and how this reflects the general health of the population in the state of Meghalaya.

An analysis of the enrolment and claims data of the Megha Health Insurance Scheme (MHIS) was conducted by the Indian Institute of Public Health-Shillong in collaboration with the Directorate of Health Service, Government of Meghalaya, India, and the Imperial College

London, UK. Six years of medical insurance enrolment and claims data (2013 – 2018) covering three iterations of the MHIS scheme were analysed. De-identified data files included age, sex, district of residence, the district of the hospital providing care, type of hospital, date of enrolment, status at discharge, procedure categories, package codes and names, cost of package, and amount claimed.

Key Findings:

1. From MHIS-I through MHIS-III, there was a consistent increase in enrolment and the pattern of enrolment remained stable across districts, gender, age group and occupation categories. Enrolment was equal amongst both males and females in all three phases of MHIS (Enrolment data disaggregated by age groups showed that highest enrolment was in the age group 19-45 years in all three phases followed by 6-18 years.
2. The highest volume of claims both in terms of number claimed and amount, were for services availed in private hospitals in the state, with non-private sector service providers empanelled under MHIS-III delivered approximately 43% of all care claims.
3. The top packages as indicated by volume of claims in MHIS-III included a) packages listed under 'general ward unspecified' (GWU, 42%), b) maternal packages (20.2%), c) cat/dog bite (11%), d) cataract care (1%), d) ICU care (1%), e) renal dialysis (0.9%), among others. In comparison, for MHIS-II – GWU (59%), normal deliveries and peritoneum repair (maternal packages, 10%) and malaria (3%) were the top volume claims categories. In MHIS-I, 'GWU' accrued to 65% of total number of claims, followed by 'Normal delivery' (7%), 'Normal delivery with episiotomy and peritoneal repair' (4%) under maternal care packages (16.9%) and 'General ward -ICU' (4%). Cataract care contributed to 1% of total claims. Cat/dog bite category was not included in MHIS-I.
4. The raw number of claims for GWU doubled from MHIS I (26,892) to MHIS III (57,337), however, the number of these claims as a proportion of the total number of claims reduced from 65% to 42%. Age group 19-45 years (39%) and females (59%) were the highest claimants under this category in MHIS-III.
5. Analysis of claims data revealed that health care towards cat/dog bites contributed second highest volume of claims (11%) in MHIS-III. This included five doses of injections (INR 777 per injection) plus expenses towards dressing. Majority of claimants for cat/dog bite care availed these services from the public sector, PHC/CHCs (42%) or district hospitals (32%).

5.1.2. Assessment of PMJAY in Manipur,

PI: S Albert, Funded by DHR under RRH-HTAIn

Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) is a centrally sponsored scheme launched on 23 September 2018, under the Ayushman Bharat Mission of the Ministry of Family Health and Welfare in India. The scheme aims to reduce the financial burden on poor and vulnerable groups arising out of catastrophic hospital expenditure, while ensuring access

to quality health services. The scheme provides a coverage of INR 5,00,000 per family per year, covering ~10.74 crore families for secondary and tertiary level hospitalization. The costing study of MN-PMJAY is conducted by Indian Institute of Public Health-Shillong (IIPHS) in collaboration with the State Health Agency (SHA), Govt. of Manipur under the Department of Health Research (DHR), Ministry of Health & Family Welfare.

The study aims to assess the economic cost and rationalization of Pradhan Mantri Jan Arogya Yojana (PMJAY)-Health benefit packages (HBP's) in the public and private hospitals of Manipur. To assess the economic cost of HBP's in the PMJAY scheme, the study has the following specific objectives:

1. To assess costing of the existing packages being offered by the Govt of Manipur as part of the PMJAY currently within the context of Manipur (especially in situations of relative monopoly)
2. Propose mechanisms to check selective provision of services by the private providers (avoidance of responsibility/ cream skimming)

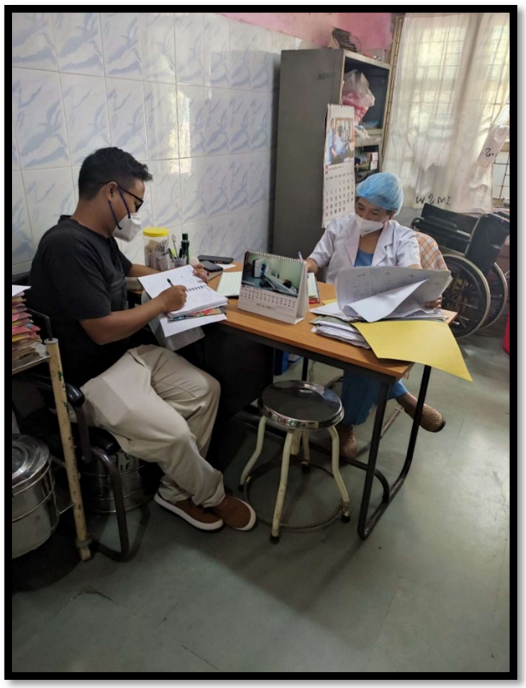
The Research teams are in the process of data collection in the participating public and private hospitals in a quest to collatequality data. The participating hospitals are Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Churachandpur-DH, Thoubal-DH, Tamenglong-DH, Shija hospital, Sky Hospital and Raj Medicity.

Stakeholder Conference at Dynasty Hall, Classic Grande, Chingmeirong, Imphal, Manipur with the Chief guest as Prof. Sandra Albert, Director, IIPH- Shillong & Regional Resource Hub–HTAIn, Smt. Mercina R Panmei (CEO, SHA Manipur), Dr Sapam Ranjan Singh (MLA and Advisor-Health to Chief Minister, Manipur), Shri Vumlunmang Vualnam, Principal Secretary (Health & Family Welfare)

Dr Sapam Ranjan Singh, MLA and Advisor-Health to Chief Minister, Manipur addressing the audience during the stakeholder meeting

Research assistants and the team of nurse at CCPUR-DH

Informal debriefing session about the MN-PMJAY costing study by Dr Jamir with Smt. Laltanpuii Vanchhong, CEO, SHA Manipur at the DHS office, Imphal



Research team in the process of retrieving the data at JNIMS

5.1.3. Thiamine deficiency and cost effectiveness analysis of thiamine supplementation.

Funded by DHT under RRH-HTA In (to be presented at the Technical Assessment Committee meeting in last quarter of 2020)

Thiamine (vitamin B1) plays an important role in processes such as synthesis of neurotransmitters and nucleic acid. Humans are dependent on dietary thiamine intake, as they cannot synthesize it. Deficiency of thiamine results to disorders such as beriberi (heart failure), which in infants could result in high case-fatality of ~100% and neurological disorders (dry beriberi). Consumption of polished rice is associated with thiamine deficiency, which is further worsened by certain cultural-dietary practices such as consumption of betel nut, fermented fish, raw river fish, ferns etc. which are all common in the North East Region (NER) of India. Data from micronutrient assessment indicted thiamine intake was lowest in the North-East Indian states such as Manipur (0.5 mg), Meghalaya (0.57 mg), Assam (0.66 mg) v/s national 1.15mg (NIN) which is alarming. The fact that there are no simple diagnostic test to detect thiamine deficiency, hence early diagnosis and prevention of potential consequences are missed - leading to morbidity and mortality. There is increasing evidence that thiamine deficiency is contributing to maternal and infant deaths in the NER. State governments in NER often rely on central policy guidelines for programmatic implementation especially when there are cost implications. Therefore, a cost-effective Analysis (CEA) Study would be useful to help strategize and implement thiamine supplementation programme in the NER to avert infantile beriberi deaths. The objective of the CEA is to determine the incremental cost effectiveness of thiamine supplementation (for 2, 4 and 6 months) as compared to standard of care among post-partum women to prevent infantile beriberi from the date of delivery. The study has a policy implication to inform policy makers regarding cost-effectiveness of thiamine supplementation over other strategies for preventing infantile beri-beri deaths in the high-risk zones. The Team is currently working on the Systematic Literature Review to assess the efficacy of thiamine supplementation in postpartum women to prevent infantile beriberi.

5.1.4. Cost effectiveness of inducing Therapeutic Hypothermia using Phase Changing Material (Mira Cradle)

to reduce Mortality and Neuro-developmental morbidity in Moderate and severe Hypoxia Ischaemic encephalopathy (HIE)

Globally 2.5 million newborn deaths occur annually contributing to ~47% of the under-5 child mortality. Birth asphyxia (BA), assumed to be related to intrapartum hypoxia- ischemia, accounts anywhere from 30 to 35 percent of neonatal deaths. In India, the reported incidence varies from 2 to 16.2% in community-based studies, with the reported case fatality rates ranging from 38.5 to 74%. Catastrophic deprivation of oxygen in the intrapartum period is thought to be directly responsible for 691,000 deaths and 1.02 million stillbirths each year, making it the fifth most common cause of childhood deaths under 5 years. For those infants that do survive, the multi-organ damage that can ensue means the risk of developing severe life-long morbidities is high. Intrapartum asphyxia results in a burden of 42 million disability years (DALYs). To put this figure in context, this is twice the DALYs imposed by diabetes. HIE occurs in about 1 – 2 per 1000 live births in developed countries and about 14 per 1000

live births in India. Phase changing material is one of the alternative low cost technologies used for cooling asphyxiated neonates. Studies have shown that inducing therapeutic hypothermia using PCM has a neuroprotective effect in new-borns with moderate HIE in neonatal units. The study aims to the perform cost-effectiveness analysis on Mira cradle device for cooling infants with HIE and the different costs related to the treatment of HIE.

