

**International Seminar**  
**on**  
**Pandemic and Population Dynamics**



**International Institute for Population Sciences (IIPS)**

**Mumbai, India**

**18-20 March 2021**

## Objective of the Seminar

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COVID-19 pandemic has an unprecedented global impact on all aspects of population dynamics. Historically, pandemics mostly affected mortality and economy of the countries. However, this pandemic is very unusual, and it has influenced all the components of population dynamics and all segments of the population directly or indirectly. Along with mortality and morbidity issues of COVID19, mobility restrictions imposed for internal and international travel raised the attention of all sections including policymakers. Pandemic led to delays in marriages due to the circumstances of lockdown along with child marriages induced by poverty. There has been a debate on the likely impact of the pandemic on the fertility on account of unmet need of family planning.

The pandemic has a larger impact on socio-psychological and economic lives of the people. The return migration induced by the loss of job and the dwindling remittance flow adversely affected families, communities and economy. Loss of jobs and curtailment in the wages, and prolonged stay without any interaction with other family members and friends have caused socio-economic and mental stress. Patients of COVID-19 faced the additional risk of developing mental health problems due to stigma and discrimination from their family members and the community. Even the front-line health care providers faced stressful condition while discharging their COVID-19 duties. It is also widely highlighted in the media that gender inequality and gender discrimination increased during the period.

Most services in health care facilities crippled during this period due to the restriction in the movement and the fear of infection. Furthermore, health providers were preoccupied with the treatment of COVID cases with scant attention for other essential services such as maternal, child health, abortion and services for non-communicable diseases.

COVID-19 has also challenged the capacity of the public health system of developing and developed countries. On the one hand, developing countries had a scarcity of infrastructure and resources; on the other hand, developed countries were not in able to manage so many cases of COVID patients. On the positive side of this pandemic, countries that were lagging in the completeness of the Civil Registration System were able to give daily COVID 19 infected cases, death and recovery.

The spurt of virtual platforms for communication, internet services, and health products during this period was tremendous. There is a deluge to the development of a vaccine for the virus globally by the pharmaceutical companies. Ventilators and ICU equipment for the care of patients were essential, and companies responded to it very emphatically. Furthermore, health and hygiene products manufactured and appeared in great quantity in the market leading to the behavioural change in the hygienic practises.

With this current scenario of the pandemic and related issues, the International Institute for Population Sciences is organising IIPS International Seminar during 18-20 March 2021 using a virtual platform. The seminar includes plenary sessions, technical sessions, and flash presentation/ poster session.

## **Seminar Organisers**

Prof. K. S. James

Prof. Sayeed Unisa

Prof. R. Nagarajan

Dr. Manoj Alagarajan

Dr. Manas R.Pradhan

Dr. Preeti Dhillon

Dr. Reshmi R. S.



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*Short Programme (Indian Standard Time)*

Sr.No	Date/Time	Session Title
<b>1</b>	18th March 2021 11.00 AM	Inaugural Session
<b>2</b>	18th March 2021 11.30 AM-1 PM	Plenary Session 1: Major Finding of National Family Health Survey -5 Chair: Prof. K.S. James Discussant: Dr Dhirendra Kumar Rapporteur: Dr Y.Vaidhehi
<b>3</b>	18th March 2021 2-3.30 PM	Technical Session -1A: Estimation and Modelling of COVID19 Pandemic Chair: Prof. S.K. Singh Discussant: Dr Anjali Radkar Rapporteur: Dr Dipti Govil
<b>4</b>	18th March 2021 2-3.30 PM	Technical Session -1B: Health Care Utilization -I Chair: Prof. Anil Kumar K. Discussant: Dr. T.R. Dilip Rapporteur: Dr Sarang Pedgaonkar
<b>5</b>	18th March 2021 2-3.30 PM	Technical Session -1C: Social Policies during Pandemic Chair: Prof. Kamala Gupta Discussant: Dr T.S. Syamala Rapporteur: Dr Suresh Jungari
<b>6</b>	18th March 2021 3.45-5.15 PM	Technical Session -2A: Data Collection during Pandemic: Challenges and Opportunities Chair: Dr S. Niranjana Discussant: Dr. Laxmi Kant Dwivedi Rapporteur: Dr Dipti Govil

