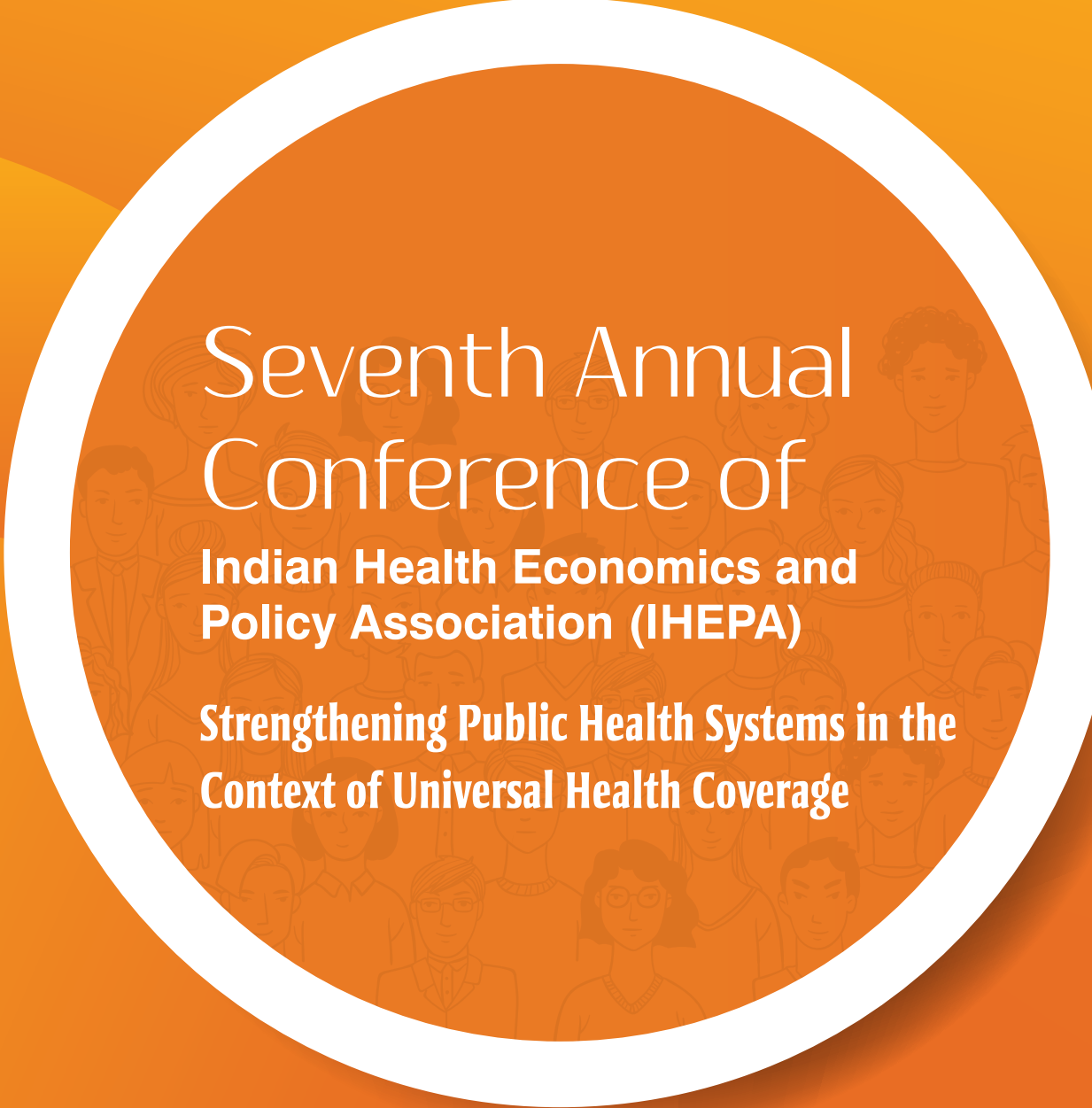




IHEPA



Seventh Annual Conference of

**Indian Health Economics and
Policy Association (IHEPA)**

**Strengthening Public Health Systems in the
Context of Universal Health Coverage**

GULATI INSTITUTE OF FINANCE AND TAXATION (GIFT), TRIVANDRUM, KERALA | 24-25 JANUARY 2019





IHEPA

GIFT GULATI INSTITUTE OF
FINANCE AND TAXATION

Seventh Annual Conference of

Indian Health Economics and Policy Association (IHEPA)

Strengthening Public Health Systems in the Context of Universal Health Coverage

Gulati Institute of Finance and Taxation (GIFT)

24-25 January 2019



BOOK OF ABSTRACTS

This collection contains abstracts accepted by Indian Health Economics and Policy Association from scholars. This collection is intended for use by the conference participants and others and will be available in the website *www.ihepa.in* too. Abstracts of past conferences too are on the website. The views presented are those of authors and IHEPA respects the views but the usual disclaimers apply.

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About IHEPA

Indian Health Economics and Policy Association (**IHEPA**) is a professional body registered under the **Societies Registration Act 1960**. The need to have a formal body which would serve as a platform for discussing and sharing intellectual ideas pertaining to the Indian health sector was strongly felt by a group of like-minded health economists and policy experts. Over a period of four years, this group discussed, met and exchanged ideas towards the formation of an Association. The IHEPA is the culmination of this process, and has been created to enable economists and other social science researchers, policymakers and practitioners to exchange, deliberate and discuss key issues and strategies in the health sector, in India as well as globally.

Vision

A vibrant and dynamic association that encourages and facilitates the exchange and sharing of knowledge, ideas and experience among researchers, policymakers and practitioners working in and on the health sector

Objectives

- To offer a platform for learning, knowledge-sharing and networking to all those interested in contributing towards a more equitable and efficient health sector.
- To bridge the gap between research and practice by bringing together researchers/ academicians and policymakers, both national and international.

IHEPA welcomes young scholars and researchers, grassroots practitioners, the private sector and community-based organizations to become part of the organization, so that all views and experiences can be heard, debated and imbibed, if found useful.

While an Indian association, IHEPA would equally like to reach out to the international community of researchers, experts, managers and policymakers, and include them in its fold to make it into truly global association.

Membership

Membership of the Association is open to all individuals and institutions engaged and interested in contributing towards evidence-based discourse and discussion relating to the health sector. Membership is in the following categories: Individual-Annual, Individual-Life, Institutional-Annual, Institutional-Life and Student.

IHEPA welcomes all to join and strengthen the association to make it a vibrant and productive body of excellence in health research and policy.

For membership application form and other details please refer below, and for any additional queries please contact secretary.ihepa@gmail.com or office.ihepa@gmail.com.

Our Collaborators

Gulati Institute of Finance and Taxation (GIFT) The Gulati Institute of Finance and Taxation (GIFT) is envisaged as a centre of excellence, specializing in research, training and consultancy, to provide fiscal and social policy inputs to the Government of Kerala in particular and the South Indian states in general. The GIFT was formed in 2009 by upgrading the Centre for Taxation Studies (CTS), an autonomous institution formed by the Government of Kerala in 1992 for undertaking research, training, consultancy, and publication in the area of public economics. For more details visit www.gift.res.in

Azim Premji University (APU): Azim Premji University was established in Karnataka by the Azim Premji University Act 2010 as a not-for-profit University and is recognized by The University Grants Commission (UGC) under Section 22F. The beginnings of the University are in the learning and experience of a decade of work in elementary education by the Azim Premji Foundation. The University was founded as one of the key responses to the constraints and challenges that the Foundation encountered both within and in the environment, and as part of a larger strategy to contribute to the Education and Development sectors in the country. More details @ <http://azimprejjiuniversity.edu.in/SitePages/index.aspx>.

International Institute for Population Sciences (IIPS) The International Institute for Population Sciences (IIPS), Mumbai, is a Deemed University under the administrative control of Ministry of Health and Family Welfare (MoHFW), Government of India. The Institute serves as a regional Institute for Training and Research in Population Studies for the ESCAP region. The Institute position itself as a centre of excellence on population and health issues through high quality scientific research and teaching. The main objective of IIPS is to train persons from India and other countries in demography and related fields and also to undertake scientific research on population issues which are of special importance to India and other countries in the ESCAP region. IIPS has also developed considerable expertise in survey research and conducts several large-scale household surveys like, NFHS, DLHS, LASI, WHO SAGE, etc in India.

United Nations Population Fund (UNFPA) is the lead UN agency for delivering a world where every pregnancy is wanted, every childbirth is safe, and every young person's potential is fulfilled. UNFPA has been assisting the Government of India since 1974 to provide family planning and health services, advance reproductive health and rights and improve maternal health. Its Eighth Country Programme of assistance (2013-17) to the Government of India focusses on young people's sexual and reproductive health and improving opportunities for vulnerable women and girls. UNFPA also supports research, advocacy and government policies and programmes to advance gender equality and reproductive rights, family planning and population dynamics. UNFPA partners with the government at the centre, other development partners at the national level, and carries out its programmes through offices in Bihar, Madhya Pradesh, Maharashtra, Odisha and Rajasthan.

Governing Council - 2018-19

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**Seventh Annual Conference of
Indian Health Economics and Policy Association
(IHEPA) on Strengthening Public Health Systems in
the Context of Universal Health Coverage**

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24-25 January 2019

Concept Note

Health Equity: Socio-economic factors that influence health of a person have been a matter of intense research in India over the last several decades. With the availability of many data sources in recent years like NFHS, NSSO and IHDS, a more nuanced understanding of health equity is possible. Health also needs to be understood not merely as death or disease but with a public health perspective. Sound analytical papers on health equity are expected under this theme with a definite contribution to the vast existing studies on this issue.

Kerala's Health System: Achievements and Challenges For the last several decades, Kerala's creditable achievements in health status have been a matter of both national and international attention. At the same time, with rapid changes in socio-economic and behavioural patterns, Kerala's health system is also facing several challenges. Under this theme, papers relating to issues that confront Kerala's health system as well as on its health achievements will be discussed.

Other Related Issues Papers on issues such as public health, nutrition, communicable and non-communicable diseases, global health relevant to the Conference themes are also discussed.

Secretary

Seventh Annual Conference of
Indian Health Economics and Policy Association (IHEPA)
**Strengthening Public Health Systems in the
Context of Universal Health Coverage**

Program Schedule

January 24, 2019	
Registration	9:00-9:30 A.M
Inaugural Session :9:30 AM -10:30 A.M Venue: Auditorium	
Welcome	Prof. D Narayana, Director GIFT & Vice President IHEPA
Remarks by President, IHEPA	Prof. Shreelata Rao Seshadri, Professor, Azim Premji University, Bangalore
Remarks by Conference President	Prof. Slim Haddad, Faculté de médecine, Université Laval, Canada
Inaugural Address	Smt. K. K. Shailaja, Hon'ble Minister for Health and Social Justice, Government of Kerala
Vote of Thanks	Prof. K S James, Director and Sr. Professor, IIPS, Mumbai & Secretary, IHEPA
Tea Break: 10:30-11:00 A.M	
Presidential Address (By the Conference President): 11.00 AM- 12.00 Noon, Venue: Auditorium	
Title: Deconstructing Universal Health Coverage	Prof. Slim Haddad

Plenary Session : 12 Noon – 1.30 PM

How did Kerala face the Challenge of Nipah Virus?

Venue : Auditorium

Moderator: Shri Rajeev Sadanandan, IAS, Additional Chief Secretary (Health)

Panel Members: Dr. Saritha R L. Director of Health Services Kerala

Dr G Arun Kumar, Manipal Centre for Virus Research; Dr.V R Rajendran, Principal, Kozhikode Government Medical College; Dr Sakeena K, District Medical Officer, Malappuram; and Dr V Jayashree, District Medical Officer, Kozhikode.

Lunch Break: 1:30 P.M. -2:30 P.M

Technical Session : I

IA : Burden of Communicable Disease

(Venue : Board Room, Ground Floor) Time : 2:30-4:00 P.M

Chairperson	Subrata Mukherjee
Discussant	Bijan J Borah
Rapporteur	
Title of the paper	Author(s)
Burden of cancer prevalence and its determinant among women in Bihar: A study based on National Family Health Survey (2015-16)	Shobit Srivastava, Himani Sharma &. Kaushalendra Kumar
Hypertension and Heart Diseases Among Adults in India : Evidence from NFHS-4	Ayantika Biswas
Cost Utility Analysis of the good glycemic status compared to the poor glycaemic status among adult diabetic subjects in north Kerala	Biju George,Rajmohanan Pillai
Overweight and Obesity among Children in India : Association with Commercial Baby food consumption	ShreyansRai
Need for Expanding Primary Care for Chronic Non-Communicable Diseases in Urban Slum Population of Chhattisgarh- Findings from a primary Survey	Sayantana Chowdhury Samir Garg, Asmita Behera, Preeti Gurung, RashmiTurkey

IB: Psychological Distress and Wellbeing (Venue : Room No : 117, Ground Floor)Time : 2:30-4:00 P.M	
Chairperson	Achin Chakraborty
Discussant	Benson Issac
Rapporteur	
Title of the paper	Author(s)
Economic Inequalities and Mental Health Problems among Elderly in India, China, Ghana, Russia, and South Africa: A Decomposition Analysis	Balhasan Ali
Mental health prevalence and health seeking behaviour in India	Ruchita B Sakpal
The impact of chronic multimorbidity, anxiety disorder and sedentary behaviour on functional disability and impairment among older adults: A community-based study	Himanshu
An Assessment of Physical Health among Older Persons: Triangulating Available Data Sets in India	AnkitAnand, Md. Ilias K Sk, TS Syamala
Prevalence of Morbidity and its association with Disability and Psychological Distress: A Descriptive study of Rural Elderly in India	Pallavi Banjare, Rinshu Dwivedi and Jalandhar Pradhan
Socio-econometric dynamic models of health status suicide in three Scandinavian countries using time series ARDL	Deb Ray and Arumugam Sankaran
IC: Marriage, Fertility and Health Implications (Venue : Room No :217, First Floor) Time : 2:30-4:00 P.M	
Chairperson	
Discussant	SrinivasGoli
Rapporteur	
Title of the paper	Author(s)
Contraceptive Use Dynamics Among Urban Poor in Three Cities Of India	Dewaram Abhiman Nagdeve

Pattern and Dynamics of Public Health in Rural Punjab: A Gender Perspective through Empirical Considerations	Baldev Singh Shergill, Kuldeep Kaur, Kamaldeep Kaur
Accessing Healthcare For LGBTQ Community In India: Is It Still an Ordeal?	Sriya Gupta, Nidhi Reddy, Khyathi Reddy
Tea Break (04:00-04:15 P.M)	
Technical Session :II	
IIA: Health Care Financing (Venue : Board Room, Ground Floor) Time : 4:15-5:45 P.M	
Chairperson	K S James
Discussant	K Selvaraju
Rapporteur	
Title of the paper	Author(s)
Poverty Impact of Out-of-Pocket Expenditure on Health Care in Rural Assam	Joel Basumatary
Trends in morbidity, out-of-pocket and catastrophic health expenditure in India, 2004-2005 to 2011-2012	JeetendraYadav, Denny John and Geetha R. Menon
Health Shock and Coping Strategies In India: Household's Welfare Analysis	Mohammad Kashif Khan
A Quantitative Approach to Comparing the Impact of Health Financing on Health Care Services Utilization in India	Labhita Das, Ajit Kumar Jaiswal
Public and Private Divide in Health Care Spending in India: What Factors Explains the Gap?	Harchand Ram
IIB: Morbidity and Its Implications for Children (Venue : Room No : 117, Ground Floor) Time : 4:15-5:45 P.M	
Chairperson	Udaya Mishra
Discussant	Subrata Mukherjee
Rapporteur	

Title of the paper	Author(s)
Need For Preventive Health Care In Knowledge Industries: A Case Study On Information Technology Employees In India	Nausheen Nizami
Understanding Maternal and Child Health on a Continuum: Major Determinants of Continuum of Care in Maternal and Child Health Services Utilisation In India	Ravi Durga Prasad
Health Adjusted Life Expectancy in Tamil Nadu	P.Devi Priya
Measles Vaccination coverage among the children of Northeastern States, India: A Spatial and Decomposition Analysis	Vinod Joseph K J, Kh. Jitenkumar Singh
Utilization of Maternal and Child Health Care Services: A Geospatial Analysis of India	Navtez Singh
IIC: Concerns of Health Equity (Venue : Room No :217, First Floor) Time : 4:15-5:45 P.M	
Chairperson	Mala Ramanathan
Discussant	Achin Chakraborty
Rapporteur	
Title of the paper	Author(s)
Decomposing Socio-Economic Inequality in the Utilization of Maternal Health Services in India, 2005-16	Bal Hasan Ali
Decomposing of Socio-economic Health Inequality in Utilisation of Delivery Care Services in Uttar Pradesh	Renu
Effect of Healthcare Spending on Economic Inequalities in India	Soumendu Sen, Sanjay Kr. Mohanty
Tea Break (5:45-6:00 P.M)	
Training Workshop (Venue : Auditorium) Time : 6:00-8:00 P.M	
<ol style="list-style-type: none"> Propensity Score Method for Policy Evaluation Causality Analysis in a Broader Sense 	Bijan J. Borah , Associate Professor of Health Services Research, Mayo Clinic College of Medicine, USA Professor Slim Haddad

General Body Meeting (IHEPA Members Only) (Venue : Board Room) Time : 6:30-7:30 P.M	
January 25, 2019	
Technical Session : III	
IIIA : Kerala's Health Status : Future Concerns (Venue : Board Room, Ground Floor) Time :9:00-10:30 A.M	
Chairperson	Bijan J. Borah
Discussant	B K Ekbal
Rapporteur	
Title of the paper	Author(s)
Regional Disparity of Healthcare Infrastructure: Emergence, Growth & Transformation of Philanthropic Initiatives in Kerala	Sajid M S
Spatial Analysis To Examine The Effects Of Lifestyle And Dietary Behaviour On Diabetes Among People Of Kerala	Ishita Pal, SampurnaKundu
Health Sector Human Resource Planning For Kerala: Methodology For Development Of A Checklist For Prioritization For New Courses Under Kerala Health University: A Novel Experience.	Nair MKC, Rajamohanan K, Harikumaran Nair, Anish T S, Remadevi
Cereal Consumption Diversity And Type 2 Diabetes: An Association In Kerala	Nimish Sharma and Shruti Gupta
Developments And Emerging Issues In Public And Private Health Care System In Kerala: A Study	Mithun.P.V
IIIB: Violence and Pregnancy Outcome : Policy implications (Venue: Room No :117, Ground Floor) Time : 9:00-10:30 A.M	
Chairperson	Benson Issac
Discussant	KS James
Rapporteur	

Title of the paper	Author(s)
Too much care? Private health care sector and surgical interventions during childbirth in India	Mitul Surana and Ambrish Dongre
Variation in extent of caesarean delivery and associated cost : Who is lagging behind	Basant Kumar Panda
The Progression of Domestic Violence from Generation to Generation and Its Impact on the Reproductive Health of Women: An Analysis of Gujarat	Het D Shah
Differences in Repeated Caesarean Deliveries Rates Between Public and Private Health Care Facilities: A Study on Successive Births In India	Pratishtha Chaudhary
Intimate Partner Violence during Pregnancy and Its Effect on Quality of Antenatal Care and Related Expenditure	Dibyasree Ganguly, Srinivas Goli, Anu Rammohan and Sanghamitra Sheel Acharya
IIIC: Communicable Disease and Population health (Venue :Room No : 217, Second floor) Time :9:00-10:30 A.M	
Chairperson	K Selvaraju
Discussant	Udaya S. Mishra
Rapporteur	
Title of the paper	Author(s)
A Multilevel Analysis to Show the Linkage of STI and Genital Ulcer Among Women With Number Of Sex Partners	Sampurna Kundu, Ishita Pal
Provision of DOTS by a family member to prevent treatment default in tribal and hard to reach areas in the state of Chhattisgarh, India: An implementation research study	Fidius Kerketta, Ashish Sinha, Narayan Tripathi, Arti Borkar, Shashank Gupta, Anupam Nahak
Availability and use of LLIN mosquito nets in highly Malaria endemic Bijapur district of Chhattisgarh, India- An operational research study	Fidius Kerketta, Narayan Tripathi, Shashank Gupta, Prabir K Chatterjee
An Economic Analysis Of Coastal Pollution and Health Care In Chennai City	M. Fakir Ismail