5.1.5. Estimation of Cost-effectiveness Threshold (CET) for India

Increasing healthcare costs and limited resources warrant the need of evidence-based priority setting followed by efficient resource allocation. Consequently, the use of Health Technology Assessment (HTA) and economic evaluations has gained importance worldwide as a tool to guide sustainable allocation of resources. To allow for replication of the evidence generated from an economic evaluation, it is important to quantify the results in terms of benefits that will be forgone if an intervention is funded by the government. A cost-effectiveness threshold (CET) is defined as a measure of cost per unit health outcomes which are forgone, i.e., it expresses the opportunity cost of displacing any existing service/program/health technology to fund the intervention under evaluation. However, there lies an uncertainty around the estimate of CET that should be used to judge the interventions that are under evaluation. India is still striving to achieve Universal Health Coverage (UHC) for which increase in resource allocation to health is imperative. In such a scenario, where the budget for health is in its expanding phase, valuation of societal preferences or the demand-side approach may be the preferred approach for estimation of CET. Contrary to this, for the countries which have already achieved the set standards of providing comprehensive care to all, valuation of the health opportunity cost or the supply-side approach appears to be a more relevant approach. The availability of CET is thus pivotal to precisely use the evidence generated by economic evaluations. The current attempt, therefore, aims to elicit the value of the willingness to pay (WTP) for a quality-adjusted life year (QALY) to estimate the value of CET for India.

4.2. The Centre for the Study of Complex Malaria in India (CSCMI)

Funded by: National Institutes of Health, USA (through a collaborating institution NLHMB)

CSCMI is a collaborative initiative with NYU, USA, NLHMB, IIPHS and other partners. The aims of the Centre for the Study of Complex Malaria (CSCMI) are to develop the knowledge, tools, and evidence-based strategies needed to support Indian malaria intervention and control programs, and to build research capacity in India. With the aim to address the imbalance of epidemiological and transmission surveillance data for field sites in the state of Meghalaya. Community based epidemiology, entomology and molecular level studies are planned. The CSCMI lead collaborator is Prof. Jane Carlton (PI), New York University, USA along with researchers from the University of Manchester, UK and NIRTH-ICMR India.

Three major studies are currently being conducted by CSCMI in Meghalaya:

4.2.1. Epidemiology Project

Cross-sectional, longitudinal, and clinic-based epidemiology studies to describe the burden of symptomatic and asymptomatic malaria and use genome sequencing devices to identify *P. falciparum* drug resistance alleles and *P. vivax* recurrences.

1. *P. vivax cohort study*: From November 2019 till date, CSCMI had been conducted the cohort study for endemic areas under the Nartiang PHC to assess the recurrence of *P. vivax* after unsupervised treatment for up to 2 years. Consented individuals with known history of *P vivax* infection (as per NVBDCP 2018-19 report) were enrolled as study participants and blood (~200µl for all enrolled individuals and 5-10ml for positive individuals) is collected for both microscopy examination and PCR detection. Anthropometric measurements viz. mid upper arm circumference, height and weight were taken. Data on demographic information (age, gender, education, occupation), medical history (fever, episodes of malaria, antimalarial use in the past year, other complaints), travel history over the past two weeks, and use of malaria prevention methods (e.g., insecticide-treated nets (ITNs), repellents, coils) were also obtained to assess possible associated risk factors. All positive DNA samples are subjected to whole genomic sequencing to understand whether the infection is due to relapse, recurrence or recrudescence. The sequencing work is currently being conducted at NYU Center for Genomics & Systems Biology.

2. *Passive case detection at Public Health Centres (PHCs)*: All individuals presenting with malaria symptoms and referred for malaria tests are enrolled in the clinic study. Baghmara PHC, Rongara PHC, Siju PHC from South Garo Hills and Nartiang PHC from West Jaintia Hills were selected for sampling based on API relative to all other PHCs within the respective districts.

Data Collection

Anthropometric measurements

4.2.2. Entomology project

Vector studies including adult and larval surveys to characterize the prevalence and genetic diversity of different *Anopheles* species vectors, and *Anopheles* population genomics.
Adult mosquitoes are collected using CDC light traps and larvae samples using a larval dipper from study sites West Khasi Hills, West Jaintia Hills and South Garo Hills. The collected

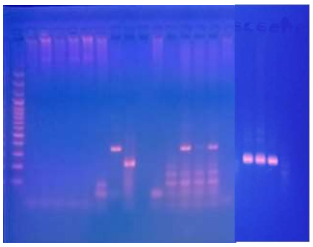
mosquitoes were morphologically identified at the genus level under a microscope in the field, and all samples collected were stored individually in beam capsules and desiccated by storage with silica gel for subsequent species identification by PCR

Adult sampling using CDC light trap

Larval Collection from rice fields and fresh water

Molecular diagnosis of *Plasmodium* and *Anopheles* species

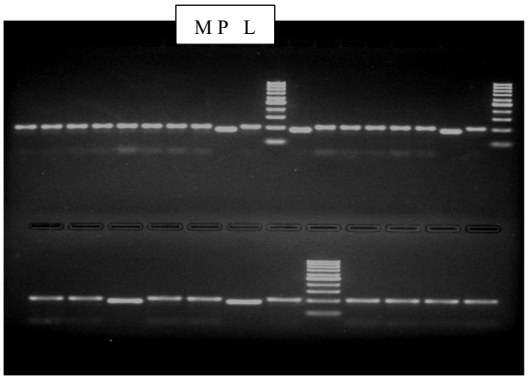
a. Parasite detection-The primary role of the laboratory team is to ensure efficient possible detection of the malaria parasite i.e., *Plasmodium vivax* and *P. falciparum* from blood samples collected by the field team. Besides microscopic detection and rapid diagnostic test, molecular assay-based detection employing species-specific multiplex Polymerase Chain Reaction (PCR) is employed for both sensitive detection and also validation of the positive immuno-chromatographic rapid test done at the field site(s).



Steps for performing polymerase chain reaction
L-R (DNA extraction-Concentration-PCR and visualization of PCR results)

b. Molecular identification of *Anopheles* species: Anopheline mosquitoes occur typically as groups of closely related species that cannot always be easily distinguishable using morphological characters only. Therefore, at CSCMI we ensure that correct identification is done by using a multiplex PCR method -to detect the species belonging to hyrcanus and maculatus groups and for all other species we use the COI sequencing method

DNA extraction from collected *Anopheles sp.*



Agarose gel electrophoresis (2%) for identification of *Anopheles sp*. under maculatus group. M=*maculatus* sp. at 180bp, P=*pseudowillmori* sp. at 203bp using L as 100 bp ladder

ABI 3730 DNA

4.2.3. Social and behavioral studies in malaria

Activities and accomplishments

Aim 1: Observe the deployment and utilization of preventive measures such as Long-Lasting Insecticidal Nets (LLINs) and Indoor Residual Spraying (IRS).

Method – non-participant observations

Work done: The team visited 80 household to make observations around bed net utilization. The team observed LLIN distribution programme in twenty-four villages (six each under Nartiang, Barato, Nonglang PHCs, four under Baghmara CHC and one under Rongara PHC) which was carried out by the State's NVBDCP. We also observed IRS application of 18 villages in Khasi, Jaintia and Garo hills.

Figure 1. Observation of IRS preparation, spraying and wall marking

Aim 2: Describe how cultural beliefs, education, and lifestyles of indigenous people affect their actions or the care they receive.

Figure 2. FGD conducted at Thangrain village, WJHs

Figure 3. FGD conducted at Tolegre village, SGHs

Method – focus group discussions and in-depth interviews
Work done: during the report period, a total of 72 FGDs of four groups comprising of young women, young men, older women and older men with 616 participants participating was done. In depth interview of 55 respondents was conducted. The individuals interviewed were doctors, nurses, lab technician, traditional healers, ANMs, GNMs, ASHAs and Anganwadi workers. All the participants' discussion was recorded after obtaining individual informed consents. The audio recordings were translated from local language to English by the ST-2 team. Data analysis is ongoing, an initial set of transcripts were coded and analysed using thematic content analysis approach. Data transcription, translation and data analysis is ongoing.

Aim 3: Map the structure of social influences within a village to identify potential behaviour change approaches that could support a malaria elimination strategy.

Method – interviews
Work done: SNA data collection was completed in ten villages (three each under Nonglang PHC, two under Nartiang PHC, one under Barato PHC, and four under Siju PHC); data entry and cleaning are completed and analysis is ongoing.


Figure 4. SNA interview at Rongrigittim village, SGHs


Figure 6. SNA interview at Jadigindam villlage, SGHs

4.3 Epidemiological risk profile of gallbladder cancer study in North, East and North-East India

Funded by: Wellcome Trust/DBT India Alliance

Gallbladder cancer (CaGB) is one of the most lethal forms of malignancy of gastro-intestinal tract with an overall survival <5 years. Salient features of this cancer include a) non-specific presentation and asymptomatic progression, and thus detection at a very late stage with poor prognosis b) unique geographical distribution with cases aggregated in certain zones such as the Ganga-Meghna-Brahmaputra (GMB) plain.

Population-based registry data from Assam (Kamrup district) report an age-standardized incidence of 16.2 per 100,000 females, only next to rates reported from Chilie and Korea. Incidence of CaGB in the north and north eastern states is ~7 times higher than the incidence in the southern states. This risk is sustained even after migration from 'high-risk' north and north-eastern zones to the 'low-risk' southern regions (OR=1.3, 95% CI 1.02-1.82) Familial Relative Risk of 3.15 with 23% heritability has also been reported from the genome-wise association studies, providing another plausible explanation of skewed distribution of CaGBs in the country. We aim to study the cumulative risk conferred by the genetic susceptibility single-nucleotide polymorphisms in the inflammatory and hepatobiliary pathways, across high-incidence regions in India, as there is still a paucity of studies with substantial epidemiological data supporting the findings.