<b>7</b>	18th March 2021 3.45-5.15 PM	Technical Session -2B: Health Care Utilization -II Chair: Prof. Sangamitra Acharya Discussant: Prof. Chander Shekhar Rapporteur: Dr Sarang Pedgaonkar
<b>8</b>	18th March 2021 3.45-5.15 PM	Technical Session -2C: Utilization of RCH Services during Pandemic: Collaborative Studies of IIPS and PRCs Chair: Prof. R. Nagarajan Discussant: Prof. Dhananjay W. Bansod Rapporteur: Dr Suresh Jungari
<b>9</b>	18th March 2021 5.30- 7 PM	Plenary Session 2: Estimation and Projection of Pandemic Chair: Prof. C.M. Pandey Discussant: Prof. US Mishra Rapporteur: Dr. Laxmi Kant Dwivedi
<b>10</b>	19th March 2021 11.30 AM-1 PM	Plenary Session 3: Census Estimates for 2021: Methods and Rationale Chair: Dr Pronab Sen Co-chair: Dr. Vivek Joshi Rapporteur: Dr Harihar Sahoo
<b>11</b>	19th March 2021 2-3.30 PM	Technical Session -3A: Spatial Pattern of Pandemic Chair: Prof. K.C.Das Discussant: Prof. Aparajita Chattopadhyay Rapporteur: Dr Kaushalendra Kumar
<b>12</b>	19th March 2021 2-3.30 PM	Technical Session -3B: Impact of COVID19 on lives of People -I Chair: Dr Vishnu V Rao Discussant: Prof. Archana K Roy Rapporteur: Dr Reshmi R. S
<b>13</b>	19th March 2021 2-3.30 PM	Technical Session -3C: Morbidity and Mortality during Pandemic and Non-Pandemic Period Chair: Prof. H. Lhungdim Discussant: Dr Harihar Sahoo Rapporteur: Dr Md Illias Sheik

<b>14</b>	19th March 2021 3.45-5.15 PM	Technical Session -4A Migration and Pandemic Chair: Prof. D.P.Singh Discussant: Dr Anil Chandran Rapporteur: Dr Kaushalendra Kumar
<b>15</b>	19th March 2021 3.45-5.15 PM	Technical Session -4B: Impact of COVID19 on Lives of People -II Chair: Prof. Sulabha Parasuraman Discussant: Prof. S.K.Mohanty Rapporteur: Dr Reshmi R.S.
<b>16</b>	19th March 2021 3.45-5.15 PM	Technical Session -4C: Nutritional Status of Children and Adolescents: Observations from CNNS Chair: Dr Robert Johnston Discussant: Dr Praween Agrawal Rapporteur: Dr Md Illias Sheik
<b>17</b>	19th March 2021 5.30-7 PM	Plenary Session 4: Public Health in the Era of Pandemic Chair: Prof. H.P. Sachdeva Discussant: Dr Vani Sethi Rapporteur: Dr T. R. Dilip
<b>18</b>	20th March 2021 11.30 AM-1 PM	Plenary Session 5: Longitudinal Ageing Study in India (LASI): Overview and Major Findings Chair: Prof. S.Siva Raju Discussant: Prof. Abusaleh Shariff Rapporteur: Dr. Selvamani
<b>19</b>	20th March 2021 2-3.30 PM	Technical Session -5A: Ageing, Health and Living Arrangements Chair: Prof. T.V. Sekhar Discussant: Dr A.G.Khan Rapporteur: Dr Sunil Sarode and Ms Shalini Sen
<b>20</b>	20th March 2021 2-3.30 PM	Technical Session -5B: Reproductive and Child Health Chair: Prof. B. Paswan Discussant: Prof. Murali Dhar Rapporteur: Dr Suryakant Yadav
<b>21</b>	20th March 2021 2-3.30 PM	Technical Session -5C: Population Characteristics and Components Chair: Prof. A. Shaban Discussant: Dr. Sarang Pedgaonkar Rapporteur: Dr Preeti Dhillon