Tea Break (10:30-10:45 A.M)	
Technical Session IV	
IVA: Maternal and Child Health : Way forward (Venue : Board Room, Ground Floor) Time :10:45--12:15 P.M	
Chairperson	
Discussant	Mala Ramanathan
Rapporteur	
Title of the paper	Author(s)
Effect of short Inter-Pregnancy Interval (IPI) on pre-term birth in India: from Retrospective Survey Data	Ajit Kumar Kannaujiya, Kaushalendra Kumar, Ashish Upadhyay
Parental migration and its effect on children's health status and access to health care services in India	Monalisha Chakraborty, Subrata Mukherjee
Curative versus Preventive Healthcare in Developing Countries: The Case of Menstrual Hygiene in India	Prasenjit Sarkhel, Montu Bose
Differentials in Menstrual Practices among young women in India: Evidence from NFHS-4	Nilanjana Gupta, Abhishek Sharma
Effect of the short inter-pregnancy interval on preeclampsia/eclampsia in India: Evidence from National Family Health Survey (2015-16)	Kaushalendra Kumar, Ajit Kumar Kannaujiya, Ashish Kumar Upadhyay
Maternal Health and Access to Healthcare among Migrant Construction Workers in Ahmedabad, India	Divya Ravindranath
IVB: Health & Nutrition : Linkages (Venue : Room No : 117 Ground Floor) Time :10:45--12:15 PM	
Chairperson	D Narayana
Discussant	Shreelata Rao Seshadri
Rapporteur	

Title of the paper	Author(s)
The Burden of Anemia and its Determinants among Non-Pregnant Women in India: Insights from a Spatial Analysis	Deepika Phukan
Participation in Mid-day meal programme and Nutritional Status of primary and upper primary school children in Jaunpur district of Uttar Pradesh	Gudakesh
Gender difference in feeding, nutrition and health care of children in EAG State of India.	Vandana Tamrakar
The Change in the Concentration of Acute and Chronic Undernutrition among Under-Five Children across different Household Socio-Economic Conditions in Northeast India	Wahengbam Bigyananda Meitei
Impact Evaluation of the Program ‘JananiSurakshaYojna’: Using Coarsened Exact Matching Approach	Aditi, Ajit Kumar Jaiswal
IVC: Universal Health Coverage : Way Forward (Venue : Room No : 217, First Floor) Time : 10:45--12:15 PM	
Chairperson	Srinivas Goli
Discussant	
Rapporteur	
Title of the paper	Author(s)
Can India Achieve SDGs target related to IMR level till 2030? : A Bayesian Study	Abhinav Singh , AnuragVerma, Gyan Prakash Singh , Pramendra Singh Pundir
Theoretical Considerations on Universal Healthcare in Tamil Nadu	C. Saratchand
Conceptualizing Population Ageing in India as a Triumph of Public Health: An Analysis Using New Ageing Indicators	Arun B Chandran
Setting evidence-based priorities for Universal Health Coverage – Where’s the evidence?	Laura E Downey, Neethi V Rao, K.V Selvaraju, Maria De Francesco, Shankar Prinja, Anju Sinha, Rajni Kant, Arvind Pandey, Francoise Cluzeau, Kalipso Chalkidou

Panel Discussion on Economics of Ageing (Venue : Auditorium) Time : 12:15-1:15 P.M	
Chairperson	Sanjay Kumar
Rapporteur	
Panel Members	
Irudaya Rajan.S	
D. Narayana	
Achin Chakraborty	
K.S. James	
Lunch Break (1:15-2:15 P.M)	
Technical Session : V	
VA: Health Insurance (Venue : Board Room, Ground Floor) Time :2:15--3:45 P.M	
Chairperson	Slim Haddad
Discussant	D Narayana
Rapporteur	
Title of the paper	Author(s)
Unit Cost Per Output Indicators of Various Programmes at PHC Level in Medak District	S. Anuradha, S.Sandhya
Who Will Pay My Bills? Assessment of Health Insurance Schemes on Health Care Spending in India through Capability Approach	Rinshu Dwivedi
Can India Leap towards Universal Health Coverage through Ayushman Bharat Programme? A Critical Examination Based on Health Insurance Coverage, Distribution and Predictors	Vikash R Keshri, Saswata Ghosh
Private Hospitals in Health Insurance Network in India:A Reflection for Implementation of Ayushman Bharat	Pritam Datta Mita Choudhuri
Outpatient care and expenses: Are they insignificant to ignore in designing an insurance programme?	Subrata Mukherjee Anoshua Chaudhuri

VB: Health Systems : Concerns and way forward (Venue : Room No : 117, Ground Floor) Time: 2:15--3:45 P.M	
Chairperson	Shreelata Rao Seshadri
Discussant	
Rapporteur	
Title of the paper	Author(s)
ASHA to ANM: Challenges and Opportunity- A Policy Analysis	Narayan Tripathi, Samir Garg, Asmita Behra, Arti Brokar, Dilip Singh Mairembam
Does subsidizing construction of toilet play an effective role in reducing open defecation in rural India? An impact evaluation of Swachh Bharat Mission	Ms. Debasree Bose
Assessing The Capacity Of Social Behavioural Change Communication/ Information Education Communication (Sbcc/Iec) In The Health Medical And Family Welfare Departments Of Three States Of Maharashtra, Karnataka And Telangana	Subodh Kandamuthan, Sudarshan Gautham
Understanding the implementation of the Chhattisgarh Rural Medical Corps Scheme to retain human resources for health in rural areas in the state of Chhattisgarh	Deepika Joshi, Sulakshana Nandi, Esha Gill and Tanvi Mahajan
Private Hospitals in India-Regional Perspective	Chetana Chaudhuri, Pritam Datta
VC: Health Care Financing-2 (Venue : Room No : 217, Second Floor) Time : 2:15--3:45 P.M	
Chairperson	K.S. James
Discussant	
Rapporteur	

Title of the paper	Author(s)
Is There Really Granger Causality between Child Health and Economic growth in India?	Gulnawaz Usmani, CS Verma
Cost Of National Vector Borne Disease Control Programme In North India	Divya Monga, Ramesh Verma, Dinesh Kumar, Gagandeep Singh Grover, Akashdeep Singh Chauhan, PVM Lakshmi, Shankar Prinja
Does Public Health Centres Protect Poor from High Out-of-Pocket Expenditure in Hospitalisation among Indian States	Anjali Dash, Sanjay Kumar Mohanty
Does affordability matter? Examining the trends and patterns in health care expenditure in India	Rinshu
The Determinants and Inequalities related to Catastrophic Expenditure of Non-Communicable Diseases in India: Evidence from NSSO 71st Round on Social Consumption	Cyril Philip, Thoufeeque Rahman & P. Devika
Closing ceremony (Venue : Auditorium) Time : 3:45-5:00 P.M	
Welcome	Prof. D Narayana
Remarks by the IHEPA President	Prof. Shreelata Rao Seshadri
Concise of the Conference	Subrata Mukherjee
Valedictory Address	Prof. V.K. Ramachandran Vice Chairman, Kerala State Planning Board
Distribution of Best Paper prizes	Prof. V.K. Ramachandran
Vote of Thanks	K.S. James



Deconstructing Universal Health Coverage

Slim Haddad

It may be best to begin with the following: “It (UHC) could prove a major breakthrough or a great white elephant for low-income and middle income countries depending on the balance between global-level and country-level leadership, institutions, ideas, interests, and resource priorities. Strong leadership as well as administrative capacity is needed within countries to determine contextually relevant approaches and drive implementation” (Agyepong 2018 2234). We highlight the need to feed policies and promoters of UHC with more than nice words on the fairness of UHC, and the need for empirical evidence on their impacts, and not only on utilization of health care, or equitable redistribution of access to health care. UHC is complex, and could be costly and demanding for the country. Evidence on its allocative efficiency should be extremely useful.

Currently, evidence are sparse. There is limited evidence on the contribution of UHC to improve population health. So basically, UHC promoters and decision makers have to rely on their hypothetical benefits. Health economists have a role to play and a responsibility in providing robust evidence on impacts. India has one of the world’s largest community of economists active in development economics. India has also the advantage of being large and diverse. With this reservoir and its unique settings, India combines a unique set of ingredients to become a champion in health outcome analysis.

Of course, this cannot come spontaneously. The development of longitudinal population-based research platforms and observatories could become extremely useful to support robust impact evaluation. The initial effort made in Kottathara, Wayanad by the collaborative effort between University of Montreal and Centre for Development Studies may be noted. My experience with the longitudinal observatory we built in Burkina Faso that had opened the door for relevant and sound evaluations of natural experiments and the impacts on health of national policies (malaria interventions, and financial support for care) may be cited here.

Irene A Agyepong 2018 Universal health coverage: breakthrough or great white elephant? Lancet 392:2229-36

Burden of Cancer Prevalence and its determinant among women in Bihar: A study based on National Family Health Survey (2015-16)

Shobhit Srivastava*
Himani Sharma*
Kaushalendra Kumar*

**International Institute for Population Sciences, Mumbai.*

According to National Institute of Cancer prevention and research (NICPR), average estimated prevalence of Cancer in India is 25 lakhs in 2010. According to NFHS-4 the prevalence of cancer among women in Bihar comes out to be 610 cases per lakh in comparison to 170 per lakh cases at national level. The study tries to understand the prevalence of cancer in all districts of Bihar and to investigate the factors associated with cancer prevalence among women in Bihar. The study is based on data from NFHS (2015-16) conducted by IIPS, Mumbai. Bivariate analysis was done and further analysis was performed using Poisson regression model to establish association between all independent predictors and the outcome variable. Darbhanga tops in cancer prevalence among women followed by Gopalganj and Supaul district of Bihar. Asthma and diabetes emerged as the most important biological determinants, in case of behavioural factors, alcohol consumption (IRR = 12.09, $p \leq 0.05$), arsenic exposure (IRR = 2.09, $p \leq 0.05$) and piped water source (IRR = 3.69, $p \leq 0.05$) proved to be important determinants for cancer prevalence among women in Bihar. Women belonging to rural areas and poorest wealth quantile were at more risk of developing cancer in Bihar. A wide regional variation is found in the prevalence of cancer among women in districts of Bihar. Alcohol consumption and exposure to arsenic in ground water constitute most important determinants for prevalence of cancer in Bihar. When given these high estimates of cancer prevalence among women in Bihar, innovative interventions and control strategies are needed in order to check upon the problem.

Key Words: *Women; cancer; Poisson regression; Bihar; arsenic.*

Hypertension and Heart Diseases among Adults in India: Evidence from NFHS-4

Ayintika Biswas*

**International Institute for Population Sciences, Mumbai.*

Increasing life expectancy puts the health issues of the middle-aged and the elderly population into focus. Hypertension or high blood pressure still remains one of the most important preventable contributors to adult mortality and morbidity and a major public health challenge worldwide. Hypertension, in addition to being the most important modifiable risk factor for cardiovascular diseases (CVDs), was also responsible for around 7.6 million (13.5%) deaths globally. There is a strong and frequent association between arterial hypertension and coronary heart disease (CHD). High blood pressure is responsible for two-thirds of all stroke incidences and half of all coronary heart diseases. Studies should be conducted to find reasons for the increasing prevalence and poor control of the disease, and even approaches to prevent or delay the onset of the condition. National Family Health Survey 4 (2015-16) data has been used for the present study. Bivariate analysis has been used for studying the demographic, socio-economic and behavioural characteristics of the population as categorized by their blood pressure status. Multinomial regression analysis has been

utilized to study the co-factors of different stages of hypertension. Logistic regression has been utilised to assess the association of hypertension with CHD among the male and female population of India. It has been found that around 8.3 percent of the male population in the age group mentioned above is hypertensive and 45.6 percent of the total male population is pre-hypertensive. The figures for the female population are 26.9 percent of pre-hypertensive and 4.8 percent of hypertensive population. A higher age, rural place of residence, a richer wealth quintile, religion other than Hinduism, occasional consumption of poultry items and drinking are also more likely to place a female in the hypertensive category. The odds of females having CHD when all the socio-demographic predictors are taken into consideration is 1.3 times as compared to non-hypertensive females, while the corresponding figure for males is also 1.3 times for hypertensive males as compared to non-hypertensive males. Hypertension, being a major risk factor for occurrence of CHD in an individual, can be partly controlled by anti-hypertensive treatment, which has an important role in both primary and secondary prevention. Some important steps to control the hypertension epidemic are use of primary health care as the most important point of control, involvement of nurses in diagnosis and follow-up of patients and take the experiences of the developed countries into consideration while strategizing for drug treatments.

Cost Utility Analysis of the good glycaemic status compared to the poor glycaemic status among adult diabetic subjects in north Kerala

Dr. Biju George*, Dr. Rajmohanan Pillai**

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Diabetic status lead to increased mortality and morbidity and also loss of quality of life (QOL) and utilities and achieving good glycaemic status require increased cost spending. Many trial of drugs for diabetes have shown that they are cost effective, but what is the cost effectiveness of having a state of good glycaemia is not well described. A cross sectional survey was conducted in Kozhikode, Kerala. A total of 220, Known diabetics, on modern medicine management were selected from the Non Communicable disease register. Cost incurred were collected using a cost diary and societal perspective was used. Glycaemic control was measured using the HbA1c level, while the QOL was measured using EQ-5D-5L, EQ-VAS and SF-12 v2. ICER were estimated and were plotted in the cost effectiveness plane and uncertainty in the ICER measure were captured using the bootstrapping technique. Of the 192 study participants who completed the study, Female predominated and most the participants were in the lower socio-economic status and were not studied more than primary school. Glycaemic control was poor with only 34.4% having a value of 8% or less. None of the variables studied were significantly related to glycaemic control. Quality of life was affected in both physical and mental health summary scores and in all domains. Mean utility scores were 0.61 and 69.2 for the EQ-5D-5L and EQ-VAS respectively. Utility scores were significantly more among the good glycaemic group. Factors influencing the utility scores were - gender, age of the participants and presence of comorbidity. Mean Direct, Indirect and Total cost were 2331 INR, 641 INR and 2972 INR respectively. Direct cost contribute to 78% of the total health cost. ICER calculated for different outcome parameters showed that the good glycaemic control strategy was always cost saving whatever may be the outcome. For the EQ-5D-5L and EQ-VAS the ICER were in -53150, -53150 per QALY respectively. Achieving a good glycaemic status is cost saving and improves the utility of diabetic

subjects. Since our health system have large proportion of poor glycaemic subjects, the system has to adapt to higher standards of care management to ensure good glycaemic status among diabetic.



Overweight and Obesity among Children in India: Association with Commercial Baby Food Consumption

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Child's health status in early days of their life has a lot of impact on their growth and other functioning which is affected due to childhood obesity. An over-weight or obese child has increased the risk of developing various non-communicable and degenerative diseases like type 2 diabetes, stroke, hypertension and some types of cancer. The main objective is to examine the impact of consumption of baby-food on overweight or obesity among children in the age group of 6 to 23 months, using National Family Health Survey-4 (2015-16). This study attempts to look for several risk factors using statistical techniques like Propensity Score Matching and Logistic Regression. There has been a rise of about 33% in the proportion of overweight or obese children in the last one decade. Findings from the analysis corroborate that there is a positive association of commercial baby-food like ceralac and overweight or obesity among younger children. Logistic regression shows a positive association (Odds Ratio 1.3) of commercial baby-food like ceralac on obesity among younger children. Also findings from an advanced statistical technique i.e. Propensity Score Matching shows that on an average, there is 10 percent more probabilities of being overweight or obese for children consuming it. Gender differentials were observed in the consumption of baby-food in children. Girls had lower odds of being fed with baby food. The adjusted odds as well as propensity score matching test confirmed the increase in the proportion of overweight or obesity in children who consumed this baby-food.

Need for Expanding Primary Care for Chronic Non-Communicable Diseases in Urban Slum Population of Chhattisgarh – Findings from a Primary Survey

**Sayantana Chowdhury, Samir Garg, Asmita Behera,
Preeti Gurung, Rashmi Tirkey**

The care of NCD is resource intensive and increases with age. Thereby it requires a substantial amount of spending for seeking medical treatment. Most of the literature in India on determinants of health spending has focused on hospitalization, and there are relatively fewer separate studies on disease specific and outpatient departments (OPD) care for NCD expenditure. In presence of these existing evidences, the present study should be seen as an attempt to contribute knowledge around the determinants of expenditure in OPD care for NCD. The key feature of the study is that it provides the evidence on OOPE in OPD for NCD care in a highly vulnerable urban slum setting. Based on the results we discuss existing policy gaps in addressing the burden of OOPE from OPD care for NCD in the urban slums of Chhattisgarh.

This was a community based cross-sectional study among 43000 individuals residing in urban slums of Chhattisgarh. It was conducted in urban slums of 19 cities of Chhattisgarh. Participants were randomly selected from each slum cluster. The data was analyzed using Stata V.14.

Overall, the mean and median OOPE for OPD NCD care was INR 4819 and INR 1000 respectively. The mean OOPE in private hospitals (INR 5534) was nearly double of the mean OOPE in public hospitals (INR 2890). In the disease specific OOPE, the highest OOPE was for cancer (INR 53000) followed by heart diseases (INR 12960), Stroke (INR 11167), Mental Disorders (10587). OOPE for OPD care less than (INR 10000) were for Gastric Ulcers, Asthma, and etc.

Due to inadequate access to care, NCDs are causing large OOPE to urban poor families and inadequate treatment is leading to severe form of morbidity, disability and mortality. Private sector care is costly and therefore rarely continuous. The results of the study emphasize the need for comprehensive primary care services for NCDs for urban slum population. Such arrangements of care should include drugs and outpatient care. Urban poor need more public facilities close to them which a) should provide care for NCDs b) which should be open in the evening time when people can access them easily c) free medicines especially for hypertension, diabetes, epilepsy, respiratory conditions and sickle-cell disease.

Psychological Distress and Well being

Economic Inequalities and Mental Health Problems among Elderly in India, China, Ghana, Russia, and South Africa: A Decomposition Analysis

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The gap between the need for treatment and its provision for mental health is large all over the world. The World Health Organization reported that the prevalence of mental disorder is the highest among older people (15%) and around 6.6 percent of all disability endorsed to mental.

Rapid changes in social structures resulting from work stress, unemployment, unhealthy lifestyles, aging, etc. have led to increasing levels of loneliness, anxiety, sleeping disorders, and stress. Using secondary data from Global Ageing and Adult Health (SAGE), WAVE-1, this study quantifies the extent of the relative contribution of socio-economic factors to the inequality in mental disorders among elderly in India, China, Ghana, Russia, and South Africa. This study applied Wagstaff decomposition analysis, and CI estimates to quantify the extent of relative contribution to the inequality. This paper will present prevalence of mental disorders among elderly and quantifies the extent of the relative contribution of socio-economic factors to the inequality in mental disorders among elderly in India, China, Ghana, Russia, and South Africa. The result shows that more than about half of the elderly in India are suffering from severe mental disorders, and about one-third of the population are suffering from severe mental disorders in Russia, Ghana, and South Africa. CI estimates show considerable economic inequalities in mental disorder in India (CI=-0.022), China (CI=-0.117), Ghana (CI=-0.037), South Africa (CI=0.004), and Russia (CI=-0.011). Results of CI estimates portray that poor people are suffering from the severity of mental disorders. Results of decomposition analysis reveal that place of residence, sex, education, and employment are most critical factors contributing and explaining maximum inequality among people in India, China, Ghana, Russia, and South Africa. Contribution of place of residence to inequality is Russia (34%), India (22%), Ghana (34%), south Africa (-27%), and china (-9%). Age, education, and sex are contributing more inequality for mental disorders in each country. Employment is contributing more in developing countries as compared to developed countries. Percentage contribution of sex to the inequality for mental disorders is Russia

(51%), south Africa (38%), Ghana (40%), India (16%), and China (51%). Percentage contribution of education to the inequality for mental disorders among people is negative in every country. Contribution of education to inequality for mental disorders is Russia (-20%), India (-18%), Ghana (-16%), south Africa (-24%), and china (-33%).