Objectives:

1. Conduct a systematic review and meta-analysis to identify risk factors associated with GBC in high incidence areas in India
2. Determine associations between environmental, and genetic risk factors, and GBC across regions through:
   a) Exposure to pesticides and heavy metals
   b) Single Nucleotide Polymorphisms (SNPs) in inflammatory and hepatobiliary phospholipid transport pathway
3. Explore gene-environment interaction of selected SNPs and their expression across study groups

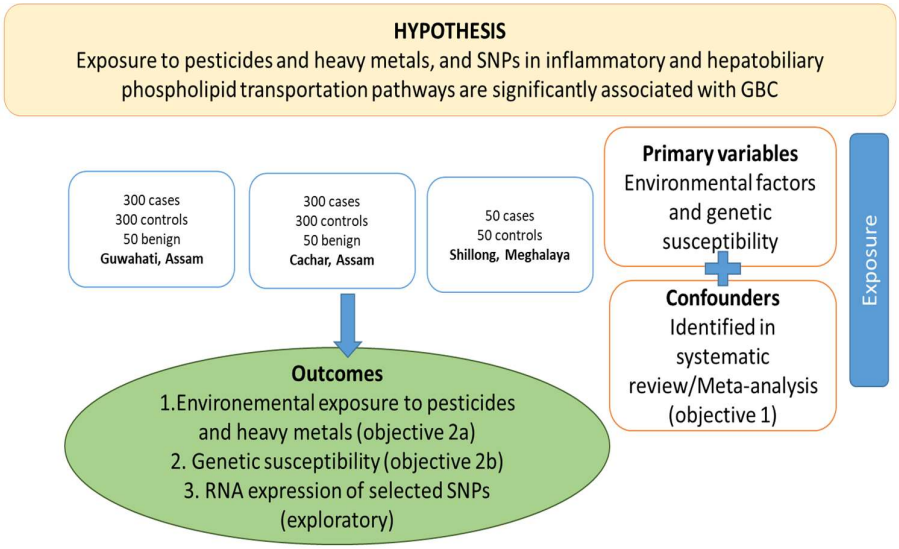
Hypothesis: Exposure to pesticides and heavy metals, and SNPs in inflammatory and hepatobiliary phospholipid transportation pathways are significantly associated with GBC

Methods:

Objective 1: Systematic review of risk factors for GBC: Although GBC is relatively rare in most parts of the world; there are hotspots that report exceptionally high incidence, including parts of India (GMB-belt, e.g. Assam). The risk profile of GBC in these regions are anticipated to be different from that in other global hotspot areas (e.g. South America, South Korea, Eastern Europe), given the socio-cultural heterogeneity of these regions

Objective 2: Association between environmental factors and genetic susceptibility: Eligible Cases and controls will be recruited to investigate association of GBC with environmental exposure (pesticide and heavy metal) and genetic susceptibility. We will also collect information on region-specific risk-factors, based on findings from the systematic review (Objective 1). Data on known risk factors such as medical history, family history, obesity, and lifestyle are already being collected in the EFGC study; based on systematic review findings, select lifestyle, reproductive, and behavioural variables will be extracted for the study participants, to be adjusted (as potential confounders) in the statistical (multivariable logistic regression) analysis.

Objective 3: Exploring gene-environment interaction for selected SNPs and environmental risk factors across the study groups. We will conduct RNA expression analysis of three most-significantly associated SNPs (pooled sample, not disaggregated by region) and explore potential gene-environment interaction in the respective pathways (inflammatory/hepatobiliary phospholipid transport) leading to GBC carcinogenesis in a sub-sample comprising 100 cases, 100 controls and 100 benign cases (patients with gallstone, gallbladder-polyps and biliary-duct obstruction), which are an intermediate in the pathway to gallbladder carcinogenesis, with ~85% of GBC cases reporting history of gallstone.



4.4. Situational Analysis and Understanding influencing factors to address delays in cancer healthcare seeking in Meghalaya

Funded by: Indian Council of Medical Research

Northeast India has the highest incidence of cancer in the country and has been witnessing an alarming rise in the number of cancer patients in recent years. Delay in healthcare seeking contributes to substantial increase in cancer morbidity and mortality. Lack of trust in the healthcare system, lack of access to healthcare services, limited early detection services and lack of knowledge of warning signs of cancer among general practitioners are some of the factors responsible for the delay in cancer care seeking. In order to prevent and control non-communicable diseases (NCDs), the National Programme for Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS) was launched in India in 2010 with a focus on health promotion, early diagnosis and screening and management of NCDs through NCD clinics, referral of cases, strengthening of infrastructure, capacity building, cost effective treatment and surveillance. However, in Meghalaya, the NPCDCS program has not been implemented uniformly throughout the state thereby contributing to the growing cancer burden

in the State. This study aims to investigate the barriers and facilitators for healthcare seeking in cancer at the individual patient and the community levels, as well as identify the programmatic gaps of the NPCDCS programme in Meghalaya.

Figure: Interviews and focus-group discussions carried by the research staff

The preliminary results highlight the major hurdles in the program implementation, which includes lack of manpower and training, lack of IEC materials and diagnostic tools for cancer awareness and screening. From the FGDs conducted with the ASHAs, it was found that the NPCDCS in Meghalaya mainly focusses on the other non-communicable diseases covered by the program and no proper training or awareness has been given to the ASHAs with regard to cancer.

The individual factors responsible for delayed health care seeking behaviour amongst cancer patients are associated with misconception about cancer and its treatment, fear and denial of cancer, attribution of symptoms to trivial conditions, and family responsibilities. Use of

traditional herbal medications and financial constraint were the most common factors associated with prolonged patient delay. Family and friends' support is found to be the major enabling factor toward seeking treatment. The community factors which are associated with delay in medical consultations were rural background, poor socio-economic status, longer distance from centre, insufficient knowledge and fear of disease and treatment. Stigma was rarely encountered as one of the causes of delayed healthcare seeking in cancer patients.

4.5. Zoonotic and Vector Borne Diseases Research & Training Centre

Funded by: DBT/Wellcome Trust India Alliance

India, and especially the north-eastern region (NER), is endemic for zoonotic and vector-borne diseases (ZVBDs) due to its unique cultural practices, predominantly non-vegetarian food habits, including consumption of bush-meat, and mixed-farming practices, which result in close contact of humans with livestock and other domestic animals, with little awareness of disease risks. The interaction of humans or livestock with wildlife exposes people and their domestic animals to sylvatic disease cycles and the risk of wildlife pathogen spill-over, which may go undetected due to the paucity of infectious diseases surveillance in the NER.

This proposed initiative by four institutes from NER: Indian Institute of Public Health-Shillong, Martin Luther Christian University, Indian Council for Agricultural Research and Nazareth Hospital, will bring together public health researchers, social scientists, laboratory microbiologists, clinicians, and disease modellers to address gaps in understanding threats posed by Zoonotic and Vector-Borne Diseases (ZVBDs) and Transboundary Animal Diseases (TADs) in northeast India.

This consortium will strengthen public-health research and training capacity by achieving the following objectives:

1. Establish and foster a ZVDB training and research centre to coordinate and strengthen research and training capacity for clinicians and public health personnel, while promoting post-graduate training (MPH/MSc/DNB/MPhil and/or PhD).
2. Characterize and evaluate risk factor patterns that facilitate transmission of regional ZVBDs by implementing population-based, clinical and epidemiological studies to identify the hidden burden of undiagnosed infections, specifically six important zoonosis (Japanese Encephalitis, Scrub Typhus, Brucellosis, Leptospirosis, Cryptosporidiosis, H1N1-swine flu).
3. Monitor and forecast disease trends to enhance early cross-species detection of ZVBD outbreaks and TAD threats through syndromic surveillance, genetic identification of pathogens and simulation modelling of transmission dynamics. Real-time monitoring and syndromic surveillance in humans will be combined with laboratory determination of genetic relatedness of isolates from human and animal specimens.

Multiple sampling design and data sources will be used to achieve the study objectives (see Figure 1), which will be conducted in 30 villages across three ecologically-different field sites with high potential for human-animal interaction.

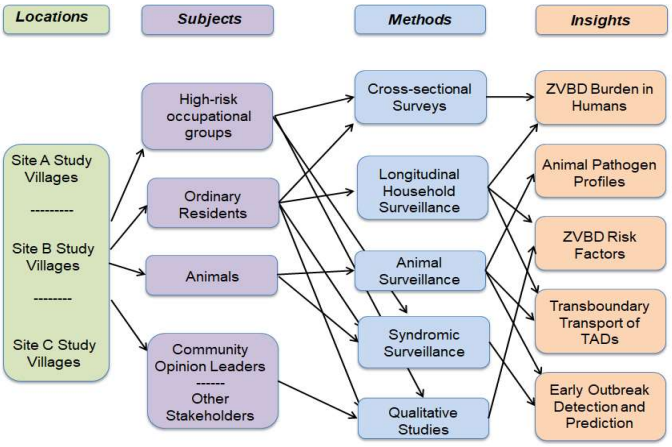


Figure 1: Study flowchart showing the subjects being studied, the methods to be employed, types of outcomes, and insights that are anticipated

A core component of this grant is to develop One-Health research capacity in the NE region, which will be achieved through the ZVBD Training and Research Centre that aims to train a trans-disciplinary team of young professionals, not only on ZVBDs, but also on research methodology and public health through long-term (doctoral/post-doctoral research, fellowships through clinical research and training programme) as well as short-term (short courses and workshops on scientific writing and proposal development, epidemiology, biostatistics and laboratory methods) trainings.
The proposed research centre will address some of the key research gaps in ZVBD epidemiology, besides enhancing the research capacity in the region. The proposed syndromic surveillance system will supplement and strengthen existing disease surveillance initiatives for ZVBDs in the NER and can be expanded to cover other infectious diseases in future.

4.6. COVID-19 related studies

4.6.1. Knowledge, Attitude & Practices towards Hand Hygiene, Respiratory Etiquette & Community Quarantine

Non-pharmacological interventions such as the use of masks, physical distancing, respiratory etiquette and hand hygiene are considered important for controlling the spread of COVID-19. Moreover, misinformation about COVID-19 can create fear, stigma, blame and panic among the people. This community-based cross-sectional survey among 416 participants residing in 14 localities of three districts of Meghalaya, India in May-June 2020 (during the nationwide COVID-19 lockdown), was conducted to assess the knowledge, perceptions, and practice towards the recommended COVID-19 preventive measures and to explore health-seeking behavior among the general population during the initial stages of the pandemic.

Participants were selected using a multi-stage sampling technique, wherein 30 dongs (from among the 14 localities) were randomly selected using computer generated random numbers, and the participating households were selected using a systematic random sampling approach. A semi-structured questionnaire was administered in person to assess the knowledge, perceptions, practice, health seeking behavior, stigma, fear, and discrimination related to COVID-19.