<b>22</b>	20th March 2021 3.45-5.15 PM	Technical Session -6A: Non-communicable Diseases Chair: Prof. A. Pandey Discussant: Dr Manoj Alagarajan Rapporteur: Dr Suryakant Yadav
<b>23</b>	20th March 2021 3.45-5.15 PM	Technical Session -6B: Health and Nutrition Chair: Prof. Sayeed Unisa Discussant: Praveen Pathak Rapporteur: Mr Sunil Sarode and Ms Shalini Sen
<b>24</b>	20th March 2021 3.45-5.15 PM	Technical Session -6C: Gender Issues During Pandemic Chair: Prof. Vibhuti Patel Discussant: Dr Renu Kapoor Rapporteur: Dr Preeti Dhillon
<b>25</b>	20th March 2021 5.30-7 PM	Plenary Session 6: Psycho Socio-economic Impact of COVID19 Chair: Prof. Shalini Bharat Discussant: Prof. Usha Ram Rapporteur: Dr Manoj Alagarajan
<b>26</b>	20th March 2021 7-7.30 PM	Valedictory Session

### **Seminar Organisers:**

**Prof K. S. James**

**Prof. Sayeed Unisa**

**Prof. R. Nagarajan**

**Dr Manoj Alagarajan**

**Dr Manas Ranjan Pradhan**

**Dr Preeti Dhillon**

**Dr Reshmi R. S.**

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*Detailed Programme (Indian Standard Time)*

<b>Sr.No</b>	<b>Date/Time</b>	<b>Session Title</b>
<b>1</b>	18 <sup>th</sup> March 2021 11.00 AM	<b>Inaugural Session</b> Welcome -Prof K.S. James About the Seminar -Prof Sayeed Unisa Inaugural Address – Smt Sandhya Krishnamurthy, Director General, MoHFW Vote of Thanks -Prof. R. Nagarajan
<b>2</b>	18 <sup>th</sup> March 11.30 AM-1 PM	<b>Plenary Session 1</b> <b>Major Finding of National Family Health Survey -5</b> <b>Chair: Prof. K.S. James</b> <b>Discussant: Dr Dhirendra Kumar</b> <b>Rapporteur: Dr. Y.Vaidehi</b>
		<b>Title/Authors</b>  <ol style="list-style-type: none"> <li>1. Tracking Progress in Maternal and Child Health Situations in India; Evidence from 22 States/UTs <b>S.K. Singh</b></li> <li>2. Fertility and Family Planning: Opportunities and Challenges <b>Chander Shekhar</b></li> <li>3. Nutritional Transition in India <b>Laxmikant Dwivedi</b></li> <li>4. Adult Health and NCDs <b>Sarang Pedgaonkar</b></li> <li>5. Women's Empowerment and Domestic Violence <b>H Lhungdim</b></li> </ol>
<b>3</b>	18 <sup>th</sup> March 2-3.30 PM	<b>Technical Session -1A</b> <b>Estimation and Modelling of COVID19 Pandemic</b> <b>Chair: Prof. S.K. Singh</b> <b>Discussant: Dr Anjali Radkar</b> <b>Rapporteur: Dr Dipti Govil</b>
		<b>Title/Authors</b>  <ol style="list-style-type: none"> <li>1. COVID 19 Pandemic Volume of Spread and Infections at various points time in Saudi Arabia <b>Asharaf Abdul Salam, Rshood Al-Khraif, Dilip T.R., Ibrahim Elsegaey</b></li> <li>2. The Peak and Size of COVID-19 in India <b>Suryakant Yadav, Pawan Kumar Yadav, Neha Yadav, Chandra Kant Yadav</b></li> <li>3. A Comparative Study to Find a Suitable Model for an Improved Real- Time Monitoring of the Interventions</li> </ol>