Mental health prevalence and health seeking behavior in India

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Depression is a significant contributor to the global burden of disease and affects people in all communities across the world. India enters the new millennium with many changes in the social, political, and economic fields with an urgent need for reorganization of policies and programmes for mental health. The objective of the study is to study the prevalence of depression and to study the unmet need for treatment among depressed people. Present study utilizing the secondary data from study on global ageing and adult health (SAGE), India. This is implemented in six national representative states namely Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh, and West Bengal. A separate bivariate analysis and multivariate logistic regression analysis are carried out to examine the socio-economic and demographic factors, risk factor, co-morbidities affecting the dependent variables used in the study i.e. depression. The study reveals that the prevalence of Symptom based depression is high than self-reported, around more than 70 percent people are not aware that they having depression and those who know about their disease in them very fewer people taking treatment. It is found to be highest in both less developed and more developed states Uttar Pradesh and Karnataka. It is found high in person with higher age, low educational level, poor, in currently married and widowed/divorced/separated. Unmet need for medication and treatment is found to be high for depression and it gets decreased as it co-morbid with other diseases. The high unmet need for medication in the present study stresses for efforts to provide better health care to them. The results show the urgency of addressing the issue of depression as a public health priority to reduce burden and disability and to improve the overall health of the population.

Key words: *Depression, Health-seeking behavior, co-morbidities*

The impact of chronic multimorbidity, anxiety disorder and sedentary behavior on disability and functional impairment among older adults: A community-based study

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Lacunae in existing literature, incite the need to investigate the impact of multimorbidity on disability and impairment among older adults belonging from the developing nations. This study aimed to employ the relationship between the presence of multimorbidity, anxiety, sedentary behaviour with disability and functional impairment (WHO-DAS) among the older adults of Varanasi district of Uttar Pradesh, India. A cross-sectional survey has been conducted imploring multi-stage random sampling procedure which was conducted among older adult (50+ years) in Varanasi District of Uttar Pradesh, during November 2017-March 2018, for 492 respondents. Disability & functional impairment use as outcome variable by using the 12-item index of self-reported WHO-DAS 2.0. Further multimorbidity (≥ 2 chronic disease) anxiety disorder, sedentary behavior including with other biomedical & generic factor (age, sex, self-rated health (SRH)), socio-economic factor (place of residence, education, religion, caste, marital status, wealth quintile) and psychological factor (happiness) are used as important predictors. Descriptive and multivariate binary logistic regression is employed to assess the aim of the study. Multivariate logistic regression revealed that higher in age with poor SRH, having moderate to severe anxiety, suffering from at least single & multiple morbidities among currently married person have more odds of experiencing disability and functional impairment. At the same time; having better happiness level, are observed to experience lower odds of having disability and functional limitation among older adults of Uttar Pradesh, India. Empirical evidence demonstrates that multimorbidity predicts a significant increase in disability and functional impairment among the elderly. A higher number of morbidity conditions and greater disease severity highlight the significance of considering physical functioning while designing intervention and systems of care for patients with multiple chronic morbidities. However, further studies are needed to employ a clear definition of multimorbidity. The pursuit of this research will improve health to better understand the impact of chronic disease on elderly health and disability and impairment.

Keywords: *Anxiety, disability, functional impairment, multimorbidity, sedentary behaviour.*



An Assessment of Physical Health among Older Persons: Triangulating Available Data Sets in India

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Ageing is a recent phenomenon in India, which calls for exploring into physical functioning and conditions related to older ages. Evaluation of the physical functioning and its associated factor may have implications for older persons. The objective of the study was to assess disability, injuries and frailty and find out the important socioeconomic factor influencing it among older persons in India. SAGE Wave-1, BKPAI and Census of India-2011 were used for the analysis. Frailty index and functional limitation score was calculated. The fall and road traffic related injuries were self reported. Age has an important influence on health among older persons. Increasing age was found to be very significant impact on each of the physical health domains. It may be explained by the increase in functional limitation resulting in less physical movement in turn poor physical health for older person in higher age groups. Gender, education and wealth quintile was found to be influencing physical health among older persons. Non-migrant and working older persons also have better physical health compared to migrant and nonworking older persons respectively. The geographical migration may enhance stress due to unfamiliar environment leading to poor physical health among older persons. Our study have suggested that socio-demographic variables like gender, age, marital status, and education and migration status are few important factor which influences physical health among older persons. These gaps expressed in our analysis must be taken into account for the welfare of older persons in next few decades. These findings may also help in drafting strategies and intervention for healthy ageing in India.

Keywords: *Physical health, Older Persons, Disability, India*



Prevalence of Morbidity and its association with Disability and Psychological Distress

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The prevalence of morbidity among elderly has an important association with the disability and psychological distress. It significantly influences their physical functioning and overall psychological well-being. This study aims to assess and determine the association of morbidity with disability, and psychological distress among the rural elderly population in Odisha, India. The specific objectives are to assess the prevalence of various morbidities among the elderly, and to examine the association of various chronic conditions with the prevalence of disability and psychological distress.

A cross-sectional survey using multi-stage random sampling procedure was conducted among elderly in Bargarh district of Odisha. The survey was conducted among 310 respondents. Descriptive statistics has been used (Cross-tabulation) to explore the association of morbidity with disability and psychological distress.

Result shows a higher prevalence of multi-morbidity among the elderly population (57%). Visual disability (33%) was the most prevalent physical disability followed by the disability of mobility (17%), and disability in chewing (16%) and hearing (15%). The prevalence of functional disability and psychological distress was comparatively higher among the females (52% and 60%) than males (48% and 40%). The medical condition such as chronic lung disease (COPD), Hypertension, Alzheimer's disease, Cataract, Loss of natural teeth, Accidental injury, Skin disease and Paralysis were significantly associated with the physical disability. Elderly in the age group of 70+ were at the higher risk of functional disability and psychologically distressed.

This study explored the association between morbidity, disability and psychological distress among the elderly population. Age and gender specific policy formulation is an essential component to insure a healthy ageing in the countries like India. For reducing the burden of morbidity, disability and psychological distress among the elderly population, more priority should be given to the female elderly and elderly in the higher age groups such as 70+.

Keywords: *Disability, Morbidity, psychological distress, association, elderly, Odisha, India.*

Socio-econometric dynamic models of health status suicide in three Scandinavian countries using time series ARDL

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Dynamic time series ARDL modeling is done for three Nordic countries, where suicide rate per 100,000 persons is the dependent variable. The objective is to compare the similarities /dissimilarities between long- and short run association/causality between chosen independent variables and the dependent variable, with robust diagnostic test results to support the findings. After doing unit root tests, selecting optimal lags, long- and short term ARDL (bound testing), various diagnostic tests are done to find the independent variables, which have long- and short run association. For Denmark, there is a long run significant relationship between private health expenditures and suicide rate. For Norway, divorce rate impacts suicides in the long run as does private health expenditure. In case of Sweden, there is a long-term association of private health expenditures and unemployment with suicide rate. The speed of adjustment towards long run equilibrium, as revealed by the error correction term, varies.

Keywords: *ARDL model, suicide rate, unit root test, Nordic countries.*



Contraceptive Use Dynamics among Urban Poor in Three Cities of India

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This paper attempts to study the contraceptive use dynamics among urban poor in three cities of India by women's background characteristics and determinants by using baseline, representative data from Bhubaneswar, Jaipur and Pune from Health of the Urban Poor survey. Data were collected from 4551 currently married women in Bhubaneswar (1322), Jaipur (1613) and Pune (1416). Bivariate and multivariate analyses are used to examine the influence of background characteristics on family planning use and unmet need for family planning. The analysis revealed that, more than 7 out of 10 women in Pune and Jaipur and half of women in Bhubaneswar used any method of family planning. More than four-fifths of ever users in Bhubaneswar, 6 out of 10 ever users in Jaipur and 8 out of 10 ever users in Pune used contraception for the first time when they had two or fewer children. The predominance of sterilisation is observed among large majority of users of family planning in three cities. The spacing is not very common but most of the contraceptives uses are for limiting family size. There are no differentials in use of any modern method of family planning both in slum and non-slum areas. The slum women are more likely to be sterilized than to use other modern spacing and any traditional method. Age of the women and educational levels of women have a significant effect on the use of contraception. Therefore, these aspects may be given due attention while framing family planning programme. The unmet need for family planning is higher in Bhubaneswar than in Jaipur and Pune. The unmet need for family planning is relatively high among women living in non-slum areas than slum areas. Programs seeking to target the urban poor in three cities and elsewhere in India may be better served to identify the less educated women and younger women and target these women with appropriate family planning messages and methods that meet their current and future fertility desire needs.

Keywords: *Contraceptive, unmet need, urban poor, slum, non-slum, three cities and India*



Pattern and Dynamics of Public Health in Rural Punjab: A Gender Perspective through Empirical Considerations

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This paper traces the various aspects of the public health in rural Punjab. For this we surveyed 200 households across socio-economic categories from ten villages of two districts of Punjab. Quantitative data and qualitative data regarding socio-economic characteristics, information regarding water availability, drainage and sanitation, domestic wastage, personal health issues collected and examined across gender, household level and at the village level. The various dimensions of public health from the gender perspective examined at the village as well as household level. How did women as an agency think and play a role to identify with public health issues in the hierarchical patriarchic society of rural Punjab. The paper explored a pathetic situation in the survey villages across gender and economic categories of the households. The implications of the study is to revitalize the role of panchyats in the village which can play a important role to rebuild infrastructure around public health and it should be on the primary priority list of the village panchyats and the residents of the village should be aware about their villages. The civil society and educated people in and around the village can make plans to develop their own villages on the pattern of some villages in Punjab which are maintained and developed with regard to public health by the NRI's from rural Punjab. And various institutions which deal with public health should play a proactive role to pull out the rural society from this public health crisis.



Accessing Healthcare for LGBTQ Community in India: Is It Still an Ordeal?

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Every patient has the right to receive treatment without any discrimination based on his or her illnesses or conditions, religion, caste, ethnicity, gender, age, sexual orientation, linguistic or geographical/social origins and was not the same for LGBTQ (Lesbian Gay Bisexual, Transgender, Queer) community. The discrimination faced by the community in availing health care needs was highlighted by Justice Indu Malhotra, part of the five-judge bench hearing the petitions for decriminalizing Section 377 of the Indian Penal Code. There are hardly any anti-discrimination laws in place to safeguard equality in healthcare access. To look upon the health access to the LGBTQ community over the years and lessons that can be learnt from other countries. The study utilized mainly secondary data. Besides India, the countries like Australia, USA and Brazil were studied in detail as the best practices in access to health care among LGBTQ community were concentrated here. Healthcare itself is least priority for LGBT people simply because of the fear of what it might entail. The various issues faced by the LGBTQ community in accessing healthcare in India were: Lack of awareness, Absence of legitimate treatment, Fear of discrimination, Infrastructural issues and Lack of health insurance. According to a 2005 study to assess attitudes, knowledge and skills of medical students in India with respect to LGBT population, a significant 55.43 per cent thought homosexuality was a psychological disorder and required therapy.

The practices from the above countries has demonstrated that the prioritization of issues faced by the community, developing and implementing the necessary policies, guidelines and actions, further guaranteeing the sustainability of these was rudimentary that can be harnessed by Indian healthcare sector.

While most of India is really lagging in this aspect, A South Indian state has really taken it upon its shoulders to do something about it. Kerala was the first state to introduce a state-wide policy and implement real changes. Access to general health care is among the least researched fields of transgender health and reflects inadequate knowledge of transgender health needs and their disease burdens by primary health care workers and health professionals due to inadequate population approaches; and stigma which keeps them out of health services thus a necessary comprehensive approach which includes gender affirmation, improved health systems and access to health care and effective partnerships with local transgender communities to ensure responsiveness of and cultural specificity in programming.

Poverty Impact of Out-of-Pocket Expenditure on Health Care in Rural Assam

Dr Joel Basumatary and Professor Nirankar Srivastav

Out-of-Pocket (OOP) expenditure on health care is one of the debilitating factors pushing households into poverty. Household's, especially the lower income groups and which do not have security measures like medical insurance are the worst sufferers when faced with health shocks. Conventional methods of poverty estimation do not take into account health care consumption, which might understate the poverty headcount. In this study poverty headcount and poverty deepening have been estimated taking into account the expenditures on health care. The data have been collected from Chirang district of Assam. The poverty headcount is the difference between post-poverty headcount (post Hp) and pre-poverty headcount (pre Hp). The pre-payment (i.e. pre-OOP) 'poverty headcount' is calculated by comparing household's consumption expenditure gross of payments for health care with the poverty line defined by the planning commission of India (2001). The post-OOP payment 'poverty headcount' is computed by netting out health care payments from household's consumption expenditure and then comparing with the poverty line. The intensity of poverty which captures the average amount by which households go below the poverty line because of OOP expenditures has been estimated with the help of the methods introduced by Wagstaff and Doorslaer (2003). OOP expenditure pushes some households into poverty. This is more serious with the hospitalization care compared to the OOP expenditure on non-hospitalization. The poverty gap or the intensity of poverty of the overall OOP expenditure is Rs 279.28, which varies between outpatient and inpatient OOP expenditure.

Keywords: *Medicines, Out-of-Pocket, Poverty Impact, Healthcare, Public Health*



Trends in morbidity, out-of-pocket and catastrophic health expenditure in India, 2004-2005 to 2011-2012 (Insights from a nationally representative panel survey, 2004-2015)

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Health systems can deliver health services, preventive and curative, that can make a difference to peoples' health. However, accessing these services can lead to individuals having to pay catastrophic proportions of their available income and push many households into poverty. The present study aimed to examine the trends in morbidity, out-of-pocket and catastrophic health expenditure in India, 2004-2005 to 2011-2012.

This study used data from two rounds of Indian Human development survey (IHDS) which are conducted during 2004-05 (IHDS-I) and 2011-12 (IHDS-II). IHDS I & II were designed to complement existing Indian surveys by bringing together a wide range of topics in a single survey. To meet the objective analysis was performed for estimation of out of pocket expenditure followed by the catastrophic expenditure faced by a household and then what are the households that have been pushed into poverty due to the health payment. And at last what are the coping strategies for the households for payments of health care expenditure.

The out of pocket expenditure is more in rural than their counterpart urban in both period, 2004-05 and 2011-12. However, the increase in the urban is more as compared to the rural areas over the period, this variations in the out of pocket expenditure can be related to the hospitalization rate. The education of the household head and the health care spending is directly comparative, as the education of the household increasing then the out of pocket health expenditure is also increasing. Scheduled caste tends to spend more OOP as compared to the scheduled tribes in both the rounds.

The burden of health expenditure is inversely related to the expenditure of the household, the household with the higher expenditure are tend face less health burden as compared to the households with the lower expenditure. This inequality of facing the health care burden has been decreased over the period. As compared to the north-zones all other zones have less chance of facing the health burden.

As study observed that the expenditure quintile is inversely related with the burden of health expenditure the same can be observed with the odds of becoming poor due to the payment of health expenditure. And the households with the higher number of elderly have higher risk of being pushed into poverty as compared to the households with the no elderly. The health care burden on the households has increased over the period.

Health Shock and Coping Strategies in India: Household's Welfare Analysis

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The objective of the study to analyze the coping mechanism adapted to the household with health shock in India. We are using Indian Human development Suvery (IHDS) I & II nationally representative. We have applied fixed effect probit regression model to examine the coping mechanism with health shock in India. The finding of the study revealed that the medical expenses are second position in both the round and it has increased over time. The contribution of money lender has drastically decline whereas friends and relative's contribution has sharply increased in 2011-12 and share of Bank is considerably increased in 2011-12. The number strategies used for the medical expenditure has increased in 2011-12 than 2004-05. From the regression analysis, we finds that income of the household is negatively associated with borrowing form the Employer, money lender, friend, relative, NGO and positively associated with bank and other category. We have also found that female head is positively associated with Employer, money lender but statistically insignificant, friend, NGO is negative and relative is positive, NGO urban place of residence.

Key words: *medical expenses, debt, coping strategies, IHDS.*



A Quantitative Approach to Comparing the Impact of Health Financing on Health Care Services Utilization in India

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Worldwide, the achievement of Universal Health Coverage (UHC) is a major concern for health policy. This Study is mainly focused on Rashtriya Swasthya Suraksha Yojana (RSSY) and State Health Insurance Scheme (SHIS). Therefore, the objective of this paper is to investigate the effect of two basic medical insurance schemes on health services utilization. Data used in this study is obtained from NFHS-4, 2015-16. Coarsened exact matching (CEM), a non-parametric and a monotonic imbalance bounding method has been applied. A weighted variable of CEM was used in Binomial regression analysis to generate estimates to equalize the number of observations within comparison groups. For balance checking, multivariate imbalance measure L1 was used. Since the focus of this study was to examine the impact if health insurance schemes on health service utilization. Along with this to obtain the effect of health insurance on the insured, i.e. the average treatment effect on the treated (ATT) is also estimated. The highest proportion of households covered under health insurance or a health scheme is found in Andhra Pradesh (75 %) and the lowest coverage (less than 5 %) is in Lakshadweep, Manipur, and Jammu & Kashmir. Results found that post matching L1 statistics are all close to 0, as opposed to the pre matching L1 statistics ranging from 0.35 to 0.46. The Final Sample sizes are 11,855 (6.22%) respondents had purchased RSBY, 13,571 (7.12 %) respondents had purchased SHIS. Findings depicts that Irrespective of health insurance status, before matching, the proportion of women reporting at least four antenatal care visits was higher among insured women than uninsured women. ATT reflects that Health insurance coverage under RSBY contributed to increase of 10% ($P < 0.000$), while after matching it reduced to 9% ($P < 0.000$). However, sample of women insured under SHIS contributed almost same before and after matching i.e. 12% ($P < 0.005$). The findings that the SHIS had significantly increased health services utilization but not IFA consumption, and the insignificant effect of RSBY, is consistent with it. Since one of the key aims of expanding the basic health insurance is to improve the health services access, the results from this study seems alarming.



Public and Private Divide in Health Care Spending in India: What Factors Explains the Gap?

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The rising healthcare cost in low-income countries (LIC) got sparked attention during the last decades. The large part of healthcare expenditure is Out of Pocket (OOP) paid by household. The high cost of treatment found to reduce essential household expenditure in low and middle-income countries. The burden of high cost of illness resulting in their catastrophic health expenditure and affect health-seeking behavior with delayed treatment. The objectives of this study are to understand how the hospitalization rate, types of morbidities, health care spending are differential in public and private healthcare facility. And, what factors are explaining the gap between public and private health care facility center?

For the fulfillment of objectives of this study, the nationwide survey NSS's 71st round data has been used for this study. Both Bivariate and multivariate analysis used. The Oaxaca decomposition has applied to explain the gap in the means of healthcare expenditure between public and private facilities.

The result of this study reveals that 62% of the patient used private facilities, while only 38 % used public health services for inpatient care. The percentage among the public healthcare service users is higher for pregnancy-related complications (52%), a disease of respiratory system (42%), infectious and parasitic diseases (42%) and for Injury, poisoning and certain other consequences of external causes (42%). The private facility has preferred for diseases of the genitourinary system (75%). The average cost hospitalization in private hospitals is 3.6 times (INR 7733.9) in public hospitals and (INR 28124.2) in private hospitals) higher than that of public healthcare services. The average cost of the circulatory diseases is much higher in private hospitals (INR 46235.8) than public hospitals (INR 13283.0). The results from multilevel analysis that the Doctors fees (26.9%, $p < 0.001$), Bed charges (21.6%, $p < 0.001$), expenses on medicines (16.5%, $p < 0.001$) are the significant contributors in explaining the difference in mean expenditure in private and public health facility center in India.