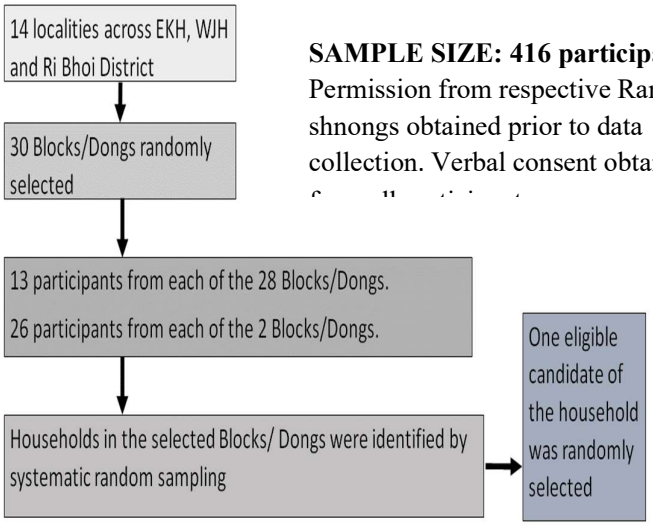


Figure 1: Flowchart of the study design

Among 416 participants, majority of them had commendable knowledge about the important signs and symptoms (94.2%) of COVID-19 and how it spreads (95.9%). There was an

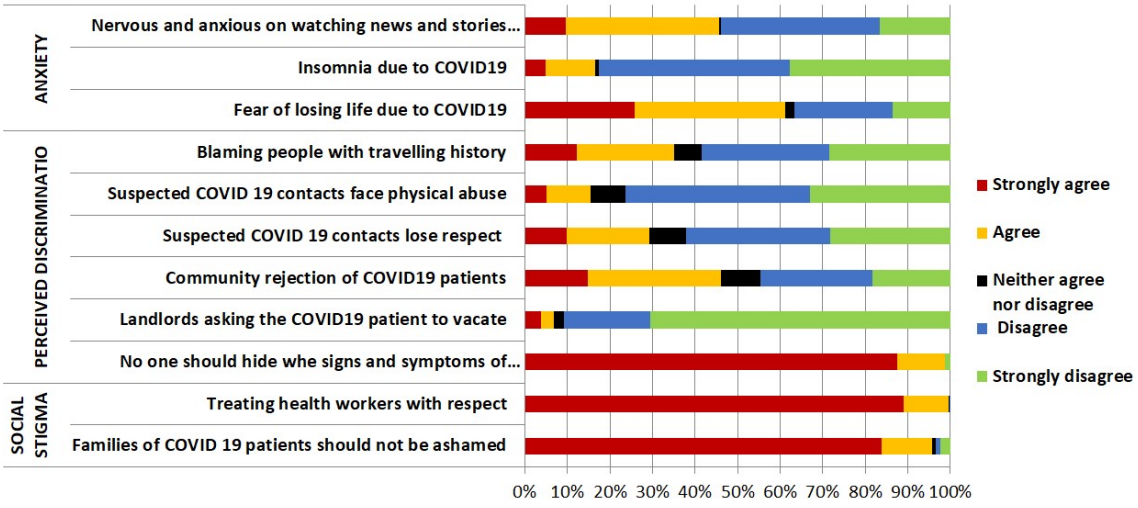


Figure 2: Reported anxiety, perceived discrimination and social stigma

increased in the frequency of hand washing (>6times/day) during COVID-19 (80.3%) than before the pandemic (40.9%). However, over 16.1% of the participants reported that if they or their family members fell sick, they would delay seeking medical care. More than three-fifths (61.3%) of the participants feared losing their life and 16.6% agreed that they could not sleep at night because they worry about getting COVID-19. More than 45% agreed that when watching news and stories about COVID-19 on social media, they become nervous and anxious

To the best of our knowledge, this was the only in-person survey conducted during the pandemic in northeast India. It provides important insight of the knowledge, perceptions,

practice, health seeking behavior, stigma, fear, and discrimination related to COVID-19 during the early phase of the pandemic, and highlights the need for a holistic approach towards pandemic control, including social and mental health interventions, in addition to clinical and public health strategies.

4.6.2. Vaccine hesitancy among health care workers and general population in Meghalaya

Figure: Key informant interviews and focus group discussions carried by the research staff

Mass uptake of the COVID-19 vaccine among the general population and health care workers (HCWs) is necessary to end the COVID 19 pandemic. No work has been done so far to understand the reasons for COVID-19 vaccine refusal in the Northeast region. Therefore, we conducted a mixed methods study with the aim of understanding the reasons for vaccine hesitancy among the general population and HCWs in Meghalaya. We adopted a mixed-methods study comprising a) cross-sectional survey of HCWs and the general population (≥45 years). To gain an in-depth understanding of the reasons, face-to-face key informant interviews and focus group discussions were conducted among the HCWs. Study participants who have not been vaccinated as of April 15, 2021, were targeted. In addition, information on unvaccinated HCWs were obtained from a sample of four hospitals of Shillong, East Khasi Hills. A stratified random sample was adopted to select the HCWs from the available list. Additionally, a PPS sampling was adopted to select the general population from localities with <40% vaccine coverage in Meghalaya.

A total of 200 HCWs and 216 general population were included for the cross-sectional survey. HCWs included were doctors/nurses 90(45%), 77 (38.5%) were non-medical frontline/support staff and 33(16.5%) were allied health professionals. The overall proportion of vaccine hesitancy among HCWs was 41.6% (871/2096). To start with the survey the study participants were given a preparatory question. We used culturally appropriate words such as '*kwai'* (betel nut) and asked them to share the first two words which they can immediately think of. These are some of the words that got frequently reported- '*khasi tradition and culture'*, '*Food'*, '*addiction'* and '*not good for health*'. In the same manner for the word COVID, the majority of HCWs reported words like '*Virus'*, '*disease'*, and '*infection'*. However, in contrast, the general population responded words like '*fear'*, '*pandemic'* and '*disease'*.

The top three reasons for refusal of the vaccine in both the population was a) not having trustworthy sources of information (greater among females), b) side effects (greater among females), and c) confusion due to conflicting messages from different sources of information (no difference among types of HCWs). In the in-depth interview conducted, the HCWs explicitly mentioned that they do not perceive the vaccine as safe. Mostly their concerns are related to the novelty of the vaccine. The post vaccination consequences were unclear to them. They stated that, conflicting messages were being circulated on various social media platforms. Two of the HCWs even stopped watching social media as the messages as they found it mentally harassing. About 38% of the general population reported that they do not like going to the hospital. To our surprise, more than one-fourth of the study population were unaware that the vaccine does not affect pregnancy or cause impotency. Some of the other reasons reported were the cost of the vaccine, influence of family members /friends /influential leaders, and distance of vaccination centre. They also reported that they perceived the infection as not so serious, thus did not consider getting vaccinated as important.

The present study helped understand the key reasons for vaccine hesitancy in Meghalaya and was used by policy-makers to come up with IEC materials to overcome the vaccine hesitancy.

4.6.3. Effectiveness of step-up treatment using the combination of anti-histamines and steroids for treatment of COVID-19

A real-world retrospective cohort study was conducted to ascertain the effectiveness of high-dose steroids and antihistamines in hospitalized COVID-19 patients with low SpO2. Deidentified data on demographic characteristics, and medical and treatment history of 271 patients admitted to a Govt. empanelled charitable sector hospital in, Shillong, Meghalaya, with a diagnosis of COVID-19 between April and June 2021, were extracted from patient medical records and analysed to ascertain the effectiveness of the step-up treatment that uses a combination of high-dose antihistamines and high-dose steroids for treatment of COVID-19 patients with low SpO2. The hospital initiated the step-up treatment on all patients who were undergoing COVID-19 treatment on or after May 25th.

The mortality rate with 95% confidence interval (95% CI) and the mean duration of hospitalization in these patients were calculated using Kaplan Meier survival curves. The effectiveness of step-up treatment was ascertained using Cox proportional hazard model, with COVID-19 related mortality as the outcome variable and step-up treatment as the primary predictor variable. The final model adjusted for age, gender, SpO2 on admission, presence of breathlessness, requirement for supplemental O2 and time from symptom onset to admission.

The mortality rate among patients on step-up treatment was 2.9 (2.1-3.9) per 100 person years, whereas for those on standard of care, the mortality rate was 5.2 (3.9-6.9) per 100 person years. The median duration of hospitalization for those on step-up treatment was 19 days, whereas for those on standard-of-care it was 13 days. Step-up treatment (HR: 0.54; 95% CI: 0.35-0.83) and higher SpO2 at admission (HR: 0.98; 95% CI: 0.97-0.99) were associated with significantly lower mortality rate. On the other hand, requirement of supplemental O2 (HR: 8.03; 95% CI: 1.96-32.90), presence of breathlessness anytime during the clinical course of the disease (HR: 2.14; 95% CI: 1.31-3.51) and age ≥60 years (HR: 2.59; 95% CI: 1.47-4.55) were associated with higher mortality rate. In the adjusted analysis, the step-up treatment conferred 43% protection (HR: 0.57; 95% CI: 0.35-0.91) from mortality in patients hospitalized with COVID-19.

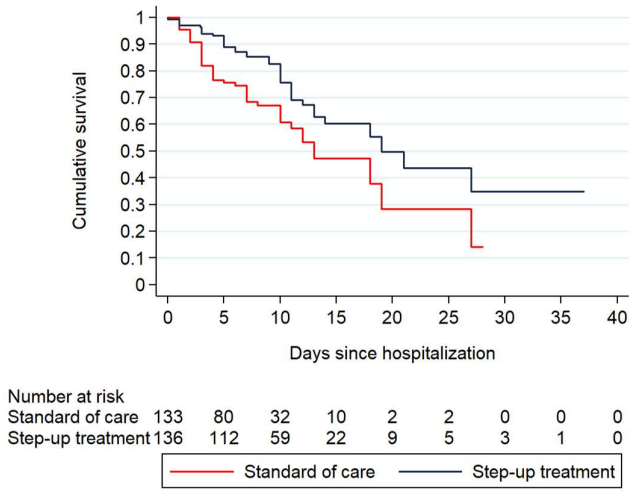


Figure: Kaplan Meier survival curve comparing step-up treatment with standard of care

Evidence from the retrospective cohort study suggests that step-up treatment may be effective in reducing the mortality of hospitalized COVID-19 patients.