		<p>to Contain COVID-19 Outbreak in the High Incidence States of India  <b>Amrutha. G S</b>, Dr. Hemkothang Lhungdim</p> <p>4. Risk Assessment of Health Care Workers Exposed to COVID-19: Evolution of Data Collection Process and Actionable Analytics at a Tertiary Care Hospital in Mumbai  <b>Satish Chandra Mishra</b></p> <p>5. Estimation of Effective Reproduction Numbers for COVID-19 using Real-Time Bayesian Method for India and its States  <b>Rishabh Tyagi</b>, Laxmi Kant Dwivedi, Ashutosh Sanzgiri</p>
4	18 <sup>th</sup> March 2-3.30 PM	<p><b>Technical Session -1B</b>  <b>Health Care Utilization –I</b>  <b>Chair: Prof. Anil Kumar K</b>  <b>Discussant: Dr. T.R. Dilip</b>  <b>Rapporteur: Dr Sarang Pedgaonkar</b></p> <p><b>Title/Authors</b></p> <ol style="list-style-type: none"> <li>Effect of COVID-19 Pandemic on the Utilization of Public Health Care Services in Tamil Nadu  <b>Sankarapandian</b>, V. Saravanakumar</li> <li>Measuring Health System Resilience in India in the Context of COVID 19 Pandemic  <b>William Joe</b>, Abhishek Kumar, Narendra Patel</li> <li>Management Perspective of COVID-19 Patients from L1 till L3 level: A Prospective Observational Study  <b>Anand Bihari</b>, Madhumita Singh, Ankit Srivastav</li> <li>Primary Healthcare Centres as the Pivots of Pandemic Mitigation: A Case Study of the Mohalla Clinics in NCT  <b>Sonali Smriti Biswas</b></li> <li>Bacterial Isolation from Respiratory Samples during SARS CoV-2 Pandemic  <b>Satender Saraswat</b>, D. P. Singh, and Swati Sarswat</li> </ol>
5	18 <sup>th</sup> March 2-3.30 PM	<p><b>Technical Session -1C</b>  <b>Social Policies during Pandemic</b>  <b>Chair: Prof. Kamala Gupta</b>  <b>Discussant:Dr T.S.Syamala</b>  <b>Rapporteur: Dr Suresh Jungari</b></p> <p><b>Title/Author</b></p> <ol style="list-style-type: none"> <li>Stigma Against infection: A Media Analysis of Coverage of COVID-19 in India  <b>Arun Kumar Sharma</b>, Bhavna Joshi, Pradip Swarnakar</li> <li>Ethnography of Van Gujjar Pastorals of Uttarakhand and Impact of Pandemic on Indigenous Knowledge System</li> </ol>

		<p><b>Iftakhar Hussain</b></p> <p>3. Birth Registration in India: A Study based on NFHS 2015-16 <b>Krishna Kumar</b>, Nandita Saikia</p> <p>4. Food Security In A Pandemic <b>Debayanti Bhowmick</b></p> <p>5. The Use of Smartphone and its impact on health and Well-being during Lockdown Period <b>Mohd Salim</b></p> <p>6. Media Professionals' Working Conditions During COVID-19 in Mumbai: A Qualitative Investigation <b>Pragati Ubale</b>, Pravin Kokane, Daivata Patil, Lahu Vitthal Rathod &amp; Ravina Ranjan</p>
6	18 <sup>th</sup> March 3.45-5.15 PM	<p><b>Technical Session -2A</b> <b>Data Collection during Pandemic: Challenges and Opportunities</b> <b>Chair: Dr S. Niranjana</b> <b>Discussant: Dr L.K. Dwivedi</b> <b>Rapporteur: Dr Dipti Govil</b></p> <p><b>Title/Authors</b></p> <p>1. Measuring Excess Mortality during the COVID-19 Pandemic in India: The Need for Mobile Phone Surveys (MPS) <b>Jayanta Kumar Basu</b></p> <p>2. Is Digitalisation A Solution To Socio-Economic &amp; Health Related Challenges Of Future Pandemics? <b>Anjali Sharma</b></p> <p>3. Tele-monitoring Continuity of Adolescents and Women's Nutrition Services Delivered by Women Collectives during the COVID-19 Lockdown: Results and Lessons from Swabhimaan Impact Evaluation Sites in Rural India <b>Neha Abraham</b>, Monica Shrivastav</p> <p>4. Constitutional Implications of Panoptic and Synoptic Gaze on Population: An Inquiry into Data Collection during Pandemic <b>Gopal Krishna</b></p> <p>5. Rapid Need Assessment for Accessibility of Digital Education during COVID-19 Pandemic. <b>Shilpa Jain</b></p>