This study confirms that the difference in mean expenditure on hospitalization is existed between public and private health facility center in all states and at the national level also. The difference in mean expenditure in public and private is much higher in non-communicable diseases than communicable diseases. The doctor's fees, bed charges, expenses on medicines are major contributing factors which explain the major gap of the mean expenditure between public and private health facility center.

Keywords: *Health expenditure, Out of Pocket (OOP), Public and Private Healthcare*

LECTURE TOPIC:

Propensity Score Methods in Policy Evaluation

Although a randomized control trial (RCT) is considered gold standard for generating evidence on the effectiveness of any policy intervention, RCTs may not be always feasible due to variety of reasons including their prohibitive costs, and ethical issues surrounding possible benefits/harms to the participants. In addition, RCT findings may have limited generalizability because the trial population may often differ substantially from the target population. An alternative to RCTs is an observational study design in which existing databases are used. However, any database analysis is fraught with the risk of different types of biases including selection bias. Propensity score methods have emerged as potent tools in policy evaluation using observational data, and under certain assumptions, these methods can potentially mimic randomized control trials. In this lecture, Dr. Borah will provide a primer on propensity score methods, discuss canned software that can be used to implement these methods, and demonstrate their use with specific policy evaluation examples.

Need For Preventive Health Care in Knowledge Industries: A Case Study on Information Technology Employees In India

Nausheen Nizami

Workers are the backbone of an industry as well as an economy. Accelerating growth requires ensuring, understanding and managing life of workers when they are at work. This paper analyses the meaning and importance of good health among IT employees based on the findings of an empirical survey. IT industry has been chosen as it apparently offers highly remunerative packages but compromises on some of the essentials of decent work. One of the dimensions of decent work is safe work. Lack of safety in IT industry is less in terms of the infrastructural issues and more in terms of emotional stress owing to work-related reasons. Hence in the context of IT industry, safe work implies absence of work-induced health problems. In this paper, work safety has been measured on the basis of rudimentary statistical tools and non-parametric tests.

Primary data collected from 272 IT employees by using snowball sampling technique and a well-designed questionnaire have been used for developing Safe work Index (SWI)

on the lines of decent work agenda of the International Labour Office. Safe work Index is an indicator of current health status of IT employees. The paper also discusses the various policies being adopted by IT Companies to distress their employees and discusses their effectiveness. Findings reveal deficit of safe work in IT companies and deteriorating health status of IT employees which has implications for the social health of the nation. The nature of work in IT industry which requires longer hours at work, constant sitting posture and working on computer screens has started playing havoc among the employees of younger age group and calls for attention for provision of decent ergonomic furniture and timely breaks from a sitting posture. Findings reveal high stress levels and a number of health problems among IT employees. The nature of work, work environment and work-pressures are directly linked to the health of knowledge workers. The paper concludes with suggestive measures for the same.

Key words: *Preventive healthcare, safe work, decent work, IT industry, knowledge workers*



Understanding Maternal and Child Health on a Continuum: Major Determinants of Continuum of Care In Maternal and Child Health Services Utilisation in India

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Continuum of Care (CoC) in Reproductive, Maternal, Newborn and Child health services (RMNCH) utilisation has been recommended in recent global health reports to further reduce maternal and child mortality. A lack of quality and continuum of care in RMNCH services in developing countries like India reported as the major challenge to reach SDG-3 by 2030. Therefore, this paper investigates to identify the major determinants of dropout from CoC in RMNCH services. We used a nationally represented sample of 2,59,627 ever-married women who gave birth in the last five years from the fourth round of National Family Health Survey (2015-2016). Continuity in utilisation of maternal and child health care services declined persistently from pregnancy registration (85%), receiving MCP card (56%), going for at least four antenatal care (ANC) visits (32%), delivering in institutional facility (30%), seeking postnatal care (PNC) for mother

(25%), then child up to full immunisation (reduced to 14%). The quality of care was the strongest predictor factor of CoC. The likelihood of seeking ANC, institutional delivery and post-natal care is five to nine times higher as the quality of care improves. Among other socioeconomic factors, economic and educational status of women and region of residence, spacing and limiting of births have a significant effect on CoC in RMNCH services utilisation. Improving quality of care alongside right planning of births and socioeconomic empowerment of women is important for enhancing CoC in RMNCH services utilisation.

Keywords: *Continuum of care, quality of care, health services utilisation, maternal and child health, India*



Health Adjusted Life Expectancy in Tamil Nadu

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Increasing Life expectancy (LE) and decreasing death rates are positive signs of health status.

Health Adjusted Life Expectancy (HALE), an index adjusting morbidity with LE shows the expected healthy years in the expected lifespan of an individual. The pioneer study on Disability Free Life Expectancy in India used the National Sample Survey (NSS) 60th round, 2004 data for analysis (Benson, et al., 2014). This study attempts to estimate the health status combining morbidity and mortality using NSS 71st round (2014) data to provide an overview on the health status of the population in Tamil Nadu. Tamil Nadu is a high performing state in terms of health indicators. As per SRS Bulletin 2016 among the major states/UTs, Tamil Nadu ranks 'second lowest' in infant mortality rate and under-five mortality rate, 'third lowest' in birth rate but 'twelfth lowest' in death rate. A mismatch is noticed among the health status indicators in the state. The study explores the intricacies in the health status of the population in the state combining mortality (2012-2016) with morbidity (2014). Abridged life tables are constructed across sex and place of residence separately using the average of Age Specific Death Rates from 2012-2016. Details on morbidity are collected from the unit level data of NSS. The three

levels of ailment morbidity, restricted activity and confined to bed are considered for construction of HALE. Computation is made for age at birth, at 15 years (young adults), at 40 years (adults), at 60 years (elderly onset) and at 80 years (elderly). High LE confirms negative association with HALE due to dominance of chronic illness. At age 60 the loss of expected healthy life years is 40 percent. This emphasises the need for more geriatric care and special care of children especially to grandmothers. The morbidity encompassed HALE is high in rural regions compared to urban. Besides the fact that relatively more health care facilities are available in urban areas, the urban folks are known to suffer from poor health which reiterates the spill over of urbanisation. As the intensity of illness increases, suffering rate declines. This may be due to availability of health care services that enables immediate health care seeking in times of need. A planned complete health care system with preventive, promotive, curative and restorative measures will transform the increased longevity into a resourceful force to the nation.



Measles Vaccination coverage among the children of Northeastern States, India: A Spatial and Decomposition Analysis

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Measles is a highly contagious viral disease which remains a major cause of death among young children globally, despite the availability of a safe and effective vaccine. It is among the major cause of child death which can be prevented by a vaccine. Despite immunization interventions taken up by governmental and non-governmental organizations, NFHS-4 assessed measles vaccination coverage in Northeastern states, India holds 68.3% coverage which is much lower than the 95% coverage level required for elimination. The region is physically isolated from the rest of the country due to mountain terrains & poor infrastructure and also inhabited by numerous tribal and ethnic groups with diverse socio-cultural practices. This paper attempts to identify socio-economic factors and to quantify their contributions in generating inequalities and explore the spatial pattern of measles vaccination coverage across different geographical areas of Northeast states.

The data used in this study has been taken from the National Family Health Survey (NFHS-4). Binary logistic regression and decomposition statistical techniques were used to quantify and explain the degrees of socio-economic inequality. Spatial analysis conducted through Moran's-I was applied to analyze the spatial patterns in vaccination coverage across the districts and identify those areas with statistically significant clustering of high and low values, as well as spatial outliers.

The results of concentration index decomposition revealed that wealth factor made the largest contribution (50.8%) to socio-economic inequality in measles vaccination coverage. Religion (21.6%), mother's education (17.6%) and birth order (8.5%) were found to be important contributions to this inequality. Through spatial analysis, striking variation in measles vaccination coverage was observed among the Northeastern States. The lowest percentage was observed in the East Kmong district of Arunachal Pradesh and the highest in three districts of Sikkim. The Moran's-I value (0.261) shows a non-significant positive spatial auto-correlation at the district level.

To improve the immunization coverage and to reduce the socio-economic inequalities in the Northeastern states, focus must be channeled to the vulnerable sections of the society and regions where the actual reach of health programs are poor. The poor households need to be uplifted through income-generating programs and policies. Programs and policymakers should shift their concern from achieving 'average' lower vaccination coverage to 'distribution' of the schemes to needy sections of the society.

Keywords: Child health, Concentration index, Decomposition, Measles vaccination, Moran's I, Northeastern states, Socio-economic inequality



Parental migration and its effect on children's health status and access to health care services in India

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Mobility of population is one of the leading issues of 21st century estimating about 1 million population moving both internally and internationally. Since 1980's India has experienced an unprecedented level of migration with the volume of migration rising from 314.5 million in 2001 to 453.6 million in 2011. During this process, different aspects of children may suffer from the disruption caused to their family life, access to health care and education. Furthermore, the well-being of children depends on whether they are being accompanied by their mother or not. Migration of father and mother differently affects the health and education of children accompanied or left behind. Set to this above context the present study tries to assess the relationship between parental migration and its effect on child health (0-14 years). The study examines how migration affects children's access to healthcare services and if there exists gender gap in health status and health care access among children based on parental migration status. It is evident from the result that parent migration status plays a role in influencing the prevalence of common childhood illness and malnutrition among children. Left behind children are at a higher risk of suffering from ARI i.e. 43.16% (even higher than average Indian standard i.e. 25%), and diarrhoea (5.82 %) during fifteen days prior to the survey, though both are seasonal. Children of non-migrants are more underweight (18.84%) and overweight (18.43%) than the children of migrants and left behind. Consumption of junk foods may be one of the reasons behind this. Left behind girls is found more to be underweight as well as overweight than boys. Moreover, utilization of health services is found more among left behind boys than that of girls. Low educational level of parents, housing materials, poor hygiene practices (such as, defecating in the open or taking temporary latrine), using fire wood for cooking were significantly associated with children being more prone to diarrhoea and ARI. Furthermore, the risk of being malnourished increases significantly with low educational status of mother, improper food intake etc. In order to succeed in the reduction of child malnutrition in the India, multi-pronged strategies are required towards developing and implementing comprehensive nutrition-education programme for child care to improve child's dietary habits apart from providing nutritional supplementation and overall socio-economic development of the underserved and unserved.



Decomposing Socio-Economic Inequality in the Utilization of Maternal Health Services in India, 2005-16

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The gap in access and utilize to maternal health care services is a big challenge for India. Health and socio-economic advancements are so closely intertwined that it is impossible to achieve one without the other. According to the WHO, Globally, about 800 women die every day of preventable causes related to pregnancy and childbirth; 20 per cent of these women are from India. Using secondary data from National Family Health Survey (NFHS-3, 2005-06, and NFHS-4, 2015-16), this study quantifies the extent of the relative contribution of socio-economic factors to the inequality in full antenatal care, skilled attendants at birth, and postnatal care in India and its states over time. This study applied Wagstaff decomposition analysis, and CI estimates to quantify the extent of relative contribution to the inequality in maternal health care services in India and its states during 2005-16. The outcome variables are Full antenatal care, skilled attendants at birth and postnatal care. Place of residence, age of women, Birth order, women's education, caste, religion, and wealth index are used as explanatory variables. This paper will present coverage of full antenatal care, skilled attendants at birth, and postnatal care in India and quantifies the extent of the relative contribution of socio-economic factors to the inequality in maternal health care utilization in India and its states. Results of the concentration curve portray considerable reduction in inequality among both indicators, and inequality has reduced much more in the utilization of skilled attendants at berth as compared to full antenatal care over time.

Results of decomposition analysis reveal that place of residence, age, birth order, education, religion, and caste are most critical factors contributing and explaining maximum inequality in the utilization of full antenatal care, skilled attendants at birth, and postnatal care services among women in India during 2005-16 in Table 1. The reduction of contribution of place of residence (-41.9% to -58.1%), age (28.7% to 26.5%), and caste (10.1% to 3.0%) in full antenatal care utilization during 2005-06. However, the contribution of education to the inequality has increased from (28.8% to 38.6%) in full antenatal care throughout the period. Results show that contribution of place of residence (-140% to -38.9%), birth order (-74.7% to -35.8%), education (59.7% to 45.8%) has significantly declined during 2005-16. Similar kind of trend can be seen in the postnatal services.



Socioeconomic Inequality in Healthcare Utilisation in India: Is Health Insurance a way out?

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Over the last decade, the government of India has been emphasising on universal access to health care through various health programs and policies. Notwithstanding an improvement is there, access to health care is assumed to be still inequitable and unfavourable towards the socioeconomically marginalised group. Such differentials are evident from differential performance of health outcome indicators that reflect the health status of people across socioeconomic group. An assessment of inequality in health and health care utilization would provide guidance in identifying the points of policy intervention that can reduce the inequity in healthcare utilisation. Studies so far have been addressed inequalities in health either through health outcomes and identifying the factors with limited emphasis on the quantifying the contribution of socioeconomic factors to overall inequality. The role of financial protection schemes in tackling such inequalities also remains unanswered.

Using National Sample survey (2014-15) data, the present study measure socioeconomic inequalities in healthcare utilisation and the role of health insurance in addressing such inequalities. Concentration Index(CI) was calculated as a measure of socioeconomic inequalities in health and contribution of the determinants to inequality was assessed by the decomposition method. Of all the factors that upshot inequality, the economic situation of an individual has strongly determined their healthcare utilisation. Further, the burden of healthcare expenditure found to be significantly higher among the poor. Health insurance though found to be a key factor in promoting health care utilisation, however, the economic differential still exists with a disproportionate burden of expenditure among the poor. The study thus finds health care utilisation in India is pro-rich and publicly funded insurance schemes were not effective in tackling the economic inequalities in health care utilisation. Economic differences and fewer benefits from medical insurance appear to contribute pro-rich inequity in health care utilisation. This challenges the efficacy of publicly funded insurance programs in addressing the equity aspects of healthcare utilisation.

Home to growing and changing population with diversified characteristics, insurance alone is not a respite to plague the public health system in India. The ultimate goal of any public health system is to increase access and provide affordable care to everyone. Assessing the performance of health system by prioritizing the required adjustments along with emphasis on the equity implications of financial protection measure is important for universal healthcare access.

Decomposing of socio-economic health inequality in utilisation of delivery care services in Uttar Pradesh

Renu

Utilization of maternity care services directly and indirectly affect morbidity and mortality of women and child. According to UNICEF about 800 women die every day of preventable causes related to pregnancy and childbirth in the world; 20 per cent of these women are from India. It is estimated that 44,000 women die per year due to preventable pregnancy-related causes in India. At present, one-fourth women of Uttar Pradesh gives birth at home (non-SBAs) which may trigger maternal morbidity and mortality. Apart of that several demographic, socioeconomic and cultural factors influence the utilization of delivery care services (singh, et al, 2012). In India, Uttar Pradesh has accounted highest maternal mortality rate in the country; 258 maternal deaths on every 100,000 live births in 2012-13. Uttar Pradesh is growing with annual population growth rate of 16.5 per cent. Low literacy among population, inadequate availability of health infrastructure and resources along with huge socio economic inequality and lower level of utilisation of delivery care services is the major reasons behind the high MMR in the Uttar Pradesh (Jat et al. 2011). It is far-reaching to understand trends and regional dimensions of socioeconomic inequalities in maternal health care across rural-urban, regional pattern and socio-demographic features in Uttar Pradesh. Therefore, the present study is an endeavour to examine the socioeconomic inequalities in the utilisation of delivery care in Uttar Pradesh.

This paper describes the changes in socio-economic gradient in utilization of institutional delivery care services in Uttar Pradesh. Also, see the trend in the choice of service provider across different socio economic groups in between the years 2004 (pre-NRHM) and (post implementation of NRHM). The study mainly conduct the major determinates of the maternity care services such as institutional delivery, public and private delivery, antenatal etc. The data for the purpose of the present study have been taken from the National Family Health survey 2015-16 (NFHS-4). The study adopted concentration index (CI) and decomposition methods to analysing health inequality in utilising delivery care services among women from disadvantage group of Uttar Pradesh. This study analysed that after NHM the inequality in utilization delivery care services in decreased significantly at public as well as private facilities. However, the concentration index shoes that the utilization of delivery care at public facilities are more among women from lowest wealth quintile as compare to highest wealth quintile. Similarly, other socio-economic factors such as women education and occupation status of women significantly improve maternal health and decreasing inequality in utilization of delivery care services.

Key Variables: *institutional delivery, wealth quintile, public delivery, maternal mortality rate, maternal health*

Effect of Healthcare Spending on Economic Inequalities in India

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Health is one of the most important and decisive factor in the overall socio-economic development of any nation. It has been seen that health expenditure is gradually increasing over the past years in India and it is being forecasted that in future the trend will follow an increasing pattern. More than three-quarters of health spending in India is paid by household. Main objective of this paper is to determine the extent of various economic inequality in consumption expenditure before and after accounting for healthcare spending in major states of India. The evidences are drawn from the unit-level records of consumption expenditure survey (CES) 68th (2011–2012) round, conducted during July 2011–June 2012 by National Sample Survey Organization (NSSO), Government of India. To get inequality effect on consumption basket, inequality measures has been computed once by excluding health expenditure and then by including it.

Rural urban inequality in health spending share does exist and in rural area the level of inequality is much higher than urban areas. The richer section in rural areas constitutes higher share and health spending is concentrated more for this section. From concentration index, it has been seen that household health spending is very much concentrated to the richer section of the population in West Bengal, followed by Uttar Pradesh and Tamil Nadu. States like West Bengal, Jammu Kashmir, Gujarat, and Tamil Nadu have highest relative change in Gini index in consumption expenditure after accounting for health spending. But in case of Kerala, Rajasthan and Haryana, the trend is reverse i.e. inequality increases for these states after excluding health spending. All states have undergone positive relative change after accounting for health spending except Chhattisgarh. West Bengal has the highest relative change (5.45%) in percentile ratio. In case of Theil's T and Atkinson's index, Jammu Kashmir constitutes highest relative change.

Too little is known about the relative importance of inequalities in the determinants of health and health service utilization. Inequalities in health, and most probably in service utilization, very largely reflect inequalities in variables at the individual and household levels, such as education, income, location, and housing characteristics. This indicates that policies aimed at combating health sector inequalities should aim to reduce both demand as well as supply sides inequalities and more research needs to be done in order to understand the nature of inequality associated with health care spending.



Regional Disparity of Healthcare Infrastructure: Emergence, Growth & Transformation of Philanthropic Initiatives in Kerala

Sajid M S

Kerala is a well renowned state in its social development indicators and ranked at top compared to other Indian states. It is a paradox that the state achieved all levels of social development at low economic growth rate. However the development issues are not unique in the state as other backward regions facing in India. Regional disparities between North and South regions of the state of Kerala have emerged long back and persist till the date. Based on the geographical and demographic demands, the availability of public institutions across the regions is not at adequate level as a result the inclusive development is under threat. Literature indicates that North region is more backward than South in terms of public healthcare infrastructure (Kabir&Krisnan,1991; HDR,2005; DHS,2011 Jacob,2014).

Data shows that the North region is facing shortage of health centres (like PHC, CHC and Medical College), human resources (like medical officers, ASHA workers, ANM's) and infrastructure like hospital beds. Interregional inequities in provisioning of public institutions conduced in the emergence of philanthropic initiatives in Kerala especially in the North region. The philanthropic initiatives have had a due share in achieving the title 'Kerala Model of Development' by serving the oppressed caste groups. Exclusion of different vulnerable groups from the 'Kerala model of development' is more or less studied. But what changes have occurred to philanthropic initiatives par with the global changes is least addressed. The paper proposes emergence of the initiative is a concomitant consequence of the regional disparity and social exclusion in the state. It has undergone socio political transformation in post 90's. As a result accessibility and affordability of the services at the initiatives will be a growing concern to the vulnerable groups after the transformation. Hence the unavailability of public institutions and profit oriented transformation of philanthropic initiatives will produce a double burden to state's development plans.