4.7. **Completed projects:**

1. Exploring the reasons behind refusal of vaccines in Meghalaya- with support and funding from Directorate of Health Services (MCH&FW), Government of Meghalaya (2017-18)
2. Cost effectiveness analysis of hypothermia detecting devices, Funded by DHR under RRH-HTAIn
3. Economic evaluation of i-Stat (point of care testing device), Funded by DHR, under RRH-HTAIn
4. Impact assessment of the SALT (Stimulate, Appreciate, Learn, and Transfer) approach of community engagement to increase immunisation coverage through ownership - a mixed methods study in Assam, India (2016-18). The project was led by (PI) Prof Sandra Albert, Director and Professor, IIPH-S, Funder: International Initiative for Impact
5. A situational analysis and exploratory study of disease burden based on data from tertiary care hospitals in Shillong, Meghalaya. Funded by Government of Meghalaya (2015-2016).

6. Schools as a setting for Comprehensive Health Promotion: Preventive, Promotive, Curative, Referral and outreach services. (2015-16). Funded by WHO (grant awarded to PHFI for 3 states, IIPH Shillong undertook the northeast activities).
7. Voices for health. Public Engagement Seminar on Cancers in the Northeast (2016). Funded by Wellcome Trust.
8. Opportunities of poor urban women to engage with health policies in an indigenous context-Strengthening Evidence-based Policy. A Case Study of Shillong, Meghalaya, India. As part of the Empowerment of Women and Girls project. Collaborative work with IDS. (2014-2015). Funded by DFID.
9. Medical Pluralism among the indigenous peoples of Meghalaya, Northeast India – Implications for health policy. Funded by Wellcome Trust, UK (2012-2014).

Workshops/training/consultation conducted

1. Workshop on using Using Evidence for Decision-Making in Health Benefits Package Design, 25-26 February 2019, in collaboration with Govt of Meghalaya, International Decision Support Initiative (iDSI), Global Health and Development of Imperial College, UK & Centre for Global Development, USA
2. Consultation on Human Resources for Health with focus on Medical Specialists-ADARSH,7 December 2018, in collaboration with IIPH-Delhi
3. Workshop on qualitative research methodology, 26-29 November 2019, in collaboration with MLC University.
4. Workshop on malaria field work and research ethics. 4-14 June 2018
5. Workshop on Epidemiologic study designs, sampling techniques and sample size calculation 23-25 April 2018 – in collaboration with Nazareth Hospital and MLC University
6. Training on house listing training for end line survey on immunization in Assam (for impact assessment of community intervention SALT project). 18 June 2018. Funded by the International initiative for impact assessment
7. Training of field data collectors for end line survey data collection on immunization in Assam (for impact assessment of community intervention SALT project). 12-16 July 2018, funded by International initiative for impact assessment
8. Workshop on public health analytics and disease modelling, 2-5 May 2017, in collaboration with Indian Statistical Institute (ISI) in collaboration with Department of Anthropology, North Eastern Hill University
9. Training for doctors, allied health personnel, police on medicolegal aspects of child sexual abuse, 28 July 2016, in collaboration with Government of Meghalaya, SRC for Women and Child, and ICARE
10. Conducting baseline survey for impact assessment, 2-5 July 2016
11. Training of interviewers for baseline survey for impact assessment, 26-30 April 2016, in collaboration with PHFI
12. Public engagement seminar – voices for health. Cancers in the northeast, 26 July 2018
13. Community dissemination workshop. Empowerment of women with emphasis on sexual and reproductive health rights, 28 May 2015

14. Digital story-telling, August 2014, in collaboration with Institute of Development Studies, UK

Other training:

Training and mentorship through internship has been provided to over 15 interns from the region. In addition to this, continuous capacity building is encouraged in the institute. Till date 67 (current and new employees) of IIPHS have attended 22 different courses (overlapping) spanning topics like Decision analytic modelling for economic evaluations in HTA, Winter School in Statistical Genetics, and Integrated Bioethics Curriculum in Health Sciences Workshop by UNESCO India, Public health analytics and disease modelling, Responsible Conduct of Research for Research Administrators, Good Clinical practice etc.

Awards

1. Dr Limalemla Jamir MD – awarded by MoHFW in June 2018 for her excellence in contribution as a member of the 11th Common Review Mission to Nagaland in 2017

2. Ms Jahnabi Hazarika MPH - awarded by MoHFW in June 2018 for her excellence in contribution as a member of the 10th Common Review Mission to Tripura in 2016

6. Publications

6.1. Journal Articles

1. Ajjampur SS, Kaliappan SP, Halliday KE, Palanisamy G, Farzana J, Manuel M, Abraham D, Laxmanan S, Aruldas K, Rose A, Kennedy DS, Oswald WE, Pullan RL, Galagan SR, Ásbjörnsdóttir K, Anderson RM, Muliyil J, Sarkar R, Kang G, Walson JL. Epidemiology of soil transmitted helminths and risk analysis of hookworm infections in the community: Results from the DeWorm3 Trial in southern India. PLoS Negl Trop Dis. 2021. 15: e0009338.
2. Puthupalayam Kaliappan S, Ramanujam K, Manuel M, Farzana J, Janagaraj V, Laxmanan S, Muliyil J, Sarkar R, Kang G, Walson JL, Ajjampur SS. Soil-transmitted helminth infections after mass drug administration for lymphatic filariasis in rural southern India. Trop Med Int Health. 2021:[Epub ahead of print]
3. Kynsai Ria C. Kharkongor, Sandra Albert & Glenn Kharkongor. Presumed courtship or territorial behaviour of the White-capped Redstart *Chaimarrornis leucocephalus.* Indian Birds. 2021; Vol. 17: No. 3. https://indianbirds.in/pdfs/IB_17_3_KharkongorETAL_WhitecappedRedstart.pdf
4. Kynsai Kharkongor, Glenn CK and S Albert: Brood parasitism on Red-billed Leothrix Leiothrix lutea in Meghalaya. Indian Birds 2020; Vol. 16 No. 4; https://indianbirds.in/pdfs/IB_16_4_KharkongorETAL_RedbilledLeothrix.pdf
5. Kessler, A., Shylla, B., Singh, U. S., Lyngdoh, R., Mawkhlieng, B., van Eijk, A. M., ... & Albert, S. (2021). Spatial and temporal village-level prevalence of Plasmodium infection and associated risk factors in two districts of Meghalaya, India. Malaria Journal, 20(1), 1-17.
6. Kessler, A., van Eijk, A., Jamir, L., Walton, C., Carlton, J., & Albert, S. (2018). Malaria in Meghalaya: a systematic literature review and analysis of data from the National Vector-Borne Disease Control Programme. Malaria Journal, 17(1). doi: 10.1186/s12936-018-2563-3.
7. Pramanik, S., A. Ghosh, R. B. Nanda, M. de Rouw, P. Forth and S. Albert (2018). "Impact evaluation of a community engagement intervention in improving childhood immunization coverage: a cluster randomized controlled trial in Assam, India." *BMC Public Health* 18(1): 534
8. Sandra Albert, John Porter & Judith Green. Doktor Kot, Doktor Sla – book doctors, plant doctors and the segmentation of the medical market place in Meghalaya, northeast India. *Anthropology & Medicine Nov 2017*
9. Dandona L, Dandona R, Kumar GA, Shukla DK, Paul VK, Balakrishnan K, Prabhakaran D, Tandon N, Salvi S, Dash AP,….Albert S… et al. Nations within a nation: variations in epidemiological transition across the states of India, 1990–2016 in the Global Burden of Disease Study. *The Lancet*. 2017; 390(10111):2437-60.
10. Albert S, Porter J, Green J. *Sap* and the Traditional Healer: A Tribal (Khasi) Understanding of the Human Potential. Indian Journal of Career and Livelihood

Planning. 2015;4(1):52-61.
http://www.iaclp.org/yahoo_site_admin/assets/docs/6_Sandra_Albert.73115654.pdf
11. Albert, S. and J. Porter (2015). "Is 'mainstreaming AYUSH' the right policy for Meghalaya, northeast India?" *BMC Complementary and Alternative Medicine* 15(288). DOI 10.1186/s12906-015-0818-x PMC4539927
12. Oosterhoff P, Dkhar B, Albert S. Understanding unmet contraceptive needs among rural Khasi men and women in Meghalaya. Culture, Health & Sexuality, 2015. http://dx.doi.org/10.1080/13691058.2015.1042918
13. Albert S, Nongrum M, Webb EL, Porter JD, Kharkongor GC. *Medical pluralism among indigenous peoples in northeast India-implications for health policy.* Tropical Medicine & International Health. 2015:20(7): 952-960, doi: 10.1111/tmi.1249
14. Das T and Choubey M. Do the heterogeneous determinants of life satisfaction affect differently across borrowers of diverse credit sources? A propensity score approach. International Journal of Social Economics. 2018: 45 (8): 1142-1158
15. Das T. Does credit access lead to expansion of income and multidimensional poverty? A study of rural Assam, International Journal of Social Economics. 2018: https://doi.org/10.1108/ IJSE-12-2017-0592
16. Guha P and Das T. Inequality and Incidence of Poverty among Labourer of Tea Plantation Sector: A Study of Dibrugarh District of Assam. Journal of Economic Policy and Research. 2018: 12 (2): 43-56
17. Das T. Direction of Uneven Health Care Expenditure: Evidence from India's North East. Indian Journal of Public Health. 2017: 61 (3): 61-81
18. Sharma, D., Rohilla, L., Bagga, R., Srinivasan, R., Jindal, H.A., Sharma, N., Kankaria, A., Jamir, L., Suri, V., Singh, R.K., & Duggal, M. (2018). Feasibility of implementing cervical cancer screening program using smartphone imaging as a training aid for nurses in rural India. Public Health Nursing.2018: 1-8.
19. Shridhar K, Shrivastava A, Mitta S, Dutta E, Bumb D, Maranganty P, et al. Computer-Aided Diagnostic Tool: A Supervised Machine Learning Model for Early Detection of Oral Pre-cancer and Cancer (communicated to Cancer Prevention Research, under review).