7	18 <sup>th</sup> March 3.45-5.15 PM	<p><b>Technical Session -2B</b>  <b>Health Care Utilization -II</b>  <b>Chair: Prof. Sangamitra Acharya</b>  <b>Discussant: Prof. Chander Shekhar</b>  <b>Rapporteur: Dr Sarang Pedgaonkar</b></p> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. Effect of COVID-19 Pandemic on delivery care Services: A Review <b>Akansha Aggarwal</b>, Prof. Khan Amir Maroof</li> <li>2. Impact of Lockdown among Urban Residents in Kumbakonam <b>T.Pugalenthi</b></li> <li>3. Impact of COVID-19 on TB Notifications in India <b>Javeed Golandaj</b></li> <li>4. Healthcare Seeking Behaviour during the COVID 19 Lockdown in an Urbanized Village in Delhi: A Cross-Sectional Study <b>Aritrik Das</b></li> </ol>
8	18 <sup>th</sup> March 3.45-5.15 PM	<p><b>Technical Session -2C</b>  <b>Utilization of RCH Services during Pandemic:</b>  <b>Collaborative Studies of IIPS and PRCs</b>  <b>Chair: Prof. R. Nagarajan</b>  <b>Discussant: Prof. Dhananjay W. Bansod</b>  <b>Rapporteur: Dr Suresh Jungari</b></p> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. Introduction and Profile of Surveyed Women for The IIPS-PRC Multi-Centric Collaborative Study on Utilization of RCH Services during COVID19 Pandemic <b>Usha Ram</b></li> <li>2. Utilization of Ante-Natal Care Services during COVID19 Pandemic: Findings from IIPS-PRC Multi-Centric Collaborative Study <b>Bashir Ahmed Bhat</b></li> <li>3. Utilization of Natal and Post-Natal Care during COVID19 Pandemic: Findings from IIPS-PRC Multi-Centric Collaborative Study <b>Shriprasad H</b></li> <li>4. Utilization of Family Planning Services during COVID19 Pandemic: Findings from IIPS-PRC Multi-Centric Collaborative Study <b>Depak Das</b></li> <li>5. Utilization of Immunization Services during COVID19 Pandemic: Findings from IIPS-PRC Multi-centric Collaborative Study <b>Dilip Kumar</b></li> </ol>

		<p>6. Utilization of Child Health Care and ICDS Services During COVID19 Pandemic: Findings from IIPS-PRC Multi-Centric Collaborative Study <b>Jyoti Hallad</b></p>
9	18 <sup>th</sup> March 5.30- 7 PM	<p><b>Plenary Session 2:</b> <b>Estimation and Projection of Pandemic</b> <b>Chair: Prof. C.M. Pandey</b> <b>Discussant: Prof. US Mishra</b> <b>Rapporteur: Dr. Laxmi Kant Dwivedi</b></p> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. COVID-19 Identification through Mobile Apps and Artificial Intelligence <b>Arni S.R. Srinivasa Rao</b></li> <li>2. Covid Forecasting - Extending SEIR Model with Machine Learning(AI) <b>Modit Jain</b></li> <li>3. Models for COVID-19 Spread in India <b>Gautam Menon</b></li> <li>4. Estimation of a District-level Vulnerability Index for the Management of and Response to the COVID -19 Epidemic in India <b>Rajib Acharya</b></li> </ol>
10	19 <sup>th</sup> March 11.30 AM-1 PM	<p><b>Plenary Session 3</b> <b>Census Estimates for 2021: Methods and Rationale</b> <b>Chair: Dr Pronab Sen</b> <b>Co-chair: Dr. Vivek Joshi</b> <b>Rapporteur: Dr Harihar Sahoo</b></p> <p><b>Panel Members</b></p> <p><b>Prof.Amitabh Kundu</b> <b>Prof. PM Kulkarni</b> <b>Prof. Arvind Pandey</b> <b>Dr. K.M. Sathyanarayana</b> <b>Dr. A.A.Jayachandran</b></p>
11	19 <sup>th</sup> March 2-3.30 PM	<p><b>Technical Session -3A</b> <b>Spatial Pattern of Pandemic</b> <b>Chair: Prof. K.C.Das</b> <b>Discussant: Prof. Aparajita Chattopadhyay</b> <b>Rapporteur: Dr Kaushalendra Kumar</b></p> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. An Assessment of Covid-19 Strategies For Selected States of India: Lessons Learned For Future Pandemics <b>Saif Nihal, Anjali Sharma</b></li> <li>2. Epidemic Vulnerability Mapping based on Demographic and Household Census data: A Case study of Tiruchirappalli District, Tamil Nadu <b>Prakash. K, R. Jegankumar</b></li> </ol>