To understand the regional disparity in public health resources and healthcare infrastructure between North and South districts of Kerala

To trace the emergence and growth of philanthropic initiatives rendering healthcare services in Kerala

To study the social-political transformation of philanthropic initiatives rendering healthcare services

The study contains qualitative and quantitative methods hence a mixed method has

been followed in the study. The qualitative data was retrieved from archives, former studies and other government reports. Quantitative data was collected from the selected philanthropic initiatives during the fieldwork in 2015. A variety of philanthropic initiatives from the North region based on the working experience and healthcare delivery has been purposively selected for the study. Healthcare seekers, providers and officers of the selected initiatives were interviewed by using an interview schedule and interview guide respectively. It helped the researcher to understand the past and present of the initiative from which the inferences has been made.

Absolute inequalities were found in accessing the healthcare services provided by the various initiatives. Every fourth patient is facing out of pocket expenditure from the tertiary care initiatives. Small initiatives have been transformed into bigger initiatives and accumulated vast assets over this period. Post 90's had marked with the transformation and it has socio political reasons at various layers.



Spatial Analysis to Examine the Effects of Lifestyle and Dietary Behaviour on Diabetes among People of Kerala

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Diabetes is a global health problem which is chronic and noncommunicable. It is estimated that there are about 20-crore diabetic patients in the world. Type-1 diabetes is caused by genetic disorders and that of type-2 occurs due to ageing and irregular lifestyles. At present, around 90 percent of diabetes patients in the world are affected by Type 2 diabetes. According to report, Kerala is the diabetes capital of India. Irregular lifestyle and bad food habits are identified as major causes of diabetes. This paper explores how lifestyle and dietary behaviour correlates with diabetes among people of Kerala from a spatial perspective. To fulfil our objective, we analysed NFHS-4 data. The analysis tells us that there exists a positive auto-correlation and clustering in the

prevalence of diabetes among people who smokes and drinks because the Moran's-I is 0.176 and 0.073 respectively. Bivariate LISA Cluster maps are obtained associating diabetes with dietary behaviours. We observe that the district Idukki has low-high spatial clustering and Pathanamthitta has high-low spatial clustering with regard to daily consumption of fruits. Again, the district Alappuzha has high-high spatial clustering with daily consumption of non-veg food. Pathanamthitta has a high-low clustering with daily consumption of vegetables and high-high clustering with smoking. There is a negative auto-correlation between diabetes and daily consumption of aerated drinks, fried food, fruits, non-vegetarian and positive auto-correlation between diabetes and people who never consume fruits, non-veg as suggested by the Moran's-I values. We see that the districts Malappuram and Idukki are significantly associated with daily consumption of aerated drinks; the district Kasargod is significantly associated with daily consumption of fried food, Idukki and Pathanamthitta are significantly associated with daily consumption of fruits, Alappuzha and Ernakulam are significantly associated with daily consumption of non-veg and Pathanamthitta is significantly associated with smoking.



Health sector human resource planning for Kerala: Methodology for development of a checklist for prioritization for new courses under Kerala Health University: A novel experience.

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Human resource is the most important investment in health sector. Planning of human resources means activities intended to project current and future human resource needs. Kerala state is unique for the achievements in health especially reduced mortality rates and better human development index. Kerala is considered as the supplier of health care providers, including doctors and nurses for all regions of the world. Currently there are 26,238 MBBS degree holders and every year another 3550 is being added to this number. Do we need additional MBBS seats or not for the state is the question. In order to answer this an evidence based, objective, simple and user-friendly checklist needed to be developed as a decision making tool for the use while processing the applications.

Methods: Qualitative methods were used for identifying the priority domains and quantitative methods were used for priority ranking. An affiliated institution is considered as a unit of the study. The sampling frame consisted of 31 Medical colleges in the state.

Results: The domains identified by the FGDs were: (1) Geographical and regional considerations (2) Established track record and credibility of the institution as indicator of quality of performance (3) Availability of patients, and clinical material (4) Local disease epidemiology (5) Non availability of similar course or institution in the same district or within 20-50 Kms: and (6) Placement opportunity or demand after successful completion of the course

Prioritization on these domains was done semi-quantitatively using a priority grid exercise using rank and scale method. Kruskal-Wallis test was done to test the difference between median rankings of each domains and this was found to be significant. The weights obtained from this priority rankings was transformed in to categories of excellent, good, satisfactory, mediocre and poor based on which decision for immediate acceptance, pending decision or rejection can be undertaken by the final deciding authority.

Conclusion: The KUHS Score card,(final validation is now going on) , a user friendly, electronic platform, based on scientific objective scoring, for prioritization of an application for new college or course is the final outcome.



Cereal Consumption Diversity and Type 2 Diabetes: An Association in Kerala

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India has around sixty million persons affected by diabetes. The numbers are estimated to rise to 98 million by 2030. In the next 20 years, nearly one-fifth of the world's diabetic population will be in India. India is on the way to becoming diabetic capital and such high level of prevalence faces several major challenges in the prevention of Type 2 Diabetes Mellitus. Indian regional and national studies estimate that the condition affects between 9% and 20% of the adult population with India's southernmost state of Kerala, having

the highest prevalence of T2DM (at least 20%) of NCDs in total disease burden at the state level. Out of twenty-nine states, seventeen states have diabetes as one of the 15 main causes of total disease burden. Kerala ranks first with 74.60% share of NCDs in total disease burden experiencing highest epidemiological transition level (ETL). In India, diabetes which is mostly attributed to rapid lifestyle transitions, diet transitions and by a narrowing in the urban-rural divide in living conditions. Few studies for developing and no one for India (especially for Kerala) have come on association diet diversity and Type 2 Diabetes. This paper discusses the association between cereal consumption diversity and Diabetes (one of Non Communicable disease) in seventeen states; especially it examines the link between the diversity in consumption of cereals and prevalence of diabetes in districts of Kerala (highest NCD burden). Mostly all the districts in Kerala have a very low value of Simpson Index(S), which reflects low cereal consumption diversity which is one of the main cause to highest share of Dietary risk and the second highest share of fasting plasma glucose(FPG) to total disease burden (DALYs) in 2016. This calls for a change in food policy as a preventive strategy not to focus only on rice and wheat but a diverse cereal basket. It needs a promotion among consumers for the inclusion of coarse cereals in consumption basket as we consumed in past and need focus on production aspect as well. Food policy may play a vital role in the prevention of Diabetes Type II along with Health Policy.

Keywords: *Diabetes, Diet Diversity, Nutrition, Food Policy and Non-Communicable Diseases*



Developments and Emerging Issues in Public and Private Health Care System in Kerala: A Study.

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Kerala is a moderately urbanized state with 26% of its population living in urban areas. Kerala is known for its achievements in health despite slow economic growth and low per capita income. Kerala was universally recognized for its good health indicators. Even before independence the specific policies, efforts and expenditure for health by the Maharajas of Travancore and Cochin was remarkable. The unswerving governmental support for the welfare sectors till the mid 1980s served as a catalyst for the development

of health services in Kerala. . During the periods between 1960s to mid 1980s there was an increase in the public sector institutions. But thereafter the pace of growth of public health care system slowed this decline was made good by the private medical care setup which makes Kerala one of the state with the highest reductions in public health sector contributions. In many studies the state of Kerala is projected as a „Model State“ for development by many scholars in the national and international level. Health care is the prevention, treatment, and management of illness and the preservation of mental and physical well-being through the services offered by the medical and allied health professions. According to the World Health Organization (WHO), a well functioning health care system requires a robust financing mechanism, well-trained and adequately-paid workforce, reliable information on which to base decisions and policies, and well maintained facilities and logistics to deliver quality medicines and technologies. In India health is a state subject. The growth and development of the public health sector depends very much on the budgetary allocation and other supports by the state government. Public Health Care System of Kerala state was formed in November 1956, merging the former princely states of Travancore and Cochin with Malabar district ruled by the British prior to Independence. Kerala health system was once advocated as the ideal – ‘Good Health at Low cost’ model. According to National Family Health Survey (NFHS) India 199899, Shown the quality of services received at government and private health facility. In that survey respondents said that they received the services for which they visited the facility. The median waiting time to receive services was 30 minutes overall, but was almost twice as high at public facilities (59 minutes) as at private – sector/NGO/ trust facilities (30 minutes). So this paper focuses on Developments and Emerging Issues in Public and Private Health Care System in Kerala: A Study.



Too Much Care? Private Health Care Sector and Surgical Interventions During Childbirth in India

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This paper evaluates the role of the private sector in performing one of the common surgical interventions, i.e. caesarean sections during childbirth in India. We use the latest round of National Family Health Survey to estimate the differential probability of C-section in private medical facilities relative to government facilities. We employ two estimation techniques, Household Fixed Effects and Coarsened Exact Matching, to reduce the extent of selection bias in the choice of delivery location. We also take advantage of a new question introduced in the survey which allows identification of planned C-sections which are more likely to be the result of either demand for C-section or unobservable (in the data) medical risks. We find that the probability of an unplanned C-section is 13.5-14 percentage points higher in the private sector. Given that some of the planned C-sections could be a result of supplier-induced demand, this is a very conservative estimate. These results therefore call for a critical assessment of the role of private sector in healthcare in the context of inadequate public provision, expanding private provision and weak governance structures.



Variation in extent of caesarean delivery and associated cost in India: Who is lagging behind?

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Rising share of caesarean rate (CS) has been a public health concern in many developing country including India. The rising trend of caesarean delivery raises the apprehension regarding greater access to delivery care for one and all across the socio-economic spectrum and this emergency obstetric procedure being accessible to those in need more than those who afford. This study is an attempt to understand the extent the caesarean delivery, its associated cost and variation among the states in India. Data from the recently conducted National Family Health Survey 4 (2015-16) was used in the analyses. Descriptive statistics were used to understand the level of CS rate and out of pocket expenditure (OOPE) whereas absolute difference methods, ratio methods and concentration index was used to understand the equity in access.

The caesareans rate varies substantially across the regions of India. There is a tendency of greater access to this procedure among the rich even in regions with limited/infrequent access to this procedure. It is evident based on the pattern of CS rate displayed according to mothers' educational level with an exception of the Sothern region, uneducated, poor mothers are less likely to use this surgical intervention in all region. The OOPE was US\$365 for the caesarean births in a private health centre in India, US\$94 for the caesarean birth in a public health centre, US\$160 for the non-caesarean birth in a private health centre and US\$30 for the non-caesarean birth in a public health centre which varies from region to region. The inter-region variations in OOPE of institutional delivery in each of the four distinct categories are large. The OOPE of caesarean births in public health centres of southern was US\$81 compared to US\$145 in north-eastern region. For mothers who avail themselves of institutional births in public health centres, 26 percent of OOPE was in medicine, 13 percent each on hospital stay and transport, 11 percent on test and 36 percent on others. In the case of institutional births in private health centres, 34 percent spent on hospital stay, 19 percent on medicine, 16 percent on test 9 percent on transport and 22 percent on others. The study found Economic costs associated with caesarean births are huge to families, households and the nation. Generating awareness among the public about the adverse consequences of caesarean births through mass media, strict monitoring of caesarean births and regulating private health centres performing caesarean delivery and sensitizing health professionals to use caesarean births is required to decline the trend.

The Progression of Domestic Violence from Generation to Generation and Its Impact on the Reproductive Health of Women: An Analysis of Gujarat

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Domestic violence includes any form of violence suffered by a person from a biological relative, but typically is the violence suffered by a woman by male members of her family or relatives (Martin et al., 1999). Domestic violence includes any form of sexual, physical or emotional violence. Violence in the family of origin has emerged as an especially powerful risk factor for partner aggression by men (World Report on violence and health, 2002). Although men who physically abuse their wives have frequently have violence in their background, not all boys who witness or suffer abuse grow up to be abusers themselves (Caeser P., 1998).

In this paper we examine if the reproductive health of women during pregnancy is affected if she has or had undergone domestic violence of any form.

Here we intend to find if the history of domestic violence in the family has a negative or positive impact on a couple within wedlock.

Data source used in this paper is the 4th round of the National Family Health Survey (NFHS-15-16). The Individual file of NFHS-4 has been used for this paper after filtering out the cases of Gujarat. A case-control odds ratio analysis followed with a chi-square test were used taking the number of ANC check-ups as dependent variable and Domestic violence as an independent variable. Similarly we take Domestic violence as a dependent variable and Family history of domestic violence as independent variable using the same method. H0: “odds of getting adequate number of ANC visits are the same for women who face domestic violence and those who do not face domestic violence” is rejected at 5% level of significance. Data shows that the odds of women who face domestic violence, getting inadequate number of ANC visits are 2.08 times higher than women who are free from domestic violence. H0: “odds of a person with a family history of domestic violence, abusing his wife are the same as a person who has no history” is rejected at 5% level of significance. The odds of a person with a family history abusing his wife are 1.81 times higher than those who have no history.

Keywords: *Family History of Domestic Violence, Antenatal Care visits, Alcohol Consumption*



Differences in Repeated Caesarean Deliveries Rates between Public and Private Health Care Facilities: A Study on Successive Births in India

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A caesarean delivery, also called C-section, is a surgical procedure in which a foetus is delivered through an incision in the mother's abdomen and uterus. The maternal and neonatal deaths have significantly come down in the last century in large part as a result of the increased application of technology during labour and childbirth and surgical deliveries play an important role in that. Although C-section can be life saving for mother and child both in certain situation but the overuse of the medical technology for profit motive or risk-avoiding in health care facilities is a concerning issue. Currently, 19% of all births are occurring by caesarean section globally, which is higher than recommended level of 5-15 % of C-section deliveries by WHO. The present work is a study on repeated caesarean among successive births in India. As per the objective distribution of repeated caesarean deliveries across states of India is estimated using bi-variate analysis. A multinomial logistic regression model was used to identify the contributory characteristics on the likelihood of choosing a place to deliver the two successive babies by controlling the place of delivery and then results are presented as predicted probabilities to avoid the complexity in interpretation. Among the 53,599 women who had two children age, place of residence, religion, wealth index, education level of women, category are some significant factors affecting the choice of women regarding the place of delivery. In private health care institutions repeated caesarean area more prominent as compared to public health care institutions, which is an issue of big concern for government regarding their health care delivery system.

Key words: *Repeated caesarean delivery, successive births, multinomial logistic regression, predicted probabilities.*



Intimate Partner Violence during Pregnancy and Its Effect on Quality of Antenatal Care and Related Expenditure

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Intimate partner violence (IPV) has been recognized as a widespread problem. It is more devastating and has adverse health consequences during pregnancy both for mother and foetus. Globally, the occurrence of IPV against pregnant women varies extensively. In India, in spite of the fact that it is under reported, prevalence of different forms of IPV against women of reproductive age is quite high. The studies reporting the consequences of violence during pregnancy on receipt of quality ANC and determining ANC expenditure is limited in developing countries, particularly for South Asian countries and India, where the levels IPV is high and quality of ANCs is poor. The objective of this study is to investigate the prevalence of IPV against pregnant women and its effect on the receipt of quality ANC and its related expenditure.

For this study, we have used information collected from 504 pregnant women who are systematically sampled from Integrated Child Development Scheme (ICDS) Register of pregnant women in selected villages and urban slums of Uttar-Pradesh as a part of longitudinal study.

The results suggest 9.7% of women reported IPV during pregnancy which is higher than the global level and also more than all India average (3.9%) estimated from NFHS-4. The factors like family type, women's education, partner's occupation and sex of the last child emerges as significant factors in predicting the chance of IPV. Further, results show support from the partner largely determines the condition and status of the women within the household so the receipts of quality ANC, since majority of the respondents were housewives. Women who faced violence (28.57%) have lesser number of four plus ANC than those who did not face any violence (13.86%). Similarly, the percentage of women with no ANC visits is higher for those who reported their pregnancy as unwanted for both the husband and her life partner (30.77%) than those who were reported pregnancy as wanted by both of them (15.27%). Spending on ANC is higher for those whose partner and respondent both wanted the pregnancy (Rs.528.9) than those who did not want (Rs.444.85). Women those who have faced violence during current pregnancy spent more (Rs. 541.10) than who did not face (Rs. 452.31).



A Multilevel Analysis on the Association of STI and Genital Ulcer among Women with Number of Sex Partners

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Sexually transmitted infections (STI) are infections that are commonly spread by sexual activity, especially vaginal intercourse, anal sex and oral sex.” On the other hand, “a genital ulcer is located on the genital area, usually caused by sexually transmitted diseases such as genital herpes, syphilis, chancroid, or Chlamydia trachomatis.” These are associated with increased transmission of HIV, and poor reproductive and sexual health. These diseases are more dynamic than other infections prevailing in the community and it is important to acknowledge and keep track of these diseases in a vast and populous developing country like India, particularly in this HIV era. According to research reports, young people (male and females) who have sex with multiple partners or have sex with a partner that has many sexual partners, and gay and bisexual men are at a greater risk to have STI than others. In this paper, we critically examine the association of STI and Genital Ulcer with number of sexual partners at State and District level of India. The basic objective of this study is to study the how women who has STI and genital ulcer in the past one year, during the NFHS-4 2015-16, related with their total number of sex partners. To fulfil our objective, we took help from the fourth round of the National Family Health Survey (NFHS), a large-scale survey conducted during the period 2015-16 under the supervision of the Ministry of Health and Family welfare (MOHFW), where the International Institute for Population Sciences (IIPS) Mumbai served as the nodal agency. The women’s file of NFHS-4 has been specifically used for the analysis. A case-control odds ratio analysis and a multi-level mixed effects logistic regression analysis has been done taking whether the women had STI or not and also whether she had genital ulcer or not as the dependent variables. The total number of sex partners has been treated has the independent variable and also the exposed variable. A spatial analysis is carried out to check the distribution of these women at state level as well as district level. From the spatial analysis it is found that mainly in the states of Haryana, Punjab and Goa there is more prevalence of STI. The case-control study suggests that the odds of developing STI among women who are exposed i.e. having more sex partners is 6.45times more than women who are unexposed. Similarly, the odds of developing genital ulcer is 5.87times more for the exposed women. The multi-level analysis at state level and district level both shows that as the number of sex partners increases by one unit, on an average the odds of developing STI increases by 6 times.



Provision of DOTS by a Family Member to Prevent Treatment Default in Tribal and Hard to Reach Areas in the State of Chhattisgarh, India: An Implementation Research Study

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Dr. Arti Borkar, Shashank Gupta, Anupam Nahak**

Tuberculosis (TB) remains a worldwide healthcare problem and it is one of the major health concerns in India including Chhattisgarh state. Globally, the burden of tuberculosis (TB) is estimated to be highest in Asian countries (1).

As per RNTCP guideline in India, DOTS is the key strategy for the control and treatment of the TB patients(1). But this has been a challenge to implement in the state. One of the studies conducted in Raipur district from November 2011 to October 2012 suggested that only 13.2% of the DOTS centres properly implemented DOTS strategy. It may be one of the reasons that there is a low treatment success especially in the tribal district. State is witnessing an increasing trend in the number of Multi-Drug Resistant Tuberculosis (MDR-TB). This implementation research was aimed to examine the effect of family DOTS on adherence to TB treatment among new smear positive sputum , new smear negative and extra pulmonary TB patients to minimize treatment non-adherence in a Left Wing Extremism (LWE) affected district in Chhattisgarh, India.

A prospective cohort study of all new smear positive sputum, new smear negative sputum and extra-pulmonary TB patients who were newly diagnosed and registered for treatment under the RNTCP was implemented between November 2016 to January 2018. They were followed till the completion of the treatment. It was implemented in one of the hard to reach districts. The aim of study was to evaluate outcome of family DOTS in relation to conversion rate and treatment success rate; feasibility and acceptability of family DOTS by TB patients and their families.

Family DOTS in term of Sputum conversion rate is not inferior to the standard DOTS as study result indicated (Intervention group - 94% Comparison group-95%). However the difference is statistically not significant. The treatment success rate in the comparison group was better (72.41%) compared to the intervention group (68.35%). Similar results have been observed in terms of default and death rate. The result may have been impacted by other factors as in one particular block the default and death proportions are highest ((Non-adherence -19.27% (n=21/109) & death - 13% (n=14/109).