6.2. **Book Chapters**

1. R J War, Albert S, Kharkongor GC. Shame, Sin and Guilt: The influence of Christianity on Sexuality, among Khasi Youth in Meghalaya, Northeast India. In Gender, Sexuality & Society in Northeast India. Contextual studies of tribal communities. 2021. MLCU press, Shillong India. 261-276
2. Albert S. Indigenous peoples, food, and the environment in northeast India. In: Rawlinson MC, Ward C, editors. The Routledge Handbook of Food Ethics. NY: Routledge; 2017. p. 113-24.
3. Kharkongor GC, Albert S. Career Counseling Among Indigenous Peoples. In G. Arulmani, A.J. Bakshi, A.G Watts, & F. Leong (Eds), Handbook of Career Development: International Perspectives. New York: Springer.2014: 539-554

6.3. **Reports**

1. A situational analysis and exploratory study of disease burden based on data from tertiary care hospitals in Shillong, Meghalaya 2016. Submitted to Government of Meghalaya
2. Oosterhoff P, Saprii L, Kharlyngdoh D, Albert S. When the Hen Crows: Obstacles that prevent indigenous women from influencing health-care policies – A case study of Shillong, Meghalaya, India. England: The Institute of Development Studies, Indian Institute of Public Health, & UK Aid, 2015. Available at: http://www.ids.ac.uk/publication/when-the-hen-crows-obstacles-that-prevent-indigenous-women-from-influencing-health-care-policies-a-case-study-of-shillong-meghalaya-indiahttp://interactions.eldis.org/urbanisation-and-health/country-profiles/india/digital-stories
3. Ghosh R, Pde Y, Jana I, Das T, Jain S, Chauhan A, Albert S. Cost Effectiveness Analysis of Hypothermia Detection Devices (BEMPU, ThermoSpot and Fever Watch) for Premature and Low Birth Weight Neonates in India. Indian Institute of Public Health Shillong and Department of Health Research, Ministry of Health and Family Welfare, Government of India. 2019
4. Hazarika J, Parveen S, Lyngdoh P, Albert S. Reasons behind Refusal of Vaccines in Meghalaya - report of an exploratory study. Indian Institute of Public Health Shillong and Directorate of Health & Family Welfare, Government of Meghalaya, India. 2018

7. Activities supporting Government during COVID-19 by IIPH-S team

Data analysis:

Our team extended support to the States' IDSP team in analyzing data and in assessing significance of higher numbers of fever and or respiratory infections observed in some districts in Meghalaya; calculating the sensitivity and specificity of rapid antibody test kits; and generating projections for the Covid cases in Meghalaya and comparing the disease trajectory with the other Indian states.

Mathematical modelling:

We have also developed predictive models for health system planning in collaboration with (lead by Dr Rajiv Sarkar) in collaboration with researchers from the Indian Statistical Institute and IIT Rourkee. The Dept of Health, GoM has used these figures for their Covid planning and preparations.

Research:

On the request of the Govt of Meghalaya we conducted:

7.3.1. A cross sectional study to assess knowledge, attitude and practices towards hand hygiene, respiratory etiquette and community quarantine in Meghalaya (see Section 4.6.1 for details).

7.3.2. A mixed methods study on vaccine hesitancy among health care workers and general population in Meghalaya (see Section 4.6.2 for details).

7.3.3. A retrospective data analysis of the effectiveness of step-up treatment in severe COVID-19 infections: a real-world retrospective cohort study (see Section 4.6.3 for details).

Publications on COVID-19:

A series of articles and bulletins on Covid were published in the Shillong Times newspaper (Established 1945); one of the oldest and widely read newspapers in the northeast region of India. This was done to promote general awareness, for education and as a means to reduce the general panic that was griping the populace

Membership to Expert Committees /Task force/working groups

a. Prof Sandra Albert is a member of the **Working group on Epidemiology Survey and Documentation constituted by the Interdisciplinary AYUSH Research and**

Development Task Force on Covid-19. Notification No. A.17020/1/2020-E.1 of Ministry of AYUSH

b. Dr Rajiv Sarkar, and Uniqueky Mawrie are members of the technical support group of the **State response team for COVID-19,** Government of Meghalaya

c. Prof Sandra Albert is a member of the **Medical Expert Committee** on COVID-19 constituted by the Government of Meghalaya

Public engagement activities

Articles in Newspapers:

1. Rajiv Sarkar. Medical Experts speak on inevitable third COVID wave in Meghalaya https://thenortheasttoday.com/tntvideos/features/impending-third-wave-in-meghalaya/cid3485031.htm
2. Rajiv Sarkar: Alarming rise in COVID cases: Is State prepared enough? https://theshillongtimes.com/2021/04/21/alarming-rise-in-covid-cases-is-state-prepared-enough/
3. Rajiv Sarkar. Vaccination only protection against COVID, experts say https://theshillongtimes.com/2021/04/21/vaccination-only-protection-against-covid-experts-say/
4. Sandra Albert. Novel Corona virus Covid-19 infection: A pragmatic approach http://epaper.theshillongtimes.com/epapermain.aspx?pgno=6&eddate=2020-03-19&edcode=820009
5. Sandra Albert and Dr Glenn Kharkongor. Covid-19 Bulletin http://epaper.theshillongtimes.com/epapermain.aspx?pgno=7&eddate=2020-03-19&edcode=820009
6. Sandra Albert and Glenn Kharkongor. Stages and life span of a pandemic: India and the world by http://epaper.theshillongtimes.com/epapermain.aspx?pgno=7&eddate=2020-03-20&edcode=820009
7. Sandra Albert and Glenn Kharkongor Testing for Covid-19 during stage 3 http://epaper.theshillongtimes.com/epapermain.aspx?pgno=7&eddate=2020-03-21&edcode=820009
8. Sandra Albert and Glenn Kharkongor. Vaccines and medicines for COVID-19 http://epaper.theshillongtimes.com/epapermain.aspx?pgno=10&eddate=2020-03-22&edcode=820009
9. Sandra Albert and Glenn Kharkongor. Scenarios and strategy building for Meghalaya http://epaper.theshillongtimes.com/epapermain.aspx?pgno=7&eddate=2020-03-23&edcode=820009
10. Sandra Albert and Glenn Kharkongor. Science must drive the Covid-19 decision making http://epaper.theshillongtimes.com/epapermain.aspx?pgno=7&eddate=2020-03-24&edcode=820009
11. Sandra Albert. TB remains top infectious killer worldwide http://epaper.theshillongtimes.com/epapermain.aspx?pgno=7&eddate=2020-3-26&edcode=820009

12. Sandra Albert and Glenn Kharkongor. Now is the time to prepare for the post-lockdown phase http://epaper.theshillongtimes.com/epapermain.aspx?pgno=7&eddate=2020-03-31&edcode=820009
13. Sandra Albert and Glenn Kharkongor. Meghalaya's Covid strategy is on the right track http://epaper.theshillongtimes.com/epapermain.aspx?pgno=7&eddate=2020-04-08&edcode=820009
14. Meban A Kharkongor and Sandra Albert. What about the others? Has health care for other patients been compromised http://epaper.theshillongtimes.com/epapermain.aspx?pgno=6&eddate=2020-04-30&edcode=820009
15. 'Trajectory of pandemic in state one of the lowest in India' Interview of Rajiv Sarkar and Eliza Dutta published by The Shillong Times https://theshillongtimes.com/2020/09/15/trajectory-of-pandemic-in-state-one-of-the-lowest-in-india/
16. Sandra Albert Public health and medicine – is there a difference? https://theshillongtimes.com/2020/05/14/public-health-and-medicine-is-there-a-difference/
17. Anirban Goswami. Encouraging community ownership for childhood immunization. The Sentinel April 29, 2018 https://www.sentinelassam.com/editorial/encouraging-community-ownership-for-childhood-immunization/

Newspaper articles on other public health related issues

1. Anirban Goswami. Community ownership and immunization. Eastern Chronicle April 29, 2018
2. Sandra Albert, Are medical colleges the answer for good health? Shillong Times, 16th March 2018
3. Jahnabi Hazarika and Phibansuk C. Lyngdoh. Optimal child feeding practices- need of the hour for Meghalaya. Shillong Times, 6 October 2017
4. Karter Lombi. Challenges of Hepatitis in the North East. The Arunachal Times, 28 July 2017
5. Samina Parveen. Blood Donation: The gift of Life. Shillong Times, 14 June 2017
6. Jahnabi Hazarika and Sandra Albert. Tobacco the silent killer in Meghalaya. Shillong Times, 31 May 2017
7. Anirban Goswami and. Jahnabi Hazarika. Myths about immunization hampering children's health. Shillong Times, 2 May 2017
8. Sandra Albert. State tops list of malaria cases in India. Shillong Times. April 25, 2017
9. Anirban Goswami. Encouraging community ownership for childhood immunization. The Sentinel April 29, 2018
10. S Albert. The Protection of Children from Sexual Offences (POCSO) Act. Shillong Times January 23, 2017.
11. Why are the women of Meghalaya so anaemic? Shillong Times. June 16, 2016.

Media Reports

1. Malaria study centre launched in City, by Guardian News Bureau, Monday, September 25, 2017, The Meghalaya Guardian.

Event: Stakeholder engagement and launch event, State Convention Centre, Shillong, 22nd September 2017. Organized by the Indian Institute of Public Health Shillong (IIPH) in collaboration with the Department of Health & Family Welfare, Govt. of Meghalaya

http://mg.glpublications.in/index.php?mod=1&pgnum=3&edcode=1&pagedate=2017-09-25&type

2. Meghalaya: Breakthrough in Malaria Research through Shillong's Centre for Study of Complex Malaria soon! by Reporter, Tuesday, September 24, 2017, The Northeast Today

Event: Stakeholder engagement and launch event, State Convention Centre, Shillong, 22nd September 2017. Organized by the Indian Institute of Public Health Shillong (IIPH) in collaboration with the Department of Health & Family Welfare, Govt. of Meghalaya

https://thenortheasttoday.com/meghalaya-breakthrough-in-malaria-research-through-shillongs-centre-for-study-of-complex-malaria-soon/

3. News Clip by reporter in The Shillong Times on 23 September 2016 of Samina Parveen as a speaker.

Event: Programme on Health and Personal Hygiene as part of Swachh Bharat Pakhwada at NEEPCO Corporate Office Shillong

4. East Khasi Hills among areas with highest cancer cases in country, by Reporter, Wednesday, July 27, 2016, The Shillong Times.