Family DOTS may not be effective where there is a low literacy level in the community unless there is involvement from the RNTCP by regular monitoring and follow up.



Availability and Use of LLIN Mosquito Nets in Highly Malaria Endemic Bijapur District of Chhattisgarh, India- An Operational Research Study

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The Global Malaria Action Plan calls for the rapid scale up of key Malaria prevention intervention like widespread use of long-lasting insecticidal nets (LLINs) by people at risk for Malaria. Pregnant women and <5 children are the most vulnerable to Malaria infection. Different studies have shown that Malaria in pregnancy results in an increased risk of low birth weight maternal anaemia and perinatal mortality. Several studies have also demonstrated the effectiveness of LLINs in reduction of mortality and morbidity in young children. Bijapur district in Chhattisgarh, India is one of the high Malaria endemic districts. All households in the district were given free LLIN by the district administration. A rapid survey was conducted to assess LLIN availability at household level before the Malaria season.

A community-based cross-sectional household survey was conducted between June and July 2018 before Malaria season. Villages were randomly selected from the list of all Villages listed in the Census 2011 for Bijapur district. Approximately 24 villages were covered. Data was collected using Kobo Collect. The surveyors were Auxiliary Nurse Midwifery (ANMs) who were Mitanin (Community Health Workers) for about 8 to 10 years and trained as ANMs which was funded by state government. These Mitanins had been working in same blocks. Analysis was done using Strata 14. Descriptive statistics and multiple regression analysis were used.

Overall 54% households in the district had received LLIN. Pregnant women and < 5 children were not given preferences in the process of LLIN distribution. The study showed that 55% of the pregnant women and 46% of the < 5 children had not received LLIN. Reports of Malaria in the last 2 weeks prior to the survey among the households that did not receive LLIN was higher (18.31%) compared to the families who received the LLIN (7.34%). Further analysis indicated that family members who did not sleep under the LLIN previous night had higher Malaria (15.26%) compared to those family who slept previous night under the LLIN (5.88%). As per the Community Reporting to Village Health Nutrition and Sanitation Committee (VHNSC) for one year prior to the survey about 44% of all deaths were due to fever and are suspected to be caused by Malaria. LLIN coverage had neither reached all households level nor it had been distributed in proportion to the family size. There was huge gap in the LLIN coverage in the district. District being an extremist affected area and have shortage of trained care providers, all households should be provided with LLIN in proportion to the family size. Preference should be given to pregnant women and < 5 children in-case there is a shortfall in the availability of LLINs.

An Economic Analysis of Coastal Pollution and Health Care in Chennai City

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Seaports are major hubs of economic activity and of environmental pollution in coastal urban areas. Due to increasing global trade, transport of goods through ports has been steadily increasing and will likely continue to increase in the future. Health care is the extent to which individuals have the ability and the opportunity to live the kinds of lives they have reason to value. Peoples' ability to pursue the lives that they value is shaped by a wide range of instrumental freedoms. Human well-being comprises personal and environmental security, access to materials for a good life, good health and good social relations, all of which are closely related to each other, and inspire the freedom to make choices and take action. Coastal pollution has seriously affected the exploitable living resources, recreational and commercial uses of coastal areas and the overall integrity of the marine and coastal ecosystems. The major activities that are responsible for coastal pollution in Chennai are discharge and disposal of untreated and industrial wastes, discharges of coolant waters, harbour activities such as dredging, cargo handling, dumping of ship wastes, spilling of cargo's chemicals and metal ores and fishing activities. The air quality impacts of ports are significant, with particularly large emissions of diesel exhaust, particulate matter, and nitrogen oxides. Due to close proximity to ports, nearby communities face extraordinarily high health risks from associated air pollution. Many of these areas are low income communities of color, a fact that raises environmental justice concerns. The health effects of pollution from ports may include asthma, other respiratory diseases, cardiovascular disease, lung cancer and premature death. In children, these pollutants have been linked with asthma and bronchitis, and high levels of the pollutants have been associated with increase in school absenteeism and emergency room visits. When toxins enter the water, the toxins travel from the water which the animals drink and pass on to humans, when the animal's meat is eaten. Pollutants in the water will alter the overall chemistry of the water, causing changes in acidity, temperature and conductivity. Altered water temperature (due to human actions) can kill the marine life and affect the marine life. Further. Hence, this paper analyses Coastal Pollution and Health Care in Chennai City.

Key Words: *Coastal Pollution, Ports, Health Care*



Effect of Inter-Pregnancy Interval on Pre-Term Birth in India: Evidence from Retrospective Survey Data

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In low- and Middle-income countries 222 million women of reproductive age have an unmet need for family planning, which leads to unintended pregnancy at a short interval. Studies have found that maternal nutritional and depletion, vertical transmission of infections, and cervical insufficiency due to the short inter-pregnancy interval (IPI) results in adverse perinatal outcomes. One out of eight (13.3%: 3.6 million) births occurs preterm in India, and over 300,000 of these preterm babies die before five years of birth. Inter-pregnancy interval (IPI) was less than 12 months for one third (32%) of the total pregnancies during 2010-2016 in India. In this context, the study examines the effect of IPI on preterm birth (PTB) in India. We used data from the National Family Health Survey (NFHS-IV) conducted during 2015-16 in all states of India. NFHS-IV is two-stage sampling designed based survey, which provides information on health and family welfare at the national, state, and district level. IPI is the gap between pregnancy outcome and followed conception, is calculated using currently married women's monthly contraceptive or reproductive calendar in the last 72 months. The bivariate result shows that there is a quadratic relationship between IPI and PTB, at the lowest level of IPI <6 months PTB was 7.3% which declined to 6.5% for IPI 6-11 months and PTB increased to 8.1% for IPI >36 months. There is a significant and quadratic relationship between IPI and PTB for women from the rural area, belongs to the poorest wealth quintile, from Hindu religion, of SC or OBC social group, older than 20 years, illiterate or primary educated only, and pregnancy was desired. Interestingly, PTB was 10.9% among women aged ³30 years who got pregnant within six months of the previous pregnancy. Multivariate logistic regression result shows that the pregnancy of 6-11 months IPI were 14% less likely as the pregnancy of <6 months IPI to experience PTB. Moreover, the pregnancy of 11-12 months IPI were 11% less likely as the pregnancy of <6 months IPI to experience PTB. Risk of PTB decreases with the economic status of the mother. Illiterate, primary and secondary educated mother was at the relatively lower risk of PTB compared with higher education completed mother. Utilization of Ante-Natal-Care services reduces the likelihood of PTB. The study shows that risk of PTB is lower for IPI of 6 to 23 months. In order to maintain the recommended duration of IPI and consequent PTB, Government should meet the unmet need for family planning services.



Utilization of Maternal and Child Health Care Services: A Geospatial Analysis of India

Navtez Singh

Given the recent focus on Sustainable Development Goals 3 (Reproductive, maternal, newborn and child health), we examine whether the geographic regions that were impoverished in terms of wealth, female literacy, child nutrition, or safe delivery were also grappling with the elevated risk of utilization of maternal and child health care services; whether there were any spatial outliers; if these relationships have undergone any significant change over historical time periods. Data is emanate from Census 2011, District Level Household and Facility Survey-4 and Annual Health Survey (2012-13). The initial time, we exert geo-spatial techniques like Moran's-I, univariate LISA, bivariate LISA, spatial error regression, and spatiotemporal regression to address the research problem. For the analysis, we take India's 640 districts following the Census of India. This study brings out the stark intra-district and inter-district disparities in utilization of maternal and child health care services in India. The percentage of female literacy has a maximum value of regression (0.422: $p=0.000$). It further reveals, for the first time, that geographic regions that were indigent in female literacy were also likely to be deprived in terms of utilization of maternal and child health care services notwithstanding of the district to which they belong.



Curative versus Preventive Healthcare in Developing Countries: The Case of Menstrual Hygiene in India

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One of the major public health challenges in India is scant private investment in preventive reproductive health care. This is reflected in the poor menstrual hygiene practices where close to 62 percent of the women in India uses absorbents other than

sanitary pads since their menarche. Extant studies show that choice to use sanitary napkin is conditioned by the ability to pay but might also respond to peer effects and social learning. We argue that if poor menstrual hygiene leads to disease burden that can be remedied at relatively lesser cost, individuals are likely to discount benefits from preventive investments viz., purchase and use of sanitary pads at a higher rate. We analyse the choice of menstrual hygiene practices using National Family Health Survey data for eligible women in the 15-24 age group and find evidence that the cost of curative health care in general negatively influences the demand for sanitary pads. However, uro-genital disease exposure per se doesn't have any significant influence on the decision to use sanitary pads and other hygienic methods for menstrual protection. We also find that interaction with community health workers can indeed stimulate the demand for sanitary pad use and policy makers would do good to invest in building sanitation infrastructure for promoting menstrual hygiene practices.

Keywords: *Menstrual Hygiene, India, Preventive Health Care, Probit, Multinomial Logit*



Differentials in Menstrual Practices among young women in India: Evidence from NFHS-4

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Menstruation is a phenomenon unique to females, signifying the transition from girlhood to womanhood. There are several cultural traditions, myths, and misconceptions related to menstruation that play important role in menstrual hygienic behaviour and thus the variation in the utilisation of menstrual hygiene practices can be seen vividly. Though related to a biological phenomenon, menstrual practices are influenced by socio-economic and cultural aspect so studying the differentials menstrual practices becomes significantly important. With a relation to the women of a specific age-group (usually 10-50 years), menstruation becomes important factors in women's life. It affects work, educational attainment, social interactions and health as well. Significant literature are available focusing these issues. Though literature are available, discussing menstrual behaviour, showing menstruation and its effect on women life but all of them

are region bound or small scale studies. No such study is found that covers the menstrual behaviour among Indian women as whole. The paucity of national level data might be the biggest reason. For the first time, NFHS-4 has included questions on menstrual behaviour.

This paper investigates the socio-economic differentials and the regional variation of menstrual practices among young women (15-24 years) in India using the National Family and Households Survey data (NFHS-4). To meet the objective, Bivariate Analysis and Logistic Regression model and Moran's I index has been used. Results shows that only 36.92% of women use the hygienic medium of absorbents during menstruation i.e. using sanitary napkins, locally prepared napkins and tampons whereas 42.04 manage their menstruation by using unhygienic absorbents. Interestingly, we have found that 21.04% i.e. 57,701 of women are using both-the hygienic and unhygienic practices. The place of residence, religion, caste, wealth index, women age, education, and media exposure are found to have a significant association with different menstrual practices. Women in the living in the urban areas, having higher education, higher wealth quintile, better toilet facilities, exposure to media, getting information about menstruation are more likely to use hygienic protection. The central region (54.88%) and eastern region (55.82%) are having a high percentage of unhygienic practices while the situation is vice versa in southern region. Women in the southern regions are more likely to use hygienic practices than the other regions



Effect of Inter-Pregnancy Interval on preeclampsia/eclampsia in India: Evidence from National Family Health Survey (2015-16)

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There is limited evidence on the effect of Short IPI on preeclampsia/eclampsia in developing countries including India. There are several pathways through which short IPI leads to preeclampsia/eclampsia. First, short IPI leads to poor nutrition of mother and hence affect the preeclampsia/eclampsia. Second, short inter-pregnancy intervals do not allow a woman sufficient time to recover from the physiological stresses imposed by the previous pregnancy.

In India, we found that about 32% IPI of the total pregnancies is less than 12 months; and there is a negative association between IPI and socio-economic status. According to NFHS-4 report, 53% women aged 15-49 years are anemic in India, and existing literature is based on a birth interval which does not consider around 15% of the total pregnancy resulted in abortion, stillbirth, miscarriage or termination. Thus there is a need to understand the association between IPI and maternal health. Therefore, using the reproductive calendar, the present study aims to examine the effect of IPI on preeclampsia/eclampsia in India.

The study used the Indian version of DHS, NFHS 2015-16, a national representative survey encompassing demographic, socioeconomic, and health of the child and his mother aged 15-49 years. NFHS-4 also extensively collects information about the reproductive behavior of the women. Using currently married women's monthly reproductive history in the last 72 months IPI has been calculated. IPI refers to the gap between pregnancy outcome followed conception, means study includes only those women who had at least two pregnancy outcome (83, 166) in the last six years (total 699,686 women). The weighted bivariate and multivariate logistic regression model were used to analyze the association of IPI and maternal outcome.

The bivariate result shows that prevalence of preeclampsia/eclampsia was lowest among women having IPI more than 36 months (18.6%). Whereas, the prevalence of preeclampsia/eclampsia varies from 20% to 21% among women having IPI between <6 months to 24-36 months.

The results of multivariate logistic regression analysis also show that short IPI was significantly associated with preeclampsia/eclampsia. Finding indicates that odds of having preeclampsia/eclampsia was lower among women having 6-11 months (OR: 0.9; 95% CI: 0.85-0.96), 12-23 months (OR: 0.91; 95% CI: 0.86-0.97) and 24-36 months (OR: 0.95; 95% CI: 0.89-1.01) and >36 months (OR: 0.83; 95% CI: 0.76-0.9) as compare to women having IPI <6 months. It indicates that higher chance of adverse maternal outcome in short IPI. Hence, there is a need to generalize the awareness about to increase the gap between the two pregnancies by which to save the mother from an adverse outcome.



Maternal Health and Access to Healthcare among Migrant Workers Engaged in Informal Construction Work, Ahmedabad, India

Divya Ravindranath

In this mixed-methods study we examine how ‘migration’ and ‘informal work’ environments in the construction sector shape: a) maternal health experiences - during pregnancy, childbirth and the postpartum period b) and female workers’ ability to seek maternal healthcare. The field work for this study was undertaken at five construction sites in the city of Ahmedabad. We recorded anthropometric measurements and conducted in depth interviews with our primary sample of female migrant workers (N=55), which comprised of pregnant women, lactating mothers as well as those with children under the age of five. In order to understand the larger context, we also conducted two focus group discussions (FGDs) with male workers and reached out to other stakeholders. A majority of female participants in the study belonged to ST groups (76%), while the rest were from SC groups and Other Backward Classes (OBC). Most hailed from districts in Gujarat, Madhya Pradesh and Rajasthan, which are close to the city of Ahmedabad; a smaller number were from Chhattisgarh, Bihar, West Bengal and Jharkhand. Anthropometric measurements of our study participants (N=55) suggest that a significant proportion of women (47%) were under weight or suffered from low BMI (M= 18.36, SD= 1.7). Though women did not specifically address the prevalence of maternal morbidity, most participants reported that physical ailments, diseases and illnesses were a constant feature of their lives. Women associated morbidity with poor work and living conditions, exposure to pollution and lack of safety measures during work, thus reflecting upon the implications of informal work conditions. All women in our sample reported working until the last month of pregnancy and returned to work within two weeks of childbirth in order to prevent further wage loss. Only 32% of the women (N=50; first time mothers were excluded from this part) who participated in our study had received two or more antenatal care check-ups, 64% had had an institutional delivery and 62% had received postpartum care within two days of childbirth. Poor record of antenatal care was primarily ascribed to migration, because of which women found it difficult to follow up with hospitals in the village. Financial constraints emerged as the most important reason for delaying or not seeking antenatal care. A few women also noted that pregnancy was not an “illness” that required immediate attention or priority in household healthcare expenditure. In general, a large number of women suggested that their access to healthcare services in the city was limited because of time constraints, inability to take a break from work, irregular wage patterns that affected health expenditure and lack of familiarity with urban health systems which were difficult to reach and navigate. With respect to the location of childbirth and

the period of postpartum care, women articulated the significance of availability of social support. Pregnant women expressed the desire to go back to the village for childbirth as there was likely to be greater familial support for care, which was absent at the worksite in the city. Our study finds that informal work conditions and migration have diverse and complex implications for women in need of maternal health care. In order to improve maternal health outcomes and increase uptake of healthcare services, it is crucial that the policy framework considers some of specific challenges encountered by migrant women, some of which have been addressed in this paper.



The Burden of Anemia and its Determinants among Non-Pregnant Women in India: Insights from a Spatial Analysis

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Anemia is one of the most common and widespread nutritional deficiency disorders in the world. Though considerable reductions in the prevalence of Anemia have been achieved under some circumstances, it is not sufficient to reach the World Health Assembly target of a 50% reduction of Anemia in women of reproductive age by 2025. The aim of the present study is to analyze the spatial clustering and risk factors of Anemia among non-pregnant women in the reproductive age across districts of India. For the fulfillment of this study, data has been taken from the recent round of National Family Health Survey (NFHS-4), Census of India 2011 and Rainfall statistics have been taken from Indian Meteorological Department. Univariate, bivariate and multivariate exploratory spatial data analyses (ESDA) such as Moran's I, univariate and bivariate local indicator of spatial correlation (LISA), and spatial regressions were used to assess the spatial clustering of risk factors of Anemia in different districts of India. More than half-53.1% of the non-pregnant women aged 15-49 years were anemic in India in 2016, which varies from the highest 83.5% in Lahul and Spiti (Himachal Pradesh) to the lowest 8.9% in Phek (Nagaland). Findings suggest that all hot-spot(high-high) districts of Anemia are concerted in the Eastern states of India, while the cold-spot(low-low) districts are situated in the North-Eastern region. Significant spatial clustering of Anemia was observed in the districts with a higher proportion of the population living in lower economic status, illiteracy, poor sanitation. The empirical investigation indicates women

living in urban areas are engulfed in low nutrition status than their rural counterpart. It is found Anemia concentrated areas have lower work participation. Heavy rainfall areas are highly correlated to Anemia because rainfall areas are more prone to malaria, which is the leading cause of Anemia. There is a regional inequality of Anemia within India is a major area of concern. Attention should be given to these hot-spot areas. It is inferred from this study that anemia is associated with the urban household, age at marriage, lower economic status, illiteracy, poor sanitation. Efforts must be made to create grass hood level implementation of specific programmes that target vulnerable districts so that the prevalence of anemia can be reduced substantially.



Participation in Mid-day meal programme and Nutritional Status of primary and upper primary school children in Jaunpur district of Uttar Pradesh

Gudakesh*

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Nutritional deprivation at school-age can constrain their physical and cognitive development. In spite of rapid growth in agriculture and industrial sectors in the recent past, undernutrition continues to be a major public health problem in India. Government introduced the Mid-day meal programme of nutritional to support primary education, which offers cooked meals in primary and upper primary schools. The purpose of the present study was to see the impact of the Mid-day meal scheme on the nutritional status of school children. Besides, an attempt has been made to understand the association between malnutrition among children and nutrition security, food security and dietary diversity. Total 455 children age group of 5 to 14 years were selected for this study from 18 government schools of Jaunpur district of Uttar Pradesh. Appropriate bivariate and multivariate techniques have been used to meet the objectives. Only 13% of the household in the study come under the category of food secure and 62% household are food insecure with hunger. Around 14% of household falls under the low dietary diversity category and 58% comes in medium diversity. Around 62% of children having lunch regularly in the school and 7% never eat MDM food. More than 32% of children were

stunted. Around 35% of children regularly having lunch in the school are stunted in comparison to 29% of children not having regularly. Around 20% of children of food secure household, 30% of food secure without hunger and 35% of food secure with hunger households are stunted. Higher prevalence of stunting has been found among Muslim children comparison to Hindu. More than 35% scheduled caste, 31% OBC and 28% other caste children are stunted. Malnutrition has a close connection with household food security and dietary diversity. School-age children are unable to meet their needs of the essential. Age of children, caste, religion and socio-economic status of the household are the most important factor, which affects the nutrition. Apart from that, household food security and dietary diversity are one of the most important factors which affect the health and nutritional status of children.