Event: Voice for Health: Cancer in the North East – Public engagement event, State Convention Center, Shillong, 26th July 2016. Organized by Indian Institute Public Health, Shillong and Wellcome Trust/ DBT India Alliance

5. Imbalanced diet a cause of concern in M'laya, by Reporter, Wednesday, 10 August, 2016, The Shillong Times,

Event: State level Consultation on Accelerating Progress toward Good Nutrition for All in Meghalaya Insights from the India Health Report: Nutrition 2015; State Convention Center, Shillong, 9th August 2016. Organized by Government of Meghalaya, Social Welfare Department, State Resource Centre for Women, Public Health Foundation of India (PHFI) and India Institute of Public Health Shillong (IIPH). Read more at http://www.theshillongtimes.com/2016/08/10/imbalanced-diet-a-cause-of-concern-in-mlaya/#jkXXSezk64poBjvB.99

6. Consultation programme on good nutrition held. Reporter, Guwahati, 10 August 2016, The Sentinel of this land, for its people

Event: State level Consultation on Accelerating Progress toward Good Nutrition for All in Meghalaya Insights from the India Health Report: Nutrition 2015; State Convention Center, Shillong, 9th August 2016. Organized by Government of Meghalaya, Social Welfare Department, State Resource Centre for Women, Public Health Foundation of India (PHFI) and India Institute of Public Health Shillong (IIPH). Read more at:

http://www.sentinelassam.com/meghalaya/story.php?sec=2&subsec=8&id=277324&dtP=2016-08-10&ppr=1Wednesday

7. Meghalaya among states with most number of stunted children under 5 yrs, Staff Reporter, Shillong August 9 2016, Meghalaya Times

Event: State level Consultation on Accelerating Progress toward Good Nutrition for All in Meghalaya Insights from the India Health Report: Nutrition 2015; State Convention Center, Shillong, 9th August 2016. Organized by Government of Meghalaya, Social Welfare Department, State Resource Centre for Women, Public Health Foundation of India (PHFI) and India Institute of Public Health Shillong (IIPH). Read more at: http://www.meghalayatimes.info/index.php/front-page/35491-meghalaya-among-states-with-most-number-of-stunted-children-under-5-yrs

8. State fares poorly in child nutrition, Guardian News Bureau Shillong, Aug 9 2016, The Meghalaya Guardian

Event: State level Consultation on Accelerating Progress toward Good Nutrition for All in Meghalaya Insights from the India Health Report: Nutrition 2015; State Convention Center, Shillong, 9th August 2016. Organized by Government of Meghalaya, Social Welfare Department, State Resource Centre for Women, Public Health Foundation of India (PHFI) and India Institute of Public Health Shillong (IIPH).

9. Child stunting declines in Arunachal, Itanagar, Aug 12 2016, Echo of Arunachal

Event: State level Consultation on Accelerating Progress toward Good Nutrition for All in Meghalaya Insights from the India Health Report: Nutrition 2015; State Convention Center, Shillong, 9th August 2016. Organized by Government of Meghalaya, Social Welfare Department, State Resource Centre for Women, Public Health Foundation of India (PHFI) and India Institute of Public Health Shillong (IIPH).

10. Arunachal better in feeding practices: NFHS, Shillong, 12 Aug 2016, Independent Review (Arunachal Pradesh)

Event: State level Consultation on Accelerating Progress toward Good Nutrition for All in Meghalaya Insights from the India Health Report: Nutrition 2015; State Convention Center, Shillong, 9th August 2016. Organized by Government of Meghalaya, Social Welfare Department, State Resource Centre for Women, Public Health Foundation of India (PHFI) and India Institute of Public Health Shillong (IIPH).

11. Workshop on sexual abuse held in city, by Reporter, July 29 2016, The Shillong Times

Event: Workshop on Medico - Legal aspects of Management of Sexual Assault Victims, Conference Hall, Directorate of Social Welfare, 28 July 2016. Organized by the State Resource Centre for Women (SRCW) in collaboration with the Indian Institute of Public Health (IIPH) Shillong and The Society for informed, conscious and responsible existence (ICARE). Read more at:
http://www.theshillongtimes.com/2016/07/29/workshop-on-sexual-abuse-held-in-city/#G4u7wlUkYrQ8w9ve.99

12. Sensitization on sexual abuse underlined, GUARDIAN NEWS BUREAU SHILLONG, AUG 1 2016, The Meghalaya Guardian

Event: Workshop on Medico - Legal aspects of Management of Sexual Assault Victims, Conference Hall, Directorate of Social Welfare, 28 July 2016. Organized by the State Resource Centre for Women (SRCW) in collaboration with the Indian Institute of Public Health (IIPH) Shillong and The Society for informed, conscious and responsible existence (ICARE)

13. Why are the women of Meghalaya so anaemic? by Sandra Albert, Thursday, June 16, 2016, The Shillong Times: http://www.theshillongtimes.com/2016/06/16/why-are-the-women-of-meghalaya-so-anaemic/#bv1pMSw8icQJj8l9.99
14. Meghalaya: Alternate models to address Shortage of medical specialists in the state, 25th Jan 2019, South Asia views:

Event: Final signing and handing over of MoU regarding implementation of ADARSH, between the State Government and Indian Institute of Public Health

Read more at: http://southasiaviews.com/2019/01/25/meghalaya-alternate-models-to-address-shortage-of-medical-specialists-in-the-state/

8. Conference/workshop presentations by IIPH-S Research team

8.1. Oral:

1. Kessler A, Lyngdoh P, Das A, Walton C, Carlton JM, S Albert. Malaria in Meghalaya-evidence review, decadal data and new research initiatives. The 21st International Conference on Emerging Infectious Diseases (EID) in the Pacific Rim. 26th March 01st, 2019 in Vietnam by the Ministry of Health of Viet Nam and the CMSP.
2. Kessler A, Jamir L, Lyngdoh P, Mawkhlieng B, Khongwir CN, Nongdhar J, Marbaniang PJ, Manar C, Suting E, Challam M, Siangshai W, Sangriang I, Lamin O, Kshiar A, Singh US, Shylla B, Sullivan SA, Das A, Walton C, Carlton JM, Albert S. Malaria in Meghalaya: Analysis of existing literature and state control programme data with real-time surveillance. 14th International Conference on Vectors and Vector Borne Diseases. Bhubaneswar. 9-11 January 2019.
3. Das T. Estimation of Rural Credit Demand: A Study of Lower Brahmaputra Valley Of Assam, Two Day International Conference on Interdisciplinary: Contemporary Research in Humanities, Social Sciences and Management Studies (COIN-2017), Meghalaya, 22nd July 2017.
4. Albert S. Impact assessment of the SALT (Stimulate, Appreciate, Learn, and Transfer) approach of community engagement to increase immunisation coverage through ownership - a mixed methods study in Assam, India,. 3ie workshop Delhi, 2017.
5. S Albert. Process Monitoring. 3ie learning workshop Delhi, 2017.
6. S Albert. Overview Meghalaya – its people and health systems. Washington DC 2017
7. Hazarika J, Pramanik S, Ghosh A, Parveen S and Albert S. Impact assessment of the SALT (Stimulate, Appreciate, Learn, and Transfer) approach of community engagement to increase immunisation coverage through ownership - a mixed methods study in Assam, India, Community Health in the North East by Society for Community Health Awareness Research and Action (SOCHARA) and the Fellows Collective-Northeast, Shillong Meghalaya, 19th August 2016.
8. Kharlyngdoh D, Saprii L, Oosterhoff P, and Albert S. Digital Story Telling (DST) A qualitative method for documenting lived experiences, 5th Annual Public Health Foundation of India Research Symposium, New Delhi 2015.

9. Khyriem T, Kharlyngdoh D, Saprii L and Albert S, Compilation and ICD-10 coding of patient data from a Public sector tertiary care hospital in Meghalaya, 6th Annual Public Health Foundation of India Research Symposium, New Delhi. 2016
10. Albert S. Health policy for heterogeneous populations. 5th PHFI Annual Research Symposium March12, 2015, New Delhi.
11. Albert S. Integrating different medical systems for northeast India. At regional workshop on 'Health Assurance in India: The Road Ahead' on 12th August, 2015, Bhubaneshwar, Orissa.
12. Albert S. Integrating different healthcare systems for northeast India. 2nd Annual Health Care Expansion Summit, North East Region 3rd–4th September 2015, Guwahati, Assam.
13. Albert S. Introduction to operational research. Operational Research in Public Health- Why, What, Role, Relevance. North East Zonal Operational Research Workshop NEIGRIHMS, Shillong, Meghalaya 05-06 Feb 2016.
14. Albert S. Panellist at seminar 'Trick or Treat' the future of healthcare access. Wellcome Trust, at British Council, New Delhi 22 Jan 2016.
15. Albert S. Discussant at Panel on LHT and AYUSH linkages: Epistemological and Institutional. Dialogue on Revitalization of Local Health Traditions. January 20-21, 2016, Azim Premji University, Bangalore.
16. Albert S. Public Health education and research in Northeast. Northeast health care summit. July 8-9, 2016, Guwahati, Assam.
17. Albert S. Chair public engagement seminar, Voice for Health: Cancer in the North East. Shillong, 26th July 2016. Organized by Indian Institute Public Health, Shillong and Wellcome Trust/ DBT India Alliance.
18. Das T. Session Chair- Economics, Two Day International Conference on Interdisciplinary: Contemporary Research in Humanities, Social Sciences and Management Studies (COIN-2017). 21st July 2017. Organized by Department of Humanities and Social Sciences, National Institute of Technology, Meghalaya.
19. Albert S. Workshop on rape and child sexual abuse. Chaired panel discussion on the way forward. Shillong July 27, 2016.
20. Albert S. co-facilitator workshop on Medico - Legal aspects of Management of Sexual Assault Victims, Directorate of Social Welfare, 28 July 2016. Organized by the State Resource Centre for Women (SRCW) in collaboration with the Indian Institute of Public Health (IIPH) Shillong and The Society for informed, conscious and responsible existence (ICARE).
21. Albert S. Relevance of research in the postgraduate course. DERMACON-2015: National Conference of the Indian Association of Dermatology, Venereology & Leprology (IADVL); 2015 12th-15th February; Mangalore, India.
22. Kharlyngdoh D, Saprii L, Oosterhoff P, Albert S. Engaging with state and indigenous institution – experiences and challenges of dissemination in Meghalaya. ResUp MeetUp symposium and training exchange; 2015 09th-12th February; Nairobi, Kenya.
23. Roshan Ronghang. Assessing the pattern of enrolment and claims in Megha Health Insurance Scheme (MHIS). International Seminar, Using Evidence for Decision-

Making in Health Benefits Package Design, 25th- 26th February 2019; Guwahati, Assam, India

8.2. **Posters**

1. Albert S et al. Malaria in Meghalaya- evidence review, decadal data and new research initiatives. The Gordon Research Conference on Malaria held June 30, 2019 - July 05, 2019 at Les Diablerets Conference Center in Les Diablerets, Switzerland
2. Badondor Shylla, Epidemiology of Malaria in Meghalaya, 7th Annual Public Health Foundation of India Research Symposium, New Delhi 2018
3. Phibansuk Lyngdoh. Exploring the reasons behind refusal of immunization in Meghalaya, 7th Annual Public Health Foundation of India Research Symposium, New Delhi 2018
4. Parveen S, Saprii L, Kharlyngdoh D and Albert S, (Poster) Descriptive analysis of secondary data from tertiary care hospitals in Shillong India, 6th Annual Public Health Foundation of India Research Symposium, New Delhi 2016
5. Saprii L, Oosterhoff P, Kharlyngdoh D and Albert S, Participation of Indigenous Women in Influencing Sexual and Reproductive Health Policies: A Case Study of Shillong - Meghalaya, India 5th Annual Public Health Foundation of India Research Symposium, New Delhi 2015

9. Financial Statements

9.1. Balance Sheet

INDIAN INSTITUTE OF PUBLIC HEALTH SHILLONG SOCIETY
LAWMALI : PASTEUR HILLS : SHILLONG

CONSOLIDATED BALANCE SHEET AS AT 31.03.2021

	Schedule	Current Year	Previous Year
CORPUS/CAPITAL FUND AND LIABILITIES:			
CORPUS/CAPITAL FUND	1	6043022.17	-
RESERVE AND SURPLUS	2	-	-
EARMARKED/ENDOWMENT FUNDS	3	-	-
SECURED LOANS AND BORROWINGS	4	-	-
UNSECURED LOANS AND BORROWINGS	5	-	-
DEFERRED CREDIT LIABILITIES	6	-	-
CURRENT LIABILITIES AND PROVISIONS	7	-	-
TOTAL ₹		**6043022.17**	**-**
ASSETS			
FIXED ASSETS	8	187531.00	-
INVESTMENTS - FROM EARMARKED/ENDOWMENT FUNDS	9	-	-
INVESTMENTS - Fixed Deposits with Scheduled Bank	10	-	-
CURRENT ASSETS, LOANS, ADVANCES ETC.	11	5855491.17	-
MISCELLANEOUS EXPENDITURE (To the extent not written off or adjusted)		-	-
TOTAL ₹		**6043022.17**	**-**
SIGNIFICANT ACCOUNTING POLICIES	24		
CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS	25	-	-

In terms of our report of even date
for KIRON JOSHI & ASSOCIATES
Chartered Accountants
(FRN: 313049E)

KIRON JOSHI
(Membership No. 051046)
UDIN:21051046AAAAPE3218

Place : Shillong
Date : 11.06.2021

9.2. Income and Expenditure Statement

INDIAN INSTITUTE OF PUBLIC HEALTH SHILLONG SOCIETY
LAWMALI : PASTEUR HILLS : SHILLONG

CONSOLIDATED INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31.03.2021

INCOME	Schedule	Current Year	Previous Year
Income from Sales/Services	12	-	-
Grants/Subsidies	13	9400839.00	-
Fees/Subscriptions	14	953560.00	-
Income from Investments (Income on Invest. From earmarked/endow. Funds Transferred to Funds)	15	-	-
Income from Royalty, Publication etc.	16	-	-
Interest Earned	17	4616.00	-
Other Income	18	4.00	-
Increase/(decrease) in stock of Finished goods and works-in-progress	19	-	-
TOTAL (A) ₹		**10359019.00**	**-**
EXPENDITURE:			
Establishment Expenses	20	3420013.00	-
Other Administrative Expenses etc.	21	1094559.00	-
Expenditure on Grants, Subsidies etc.	22	-	-
Bank Charges	23	1273.83	-
Depreciation	8	27928.00	-
TOTAL (B) ₹		**4543773.83**	**-**
Balance being excess of Income over Expenditure (A - B)		**5815245.17**	**-**
Transfer to Special Reserve (Specify each)		-	-
Transfer to / from General Reserve		-	-
BALANCE BEING SURPLUS/(DEFICIT) CARRIED TO CORPUS/CAPITAL FUND		**5815245.17**	**-**
SIGNIFICANT ACCOUNTING POLICIES	24		
CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS	25	-	-

for KIRON JOSHI & ASSOCIATES
Chartered Accountants
(FRN: 313048E)

KIRON JOSHI
(Membership No. 051046)
UDIN:21051046AAAAPE3218

Place : Shillong
Date : 11.06.2021

9.3. Receipts and Payment Account Statement

INDIAN INSTITUTE OF PUBLIC HEALTH SHILLONG SOCIETY
LAWMALI : PASTEUR HILLS : SHILLONG

CONSOLIDATED RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31.03.2021

Receipts	Current Year	Previous Year	Payments	Current Year	Previous Year
I. Opening Balances:			**I. Expenses:**		
a) Cash	-	-	a) Establishment Expenses	3420013.00	-
b) Bank Balances					
i) In Current Account			b) Administrative Expenses	1094559.00	-
ii) In Savings Account	-	-			
			II. Payments made against funds for various projects/seminar/ wrokshops:	-	-
II. Grant Received					
a) Department of Health Research, Ministry of Health and Family Welfare, GOI, New Delhi	4998348.00	-	**III. Investments and Deposits made:**		
b) DBT Welcome Trust, India Alliance, Hyderabad	811751.00	-	a) Out of Earmarked/Endowment Funds	-	-
c) Department of Health Research, Ministry of Health and Family Welfare, New Delhi	2746800.00	-	b) Out of Own Funds (Other Investments)	-	-
d) Indian Council of Medical Research(ICMR), Bengaluru	843940.00	-	**IV. Expenditure on Fixed Assets and Capital Work-in-Progress:**		
			a) Purchase of Fixed Assets		
III. Fees & Subscription			i. Software	20178.00	-
viii) Membership fees	1000.00	-	ii. Furniture & Fixtures	35500.00	-
ix) Fees from students	952560.00	-	iii. Books	40331.00	-
			iv. Laptop	73000.00	-
IV. Income on Investment from			v. Office Equipments	46450.00	-
a) Earmarked/Endowment Funds.	-	-			
b) Own Funds (Other Investments)	-	-	**V. Refund of Surplus money/Loan**	2039067.00	-
V. Interest Received:					
a) On Bank Deposits In Savings Account	4616.00	-	**VI. Finances Charges (Bank Charges)**	1273.83	-
b) On Loans, Advances etc.	-	-	**VII. Other Payments (specify)**		
			i. TDS paid	35325.00	-
VI. Other Income (Specify):	-	-			
Miscellanous Receipt	4.00				
			VIII. Closing Balances:		
VII. Any Other Receipts			a) Cash	-	-
i) Internal Loan refunded	-	-	b) Bank Balances		
ii) TDS Recovered	35325.00		i) In Current Account	4320416.00	-
			ii) In Savings Account	1535075.17	-
VIII. Loan from PHFI	2266844.00	-			
TOTAL ₹	12661188.00	-	TOTAL ₹	12661188.00	-

In terms of our report of even date
for KIRON JOSHI & ASSOCIATES
Chartered Accountants
(FRN: 313048E)

KIRON JOSHI & ASSOCIATES CHARTERED ACCOUNTANTS SHILLONG

KIRON HOSHI
(Membership No. 051046)
UDIN:21051046AAAAPE3218

Place : Shillong
Date : 11.06.2021

10. Annexures

10.1. Letter from GoM re old NIFT campus

GOVERNMENT OF MEGHALAYA
HEALTH & FAMILY WELFARE DEPARTMENT
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NOTIFICATION

Dated Shillong, the 2nd November, 2021.

No. Health. 231/2021/14: The Indian Institute of Public Health (IIPH) is being upgraded to begin Academic Courses for BPH (Bachelor of Public Health), in addition to MPH (Master of Public Health) and other professional public health degrees, and also to set up the State of the art 'Zoonotic Vector Borne Disease Research and Training Centre' (ZVBDC), to better prepare for future epidemics and pandemics, for which proper accommodation is urgently required.

In this regard, it is hereby notified that the old NIFT Building at Pasteur Hills, Lawmali Rd, Shillong is to be handed over to the Director, IIPH with immediate effect. They are to take over and occupy the said building without further delay.

Sd/-
(Sampath Kumar, IAS)
Principal Secretary to the Government of Meghalaya,
Health & Family Welfare Department

Memo No. Health231/2021/14-A **Dated Shillong, the 2nd November, 2021.**

Copy to:-

1. The Private Secretary to the Health Minister, Meghalaya for kind information of the Minister.
2. Private Secretary to the Chief Secretary, Government of Meghalaya for kind information of the Chief Secretary.
3. The Principal Secretary to the Government of Meghalaya, Health & Family Welfare Department, Meghalaya.
4. The Commissioner & Secretary to the Government of Meghalaya, Health & Family Welfare Department, Meghalaya.
5. The Mission Director, National Health Mission, Meghalaya, Shillong, with a request to immediately clear the storage room.
6. The Director of Health Services (MI) for immediate and necessary action.
7. The Director of Health Services (MCH&FW)/(Research), Meghalaya, Shillong.
8. The Chief Engineer, Health Engineering Wing, Meghalaya, Shillong for information.

By order, etc.,

(Dr. T. S. R. Marak)
Under Secretary to the Government of Meghalaya,
Health & Family Welfare Department
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