Gender difference in feeding, nutrition and health care of children in EAG States of India

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Empowered Action groups (EAG) of states are lack behind most of the development indicators in India. The most important is to be found the excess female deaths from these states. However, discrimination against the surviving of girl child leads to excess child mortality and nature is unfolded and inadequate attention. Present study utilized the information of birth history from last five year reference period 2,63,089 children from National Family Health Survey -IV (2016) in EAG states of India. This group of eight states (Bihar, Chhattisgarh, Madhya Pradesh, Rajasthan, Odisha, Uttar Pradesh, Uttarakhand) who are socio-economic backward states or popularly known as “BIMARU” states in India. This paper first to examine the contribution child deaths from EAG states and gender differential in childhood mortality in EAG states. Second is find out significant gender determinants bias in breastfeeding, nutrition and health care in the EAG States of India. There are three outcome measures (feeding practice, healthcare and nutrition) used in bivariate and multivariate analysis to determine the various individual (age, child in month and size, education, gender, birth order, BMI), household (religion, caste, family size, Income), community (place of residence, state) determinants for gender differential in childhood feeding, nutrition and healthcare in EAG states of India. Despite

the transition in the level of childhood malnutrition in EAG states the pattern of changes is not uniform across socio-economic demographic characteristics. The sex-specific changes over time in childcare is sizeable improvements in long-term performances in urban areas, but some changes hide large gender differences, especially in rural India. The sex composition and household inequality model are two essential factors having a low level of nutrition and health care in EAG states.

Keywords: *Gender, Nutrition, Health Care, EAG States, Socio-Economic Factors.*



The Change in the Concentration of Acute and Chronic Undernutrition among Under- Five Children across different Household Socio-Economic Conditions in Northeast India

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Northeast India due to its mountainous terrain, distinct customary practices and lack of infrastructure is vulnerable to various chronic and acute diseases. The study aims to assess the change in the concentration of acute and chronic undernutrition across different household socio-economic condition and determine its proximate prognosticators with the objective of contributing to improving the health and nutritional practices for children under-five years of age. The study used data from the fourth round of National Family Health Survey. Distributional analysis and concentration index were used to examine the shifting nature of concentration of undernutrition. Multilevel Mixed Effect Linear Model was used for determining proximate prognosticators. Prevalence of stunting varies from 24 to 44 percent and wasting from 6.1 to 17 percent. The level of stunting decreases significantly across all the eight northeastern states of India. While there is an increasing level of wasting in three states viz. Arunachal Pradesh, Assam and Sikkim. The concentration of burden of undernutrition decrease as we move from household with lower socio-economic conditions towards household with higher socio-economic condition. Children who were breastfeed, fully immunized, delivered in a health institution

in presence of skilled personal were more likely to have higher average z-score. Mothers' health and educational status and several other interventions are also positively related to nutritional status of the children. We also experienced the plausibility of clustering of this catastrophic problem in both household level and district level. As prevention is a necessary and cost-effective means of avoiding high social, biological and economic cost of undernutrition, efforts on reduction in household socio-economic disparity should be strengthened and a proper implementation of these interventions should be made necessary and sufficient conditions to bring down the level of undernutrition.



Impact Evaluation of the Program 'Janani Suraksha Yojna': Using Coarsened Exact Matching Approach

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Janani Suraksha Yojna is a conditional cash transfer scheme to promote institutional delivery and thereby reducing maternal and neonatal mortality among population from low socioeconomic strata. Therefore, the main focus of this study is to check the impact evaluation of the Janani Suraksha Yojna scheme. The specific objectives of impact evaluation of JSY schemes are to assess trends in institutional delivery, the availability and quality of care at delivery and in post-natal period. Data used in this study is obtained from the fourth round of the National Family and Health Survey (NFHS-4), 2015-16. Coarsened exact matching (CEM), a non-parametric and a monotonic imbalance bounding method has been applied. A weighted variable of CEM was used in Binomial regression analysis to generate estimates to equalize the number of observations within comparison groups. For balance checking, multivariate imbalance measure L1 was used and it was a relative magnitude depending on the data and the selected covariates. L1 ranges from 0 (perfect global balance) to 1 (maximal imbalance), hence for performing good matching lower value of L1 statistics is expected between comparison groups. The CEM was modeled by using 'cem' command in Stata.14 versions. The highest proportion of coverage of the JSY Program is found in Orissa (74.2 %) followed by Assam and Chhattisgarh (69.3% and 66.5% respectively) which is more significant more enough than the national average (i.e, around 43%). Findings reflects that L1 statistics before and after applying CEM. As

findings can be seen that post matching L1 statistics are all close to 0, as opposed to the pre matching L1 statistics ranging from 0.303 to 0.047. Results depicts that the Effect of different independent variables on institutional delivery, viz. assistance under JSY, place of residence, women's marital status, i.e., Union, ANC visits, wealth index and Media exposure. The odds of JSY after being adjusted for other variables is around 4 times more than those who are not availing the service, after matching the odds for the same are 3.9 times more. The findings suggest that the JSY had significantly increased delivery in health care facilities and this effect is consistent with it.



Can India Achieve SDGs target related to IMR level till 2030? : A Bayesian Study

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India is playing an important role in shaping sustainable development in the world. In this article, is an attempt to explore, the Bayesian inference with the application of projection for future levels of Infant Mortality Rates (IMR) for India, through the Markov chain Monte Carlo simulation technique, using a nonlinear growth model. The main aim of the study is to examine the preparation of India to evaluate its progress towards Sustainable Development Goals (SDGs) target related to IMR under Bayesian Approach. In this paper, we have explored the use of Bayesian models to project of IMR data in India from 1991 to 2015 forward to 2041. It is also an attempt to estimate from the current study that what is the probability of India to achieve the SDGs target related to the IMR level by 2030. The present study used the Bayesian approach to predict the future-level of IMR using a nonlinear growth model using the MCMC tool. The result based on the past SRS IMR data and projections for the future period based on proposed Gompertz model. The result of proposed model is shows that the IMR of India will be reach to its minimum of 6 per live birth and it will be stabilized near after 2041. The probability of obtaining less than three IMR at the end of 2030 and result reveal that there were very less probability, around less than 0.001. The findings of this study show that India is not in the position of achieving IMR target in SDGs. It is therefore important for India to think well out on the local level and equip a pace for SDGs, especially with systematic efforts.

Theoretical Considerations on Universal Healthcare in Tamilnadu

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The healthcare system in India is dominated by the private sector which has resulted in adverse health outcomes for the people at large, especially the working poor. The underdevelopment of public health manifests itself in three ways: an inadequate system of public healthcare institutions, high out of pocket health expenditure and inequality in healthcare. Tamil Nadu has a relatively developed public health system and therefore better health outcomes as compared to most other states in India. However these achievements are more in the realm of primary healthcare than in secondary and tertiary healthcare in spite of the state having one of the most developed public health networks in the country. In Tamil Nadu, there is understaffing in government hospitals especially support staff (other than doctors and nurses in the bigger government hospitals which would invite immediate critical public scrutiny) resulting in inadequate hygiene, longer time to recover from breakdowns for health equipment etc. In some cases there are separate 'private' and 'public' wings in government hospitals with the latter providing better healthcare facilities for a payment. Further poor patients do not always obtain the full suite of healthcare services in government hospitals on account of inadequate public expenditure on health and also because Tamil Nadu, unlike Kerala does not have the requisite degree of political and social mobilisation. The public health network of Tamil Nadu is not adequate to ensure universal public healthcare. Health insurance will not be able to ensure universal healthcare since there will be issues of exclusions. Moreover health insurance administered by the private sector may also give rise to medical malpractices of various types. However building on the legacy of past healthcare achievements in the state, it is proposed that the government of Tamil Nadu move towards a system of universal healthcare that is led by the public health system. Some proposals to finance a public health system led process of universal healthcare are advocated that could mobilise resources even if the central government remains committed to neoliberal policies of privatizing the health system. The paper concludes by briefly considering the practical relevance of the policies proposed for the state of Tamil Nadu.

Key words: *universal healthcare, Tamil Nadu, neoliberal, public health*



Conceptualizing Population Ageing in India as a Triumph of Public Health: An Analysis Using New Ageing Indicators

Arun B Chandran

There has been rapid improvements in life expectancy and decrease in fertility over the last few decades in India. As a natural consequence to this, the share of population above age 60 has been increasing, also called as the rise in population ageing. Ironically, while improvements in life expectancy has been the major aim of most of public health programmes, the resultant rise in the share of 60+ population in the country is seen with scepticism. Meanwhile, the rise in the share of elderly population is concentrated among certain demographically advanced states of South India and states like Himachal Pradesh, West Bengal and Maharashtra. Since the demographically dis-advantaged states have lesser number of population above age 60, these states are ‘supposed’ to have lower ‘burden’ of population ageing. However, it is mere absence of achievements in public health programmes and life expectancy improvements that is responsible for lower levels of elderly population in these states. We analyse population ageing in India with new ageing measure that accommodates for the differentials in life expectancy in Indian states. Instead of defining ‘old-age’ as population above an abstract cut-off age of 60, we define it as the age where remaining life-expectancy is 15. The advantage of this method is that we re-conceptualize population ageing based on the improvements in life expectancies overtime in the considered area. The resultant old-age thresholds are lower for states with higher achievements in life expectancy (Kerala, Himachal and Tamilnadu) and higher for BIMARU states. Consequently, the share of elderly is higher in the BIMARU states that are demographically lagging, than based on traditional methods. Our analysis illustrates that population ageing in India is not constrained to only the demographically advanced states, but is in turn a national public health issue if it is seen from a life-course perspective.



Setting evidence-based priorities for Universal Health Coverage – Where’s the evidence?

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Health Technology Assessment (HTA) provides a globally-accepted and structured approach to synthesising evidence for cost and clinical effectiveness alongside ethical and equity considerations to inform evidence-based priorities. Increasingly, systems for generating and utilizing HTA evidence to improve allocative efficiency are being adopted in upper middle income countries. India is one of the most recent countries to formally commit to institutionalising HTA as an integral component of the health resource allocation decision-making process. The effective conduct of HTA depends on the availability of reliable data sources to enable the comparative assessment of the clinical and cost effectiveness of a given intervention within the local healthcare context. There is a marked absence of strong health information systems in LMIC, including India, and this poses a significant bottleneck to the efficient generation and deployment of HTA into the health decision space. Overcoming these data challenges will present a significant hurdle in India’s journey towards institutionalising HTA and effectively embedding economic analysis into the priority setting process. In this paper, we aim to document the currently available local data to meet the needs of undertaking economic analysis in India, and highlight how each source of data can be used in the conduct of HTA.



Unit Cost for Output Indicators of Various Programmes at PHC Level In Medak District

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Studies on cost are very important to promote efficiency and arrive at right decisions about priorities in health budgeting and planning of various programmes. Information on total and unit cost of services is required to assess the financial requirements of programme maintenance or expansion. In India not much analysis was done on the allocation of the resources (both manpower and material) in PHC on different services like Family Planning (FP), MCH, Curative services, etc., The objectives of this paper are to examine the distribution pattern of the expenditure of the PHCs by functions and components, and to calculate the unit costs of output indicators of various programmes at the Primary Health Centre (PHC) level. Economic evaluation will help to allocate the scarce resources to different services. Cost Effective Analysis (CEA) is one of the methods of economic evaluation of health intervention. CEA measures the benefits in some standard clinical outcome/ health outcome. Cost accounting method is used to collect data on costs.

Nine PHCs were selected purposively from Medak District. Cost refers to the resources which are spent on activities for providing health services. One needs to estimate different types of costs required to treat a patient when he/she comes to the PHC or sub centre for treatment, and also costs involved for field work and extension activities. Costs of any particular service is calculated on the basis of a detailed assessment of the use of resources by each patient such as salary component (time of staff members), medicines, capital and recurring, etc. Data was collected from secondary and primary resources.

Unit costs were calculated for five major health services of PHCs. 1) Illness care (ILL), 2) MCH, 3) FP, 4) Communicable Disease Control (CDC) and 5) Environmental sanitation (ENV). Time allocation data of PHC staff for the above services was used to get the salary component of the staff members.

The benefits are measured as the output measures of different services at the PHC and sub centre level. Then unit cost for each service was calculated by dividing the total costs incurred for that function with the output indicator. The resource specific expenditure of all PHCs indicates that 88.5 percent is spent on salaries of the staff members. For a better and efficient functioning of the PHCs, salary component has to be 50 to 60 percent and the recurring and component of medicines has to be raised at least up to 30 percent. The analyses of programme specific expenditure on different functions indicate that of the total resources, 25.1 per cent was spent for FP, followed by 22.1 for illness, 21.6 for MCH, 18.5 for CDC and 12.3 per cent for ENV. Budget allocation for CDC has to be increased. The unit cost of producing an FP outcome indicator is the highest for all

PHCs combined (Rs 7448) followed by MCH outcome indicator (1956), illness indicator (160). On an average one PHC had spent Rs 33.7 lakhs for the year 2013-14 and also on an average, a PHC had spent highest for FP followed by MCH and illness in that order. Kanukunta had a per capita expenditure (all functions combined) of Rs 370, which is the highest, and Bhanoor had a lowest of Rs 90. Thus, the above analysis indicates that the expenditure of all functions for PHCs is not in proportion to their population suggesting that the allocation of funds to PHCs has to be done based on population.



Who Will Pay My Bills? Assessment of Health Insurance Schemes on Health Care Spending in India through Capability Approach

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Unmet needs in healthcare financing can be addressed through better provisioning of social protection mechanisms especially among the Low and Middle Income Countries (LMICs) such as India. Present paper dwells into the theoretical insight from Sen's capability approach and empirically tries to examine the effectiveness of health insurance in reducing Out of pocket expenditure (OOPE) and catastrophic health expenditure (CHE). Data were extracted from the National Sample Survey Organization, 71st round "Health", 2014. Multivariate Generalized Linear Regression Model (GLRM) has been employed to analyse socio-economic and demographic confounders associated with the impact of health insurance and reimbursement on the level of OOPE and CHE. Publically financed health insurance (PFHIs) schemes (18%), are more widely availed along with the limited private insurance (3.50%). Multivariate analysis indicates that being elderly, literate, urban residence, higher caste, class, and social group affiliation, private care, having CVD, Cancer, and residing in western regions were significantly associated with the high insurance coverage, reimbursement, and OOPE and CHE. Having access to PFHIs and received reimbursement, results into lower risk of OOPE (Adj. $\beta=-0.175$) and CHE (Adj. $\beta=-0.085$). Interestingly, non-reimbursed households have recorded low level of OOPE (Adj. $\beta=-0.599$), with significantly higher risk of CHE (Adj. $\beta=0.852$). Present study strongly recommends that having insurance coverage alone is not an answer to reduce the widespread inequalities in access to healthcare. An efficiently managed reimbursement mechanism can reduce the un-just financial burden and catastrophe due to health care payments.

Keywords: *Health Insurance, reimbursement, OOPE, CHE, Capability approach, India.*

Can India Leap towards Universal Health Coverage through Ayushman Bharat Programme? A Critical Examination Based on Health Insurance Coverage, Distribution and Predictors

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Universal Health Coverage (UHC) is one of the targets of Goal-3 of the Sustainable Development Goals (SDG). Many low and middle-income countries (LMIC) are now aspiring to achieve UHC. During last decade, many LMICs have introduced tax-based health insurance scheme. In 2018, the GoI announced a mammoth health programme known as 'Ayushman Bharat' (AB) which is widely propagated as a step towards UHC.

To understand the coverage, distribution and predictors of health insurance coverage in India and Bihar.

To examine the potential of health insurance under Ayushman Bharat scheme towards universal health coverage in India.

We analyzed unit level data from NFHS-4 to understand the coverage, distribution and predictors of health insurance in India and Bihar. Based on standard definitions, we categorized the health insurance schemes in following four major categories: Mandatory health insurance, Employer-based health insurance, Community-based health insurance, Voluntary health insurance scheme. Descriptive and bi-variate analysis was conducted to understand the coverage and distribution of health insurance. Logit regression analysis was carried out to understand the predictors of health insurance in India and Bihar.

One quarter of households in India and 12% in Bihar are covered by health insurance. Almost 73% of households with health insurance in India are covered by mandatory health insurance scheme only. This proportion is even higher in economically backward states. According to an estimate by World Bank in 2012, around 25% were households were covered by any health insurance at all India level. The contribution of non-mandatory types of health insurance is almost negligible. Only less than 2% households in country have any voluntary health insurance. Household wealth was also directly proportional to health insurance coverage in India but in Bihar the middle-class group of poorer, middle and richer section seems to be lagging behind. The urban, affluent and educated social group had higher coverage for all India level but lower coverage in Bihar. Although the coverage of voluntary and employer-based health insurance among urban, affluent and educated group was higher in India as well as Bihar.

While India is trying to leap towards UHC by introducing health insurance scheme for poor and vulnerable, the country must also take definite policy direction to protect other groups of citizens from increasing cost of care and regulate the rising cost of care for those not covered.

Private Hospitals in Health Insurance Network in India: A Reflection for Implementation of Ayushman Bharat

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The expansion of government sponsored health insurance schemes (GSHIS) in India over the last decade has brought private health care providers to the forefront. Over the years, several GSHIS schemes which rely mostly on private health care providers for service delivery have been initiated and expanded throughout the country. Existing evidence on private health facilities is mostly confined to informal establishments and primary surveys of hospitals in selected urban pockets. Lists of empanelled hospitals in GSHISs also provide some indication of the availability of private providers in a few Indian States, which may not represent the scenario of the entire country. Country-wide figures on registered private establishments engaged in ‘hospital’ activities is also available from the 6th Economic Census conducted by the Ministry of Statistics and Programme Implementation (MOSPI), Government of India in 2015. However, the number of registered providers that can be identified in the database is small and, therefore, is less meaningful for any analysis. A recent circular issued by the Insurance Regulatory Development Authority (IRDA) mandated all private hospitals associated with insurance companies or TPAs to register with ROHINI (Registry of Hospitals in Network of Insurance) maintained by Insurance Information Bureau (IIB), a subsidiary of IRDA, by March 2017. This has made ROHINI a potential source of information on all hospitals which are in the network of insurance companies and TPAs. This paper attempts to derive an understanding of the availability and horizontal distribution of private hospitals across India, keeping in view the targeted population under AB-PMJAY. Further, it analyses the spread and extent of different kinds of health services provided by private hospitals in the State sponsored health insurance schemes of Andhra Pradesh and Tamil Nadu.

This study found that bulk of the eligible population of AB-PMJAY are concentrated in areas where supply of health services through private hospitals is low and intra-state inequity in distribution of private hospitals is high. Further, the concentration of private hospitals registered for specialised services in the insurance schemes of Andhra Pradesh and Telangana are concentrated only in specific areas. In Tamil Nadu, the variation in the distribution of private hospitals across districts is relatively less. In general, the concentration of private hospitals increases as one moves towards more and more specialised services. Interestingly, the number of private hospitals empanelled in state-sponsored insurance schemes in Andhra Pradesh, Telangana, Tamil Nadu and Karnataka, is remarkably lower than the number of hospitals empanelled by insurance companies. This points towards the fact that there are entry barriers in participation of private hospitals in state-sponsored insurance schemes.

Outpatient care and expenses: Are they insignificant to ignore in designing an insurance programme?

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Both RSBY and the recently announced Ayushman Bharat National Health Protection Scheme do not offer any coverage for outpatient (OP) care. The OP expenses can have large welfare reducing effects for households with elderly and chronically ill members. A number of convincing arguments can be provided to argue that exclusion of OP care from insurance coverage may jeopardize the main purpose of financially protecting households from catastrophic medical expenses. Against this backdrop, the paper takes up the following questions: (1) what is the extent of OP care need of the population in India and how expressed need varies across population depending upon different individual, household and contextual characteristics? (2) What is the extent of OP care expenditure (collected with limited recall period) and how the expenditure varies across individual, household and contextual characteristics? The paper primarily uses National Sample Survey (NSS) 71st round (2014) unit record data. The expressed need, utilization, choice of institution and system of medicine for OP care are analysed by using logistic regressions. Finally, household-level expenses on OP care is analysed by using a two-part model. The paper emphasizes on chronic ailments to assess the implication of its emerging trend on OP expenses. It is found that even with a short recall period of 15 days, 5.17 per cent of the individuals are found to report at least one ailment which require OP care. The utilisation of OP care and incurring OP expenses are regular features of households with elderly or with chronically ill members. This has serious implication as 17.2 per cent of the households have at least one chronically ill persons and 26.9 per cent of households have at least one elderly member. The adverse effects of non-coverage of OP care are evident for the poor both in rural and urban areas. A significantly higher percentage of illness remain untreated for the poor compared to the non-poor (24 per cent among poorest quintile as against 9 per cent among richest quintile). It is important to observe that having an insurance coverage does not reduce one's likelihood of incurring positive OP expenses, ruling out the possibility of substitution between OP care and inpatient care of short duration. It can be concluded that an insurance based health financing model which does offer adequate coverage to OP expenses, is not capable of protecting households from many unintended consequences severely diminishing their welfare.

Keywords: *outpatient care, health insurance, RSBY, Ayushman Bharat, National Sample Survey*

ASHA to ANM: Challenges and Opportunity- A Policy Analysis

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The Mitanin programme is functioning as a community health programme in Chhattisgarh since 2002, soon after the formation of the state in 2000. It served as a prototype for the ASHA (Accredited Social Health Activist) programme in the whole of the country. It was a voluntary programme at inception. Alongside this a career development pathway was planned for them. This would motivate Mitanins and provide a local health worker to the area with a comprehensive understanding of local health needs and culture.

To review the process and challenges in implementation of the policy in the state.

To assess the impact of this career advancement policy in terms of ASHA motivation and retention.

To find out the employment status of trained nursing staff under the policy.

Mixed methods were used in this study. Quantitative data collection was done using a structured interview schedule among mitanins from all the three categories, i.e., working as ANM-(243), passed out as ANM but not working currently-(115) and students in ANM schools-(129). The qualitative data collection involved focus-group-discussions among the teaching faculties and mitanins, in-depth interviews of tutors/principals and policy makers. Apart from all this, all the essential letters and documents related to the policy were extracted and studied for understanding their implications in the policy.

Majority of Mitanins (82.4%) from 1351 trained as ANM were from 14 left –wing-extremist (LWE) affected districts. Mitanins who underwent ANM training faced challenges in understanding of English language, behavioral discrimination based on their cloths, age and marital status. Fees, lodging and food expenses of training-course was financed by health department. After training out of 1351 only 450 (33.3%) have been recruited as ANM so far and of those 400 were posted in LWE districts. Majority of mitanins who are now working as ANM reported that economic stability, work satisfaction, participation in family decision making, social status and their confidence increased after their job as ANM. The major implementation issue that emerges is recruitment of ANMs after training. One of the issues was departmental criteria which says above age of 35 and those have more than 2 children will not be given jobs. There was a problem in the design of the policy - place of posting was not allocated at the time of admission to the course. Equality in work was also not managed after deployment of 2nd-ANM with existing ANMs.

Does subsidizing construction of toilet play an effective role in reducing open defecation in rural India? An impact evaluation of Swachh Bharat Mission

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India is experiencing a revamped obsession with sanitation with the launch of Swachh Bharat Mission (SBM) on 2nd October 2014 aiming towards 'Clean India' by 2019. The subsidy for toilet construction has been raised under this program amounting to additional budget expenditure of thousands of crore. Evidences are available for massive progress in toilet construction while the alarming incidence of open defecation in rural India is also being broadcasted in media quite often. The impact of subsidized toilet constructions on open defecation elimination is subject to research across different income groups as the benefit of construction subsidy is being enjoyed by only one group (BPL Households) unlike its counterpart (APL families). The paper utilized Difference-in-Difference (DID) estimation procedure to capture the reduction in open defecation after SBM across 630 districts of India. Present study finds that most of the districts are biased towards IHHL Construction among BPL households by reaping the subsidy benefit while the results are showing APL households likely to have greater probability to make a district ODF, raising doubt on efficacy of enhanced subsidy mechanism and sustainability of sanitation practices. On the other hand, study reveals that awareness generating expenditure (IEC) have higher impact on elimination of open defecation and districts with higher construction among APL families are mostly characterized by high expenditure on IEC (Information, Education and Communication). However, percentage of spending on IEC has been reduced under SBM. Hence, paper discovers that the modified strategies under SBM is fulfilling the necessary condition by toilet construction but heavy reliance on subsidized construction will not serve the sufficient condition for reaching the bigger goal of sustainable "Clean India".

Key words: *Swachh Bharat Mission (SBM), Difference-in-Difference (DID), APL (Above Poverty Line), BPL (Below Poverty Line), Subsidy, Open Defecation Free (ODF)*



Assessing the Capacity of Social Behavioural Change Communication/Information Education Communication (SBCC/IEC) In the Health Medical and Family Welfare Departments of Three States of Maharashtra, Karnataka and Telangana

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NHM considers SBCC as a critical input for fulfilling its objectives by influencing, changing, and developing human behaviours and social norms. The role of SBCC in achieving the programme results is very critical. The role of SBCC needs to be aligned to the progress made by the health department in accelerating programme interventions and outcomes. To assess capacity of the health department in the domain of SBCC and to provide recommendations for strengthening the systems and processes for SBCC at state, district, and sub district levels The study used mixed methods with both primary and secondary data collection to undertake the management review. The data was collected from the three states of Maharashtra Telangana and Karnataka. A total of 12 districts from the three states were selected based on the geographic divisions and type of districts (rural, urban, and tribal). Data collection method was in-depth interviews (IDI) of the key stakeholders at both the State and District level. Along with the officials and staff of BCC Cell at the state, the different stakeholders or duty bearers at the district, sub district, PHC and sub-centres were interviewed. It was found that in the BCC section and mass media cell in the districts, there is inadequate or lack of leadership for SBCC at the state level. The district officials do not have the necessary qualification, but their skills sets are outdated. It was found that the approved funds utilized are only about 60–70% at both the states and at district levels. It was noted that funds distribution to districts is not rationalized based on their needs. District level activities are deferred because of the delay in release of funds from the centre to the state and then to the district. Although there is a section for innovations in BCC/ICC in the PIP, it has not been adequately utilised. It was noted that Social Mobilization is the most preferred method, which comprises of Village Health and Nutrition days, Group meetings and Focus Group discussions, etc. Almost all the districts use IEC materials like pamphlets, posters, and hoardings. The staff are not yet trained formally on IPC skills for addressing the issues at the community level. It was seen that there is insufficient focus on monitoring mechanism and supervision of the implementation of IEC/SBCC activities at the state and district levels.

Full time staff are required for the SBCC section in the Health Department. A formal

mechanism is necessary for convergence among departments at the level of planning and designing of SBCC. There should be continuous collaboration with private practitioners, NGOs, faith based organizations (FBOs), etc., for certain urban and tribal districts. The under spending of the approved budgets should be avoided with efficient planning and execution both at the state and district levels. There should be timely disbursement of budgets to districts (from state allocation).



Understanding the implementation of the Chhattisgarh Rural Medical Corps Scheme to retain human resources for health in rural areas in the state of Chhattisgarh

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The Chhattisgarh government introduced the Chhattisgarh Rural Medical Corps (CRMC) scheme in 2009 to improve availability of human resources in rural and remote areas through differential financial and other incentives and extra marks for P.G. admission for health staff. An evaluation was done by PHRN to understand the scheme's implementation and gaps and the perspectives of the health personnel on it.

Qualitative study was undertaken in Kanker district. All CHCs, one PHC and one SHC in three blocks were chosen for the study on the basis of degree of difficulty in access. The PHCs under 'inaccessible' category could not be visited due to security concerns. Eligible CRMC beneficiaries were identified within facilities through snowball sampling. In-depth interviews were undertaken after informed consent using check lists. A total of 22 health staff; 19 from the facilities, two district officials and one state NHM official were interviewed. Names of respondents and blocks were kept confidential.

The financial incentive amounts have remained the same since 2012. New guidelines for CRMC were drafted in January 2017 and addressed concerns from a previous study. The revised guidelines modified its appraisal indicators to account for the limitations due to larger health systems issues. CRMC incentives and bonus marks in PG entrance are a motivating factor for doctors and Assistant Medical Officers (AMOs) to join the job and also continue working. However, older issues persists such as inadequate efforts by the government to advertise the scheme, irregularity and delays in incentive payment, lack of clarity in grading of facilities, no grievance redressal system for beneficiaries and lack of a transparent transfer policy hindering the implementation of the scheme. Health staff

complained of the larger health systems issues which prevented them from discharging their duties effectively, affecting the indicator of work performance apart from lack of proper living conditions in the region.

The CRMC scheme seems to be playing a role in attracting and retaining health personnel to rural and remote areas. However, implementation needs to be strengthened to account for the gaps if the government is to ensure health services to the most marginalised.



Private Hospitals in India- Regional Perspective

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Federal and state government together spend only 30% of total spending on health care in India. Out of pocket expenditure covers most of the health care cost in India. According to National Health Profile (NHP) 2017, one government hospital on an average serve 90 thousand population. In India private providers provide service to not only economically well off class, but also to vulnerable section of the population. Apart from co-existence of private and public sector, different systems of medicine, practitioners coexist in India. National Health Protection Scheme (Pradhan Mantri Jan Arogya Abhiyan or Ayushman Bharat), providing coverage up to five lakh rupees per family per year for secondary and tertiary care hospitalisation were announced in 2018-19 union budget for poor, deprived rural families and identified occupational category of urban workers' families, with a target of covering 50 Crore people. The scheme is proposed to be cashless and paperless at public hospitals and empanelled private hospitals. Provision of such large scale health-care intervention needs participation of private sector service providers along with government sector. Using various data published by Ministry of Statistics and Programme Implementation (MOSPI), Govt. of India, the study aims to understand the contemporary economy of private providers in India and how far the sector is equipped in terms of infrastructure, human resources, monitoring and regulations to ensure larger public health interest. It is found that among the unincorporated private health care sector, only 71% of the enterprises are registered. Results show that majority of unincorporated human health activities enterprises is situated in Uttar Pradesh, followed by West Bengal and Maharashtra. The study highlights that 67% of these enterprises are do not employ any hired worker on a quite regular basis. This study estimates that 25% of unincorporated hospitals maintain account in bank or post office savings bank account in rural sector and 65% of hospitals in urban sector do the same. This study found

that only 33% private unincorporated hospitals have internet connection. In rural sector, almost all health service providers in unincorporated private sector employ less than 10 skilled workers. Non-recovery of financial dues, fall of demand, erratic power supply are major impediments faced by these un-incorporated private hospitals. This study found that there are qualitative as well as quantitative barriers in relying on private sector to roll out Ayushman Bharat. Government needs to focus to bring these private health providers under single umbrella of regulation and quality control in terms of infrastructure and skilled labour.



Relationship between Health and Development: An analysis of 15 States.

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It is now universally accepted that poverty is both a cause and consequence of ill-health, especially when the poor in India are known to have among the worst health indicators globally. Health is considered a good summative measure of sustainable development for a variety of reasons. The health and development literature provide quite a lot of such interpretations as to the beneficial effects of better levels of health on productivity and development, but little in the way of rigorous empirical evidence. The present study is an attempt to analyse the relationship by using rigorous survey data in order to present it through an empirical evidence. We have employed the Granger Causality Test to investigate the relationship between health and economic growth in India. The annual data of major 15 states on infant mortality rate (IMR) and gross state domestic product (GSDP) from 1985 to 2015 is analysed. The main findings of this study show a bilateral causality between GSDP and IMR. The model finds out that economic growth causes a significant effect on health. However, while testing the null hypothesis for each states study finds the evidence of unilateral causality also. Which is either running from IMR to GSDP and/ or GSDP to IMR. The study recommends that government should focus on the healthcare sector to achieve a higher rate of economic growth and they should consciously try to enable and not erode health through their actions.

Keywords: *Health, economic development, Granger causality,*

Cost of National Vector Borne Disease Control Programme in North India

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More than half of the total budget (53%; INR 107 billion) allocated for communicable disease under the XII Five-year plan is earmarked towards National Vector Borne Disease Control Programme (NVBDCP). We estimated the annual and unit cost of delivering the package of health care services under NVBDCP at various levels of health care in India. The present study was undertaken in 5 districts, covering 40 sub-centres (SC), 20 primary health centres (PHC), 10 community health centres (CHC) and 4 district malaria offices (DMO), selected through multistage stratified random sampling from 3 north Indian states of Haryana, Himachal Pradesh and Punjab. Economic cost of implementing NVBDCP was assessed. Mean annual cost along with its distribution in terms of inputs used and type of services was calculated. Further, per capita cost of the complete service package along with unit cost of specific services was estimated. The mean annual cost of implementing NVBDCP at the level of SC, PHC and CHC and DMO was INR 230,420 million (199,523–264,901), INR 686,962 million (482,637–886,313), INR 1.2 million (0.9–1.5 million) and INR 9.1 million (4.6–13.5 million) respectively. It was seen that salaries alone accounted for 92%, 88.6%, 89.2% and 86% of total cost at SC, PHC, CHC and DMO respectively. Active surveillance contributed more than half of total cost at SC level (52%), the laboratory services were major determinant of cost at PHC (25%) and CHC (34%) level. At district level, fogging and spray activities contributed the highest proportion of cost at DMO (75%) level. Per capita cost for the provision of complete package of services under NVBDCP was INR 45 (37–54), 48 (29–73), INR 10 (6–14) and INR 47 (31–62) at the level of SC, PHC, CHC and DMO level respectively. The estimates from the present study can be used for future planning, policy development and assessing the programme's efficiency. The evidence provided in our study can be used as a basis for allocating resources efficiently under NVBDCP, as well as planning for scale up of services under the malaria elimination strategy.

Does Public Health Centres Protect Poor from High Out-of-Pocket Expenditure in Hospitalisation among Indian States

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Aim of this paper is to examine variation in Out-of-pocket expenditure (OOPE) on hospitalisation in public health centres among the Indian states. This paper tests the hypothesis that people residing in poorer states (with high poverty) and using public health facilities are paying significantly more on hospitalisation care than that of richer states of India. We used data health surveyed (71st round 2014) data on hospitalisation carried out by National Sample Survey Organisation. Of the total 36 states and Union territory this study focused on 20 major states including Assam who had minimum 300 observation on hospitalised episode in each public and private health center. Bivariate and multivariate analysis (log linear regression model) used for the study. Concentration index used to measure inequality on OOPE. Hospitalisation in public health center was high among the poor and poorer states in India compare to developed states. The mean OOPE on hospitalisation from public health center was INR 5688 for all the households and INR 4264 for the economically poor households of India. OOPE on hospitalisation in public health centre was low in Tamil Nadu. Expenditure of poorer states like Bihar, Odisha, Madhya Pradesh and Uttar Pradesh was 2 times higher than Tamil Nadu. Medicine cost was also significantly low in Tamil Nadu than other states. Inequality of OOPE on hospitalisation in public health centre was highest for poorer states like Bihar and Jharkhand and lowest in Kerala, Delhi, and Tamil Nadu while it not so significant in private health centre where all the states were spending. Concentration index on OOPE in developed states was low than poorer states which indicate more inequality in healthcare spending between rich and poor income households in poorer states than richer states. We found that concentration index on OOPE in public health center was high in many low income states like Uttar Pradesh, Madhya Pradesh, Jharkhand and Bihar and low in Wes Bengal. Logistic regression model shows that OOPE on hospitalisation care at public health centre is relatively high among economically poorer states than Tamil Nadu. The poorer states in India are paying significantly higher to avail in-patients care in public health center than other states. Provisioning of free medicine and diagnostic test in public health centers may reduce high OOPE, inequality and medical poverty because of hospitalisation in public health center.

Does affordability matter? Examining the trends and patterns in healthcare expenditure in India

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Sustainable Development Goals (SDGs) stresses upon the availability, accessibility, and affordability of health care services. Absence of better financing mechanism results into higher Out of Pocket Expenditure (OOPE) and catastrophe, leading towards impoverishment and poverty especially among Low and Middle Income Countries (LMICs) like India. This paper examines the major characteristics associated with the higher OOPE and also provides an insight from Andersen's behavioural model that how predisposing, enabling, and need factors influences the level and pattern of OOPE in India. Data has been used from three rounds of nationally representative Consumer Expenditure Surveys (CES) i.e. 1993-94, 2004-05 and 2011-12 conducted by the Ministry of statistics and planning implementation (MoSPI), Government of India (GoI). States has been categorized on the basis of regional classification, and Adult equivalent scale (AES) has been used to adjust the household size as per the age distribution along with the necessary price adjustments to make the figures more robust. Multiple Generalized Linear Regression Model (GLM) has been employed to explore the relative effect of various socio-economic covariates on the level of OOPE. There has been consistent rise in inpatient (4.53%), outpatient (1.2%) and total OOPE (1.4%) between 1993-2012. The share of medicines was highest in the overall OOPE. The gap between advantaged and disadvantaged segment of the population has further widened along with the noticeable regional disparities. GLM indicates that most influential predisposing factor determining the level of OOPE were: age composition(elderly/children), religion(Hindus), social-group(others), and household type (nuclear). Among the enabling factors, residence (urban), economic status (richest), sources of cooking (traditional), and lighting (non-conventional) were significantly influencing the level and pattern of OOPE among the households. There is a need to strengthen the affordability mechanism among the households to cope up with the excessive burden of health care payments. Special consideration is required to accommodate the needs of the elderly, rural, backward states and poorer segment of population for reducing the unjust burden of OOPE in India.

Key words: *Sustainable Development Goals, OOPE, affordability, GLM, Regional-disparities, India*

The Determinants and Inequalities related to Catastrophic Expenditure of Non-Communicable Diseases in India: Evidence from NSSO 71st Round on Social Consumption.

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The Global Disease Burden of Non-Communicable Diseases (NCDs) has been rising steadily in the past 2 decades as part of the larger epidemiological transition. Interestingly, along with the burden of infectious diseases on the one hand, India has witnessed a rise in NCDs too, with about 60% of all deaths accounted by NCDs as per WHO's Global Status Report on NCDs (2014). More disturbingly, in India, the presence of risk factors like tobacco & alcohol consumption coupled with physical inactivity has led to a surge in incidence of diabetes, obesity, hypertension which are considered to be pre-cursors to life-threatening diseases like cardiovascular diseases, cancer etc., Apart from the obvious deterioration of quality of life, these diseases can also inflict severe economic strain in the form of catastrophic health expenditures in a country like India with a huge poor population. Going further, there might also exist inequalities in gender, age, rural-urban areas, educational status, social status, low and high HDI states, insured, and public-private hospitals. This paper is an attempt to explore the determinants of catastrophic expenditure and inequalities in the same among the divisions mentioned above.

1. To study the determinants of catastrophic expenditure (CE) and its impact in India.
2. To analyze the inequalities in catastrophic expenditure along the divisions of sector, gender, age, Low and High HDI states, social group, insurance coverage, educational status, and healthcare provider. For the first objective, catastrophic expenditure was defined as the ratio of Out-of-Pocket Expenditure/Non-food Expenditure (OOP/NFE) exceeding various thresholds like 40%, 100% and 500%. Then a logistic regression was conducted to find out the determinants of catastrophic expenditure. The impact of catastrophic expenditure is studied by analyzing the source of finance that the households use to finance the same. The second objective required construction of concentration indices of catastrophic expenditure among various states and among the divisions of gender, age, rural-urban areas, educational status, social status, low and high HDI states, insured, and public-private hospitals.

The inpatient records (reference period -365 days) in the unit-level data of NSSO's 71st Round – Social Consumption (Health).

Based on the results of this study, focus should be on both public and private hospitals, private hospitals being the priority as private hospitals handle more patient load, has

higher odds of incurring catastrophic expenditure and has more pro-poor inequality. Another area of thrust should be rural areas (has high crude NCD prevalence, higher odds of CE and greater pro-poor inequality) and low HDI states (has higher odds of incurring CE). It is also noticed that Scheduled caste (higher pro-poor inequality), working age group (higher crude prevalence) and females (higher odds for CE) should also be focused. Finally, the problem of lack of financial protection is also a serious problem.



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