		<p>3. Geographical Analysis of Covid 19: Its Relationship With Socio- Economic Conditions In India <b>Gyanendra Singh Chauhan</b></p> <p>4. Migration and Informal Sector Scenarios during Covid 19 in Odisha: A Spatial Dimensions of Vulnerability Analysis <b>Siba Sankar Sahu, Sarmistha Singh</b></p> <p>5. Spatial pattern of COVID-19 Cases and Mortality Rate in Odisha: A Regional Analysis (2020-21) <b>Laxmikanta Rana, Siba Sankar Sahu</b></p>
12	19 <sup>th</sup> March 2-3.30 PM	<p><b>Technical Session -3B</b> <b>Impact of COVID19 on lives of People -I</b> <b>Chair: Dr Vishnu V Rao</b> <b>Discussant: Prof. Archana K Roy</b> <b>Rapporteur: Dr Reshmi R.S</b></p> <p><b>Title/ Authors</b></p> <p>1. Impact of COVID 19 on Adolescent Health: Preliminary Evidences from Kerala <b>Lekha D Bhat, KR Nayar, Bindhya Vijayan, Sumalatha B S</b></p> <p>2. Mental Health Status and Psychological Impact of the Covid-19 Pandemic on Frontline Nurses During the COVID-19 Pandemic Outbreak in India <b>Jeetendra Yadav</b></p> <p>3. Psycho-social Factors Associated with the Nationwide Lockdown in India during COVID- 19 Pandemic <b>Bhaskar Tiwary, Nilima, Siddharth Kaushik, Piyush K Pandey</b></p> <p>4. Covid 19 Lockdown Obligatory: An Exploration on Public's Perspective in Suburban Region of Northern Tamil Nadu <b>Nisha B, Rajayamini R, Ruma Dutta, Gomathy P, Timsi Jain</b></p> <p>5. Prevalence of Mental Health Issue during the Covid-19 Pandemic: A systematic Review and Meta- Analysis <b>Anandi Shukla</b></p>
13	19 <sup>th</sup> March 2-3.30 PM	<p><b>Technical Session -3C</b> <b>Morbidity and Mortality during Pandemic and Non-pandemic Period</b> <b>Chair: Prof. H. Lhungdim</b> <b>Discussant: Dr Harihar Sahoo</b> <b>Rapporteur: Dr Md Illias Sheik</b></p> <p><b>Title/ Authors</b></p> <p>1. Multimorbidity and Severity of COVID-19 Disease <b>Rashid Khan, Pawan Kumar Yadav, Suryakant Yadav</b></p> <p>2. Is Childhood Mortality Higher in Urban Poor than in Rural India? <b>Ujjwal Das</b></p>

		<p>3. Examining the Association between Socio- Economic Components and COVID-19 Fatalities in India <b>Sadaf</b>, Khursheed Ahmad Khan</p> <p>4. Vulnerability Factors of Pre-existing Under- Five Childhood Morbidity in Bangladesh, Amidst the COVID -19 pandemic Ronak Paul, <b>Rashmi</b></p> <p>5. Is communication Key to Good Health? Understanding the Depressive Symptoms, and Associated Morbidities during Pandemic <b>Rinshu Dwivedi</b>, Sindhu Vasu</p>
14	19 <sup>th</sup> March 3.45-5.15 PM	<p><b>Technical Session -4A</b> <b>Migration and Pandemic</b> <b>Chair: Prof. D.P.Singh</b> <b>Discussant: Dr Anil Chandran</b> <b>Rapporteur: Dr Kaushalendra Kumar</b></p> <p><b>Title/ Authors</b></p> <p>1. Elderly Migration in India: Pattern, Characteristics, Reasons for Migration and Systematic Review of COVID-19 Impacts on Elderly Migrants <b>Vasim Ahamad</b></p> <p>2. The Future Aspirations and Socio - Economic Profile of the Return Migrants During Pandemic to Sonitpur District of Assam <b>Girimallika Borah</b></p> <p>3. Impact of Covid-19 on the Migration and Remittances in India <b>Dimpal Dekaraja</b></p> <p>4. Examine the Health and Safety of Migrant Workers with Challenges of COVID 19 Outbreak in Textile Manufacturing Industries <b>Bharati Maurya</b></p> <p>5. Impact of Covid-19 on Lives of Children from Migrant Families in India <b>Farrukh Shah</b>, Jatinder Bir Singh</p>
15	19 <sup>th</sup> March 3.45-5.15 PM	<p><b>Technical Session -4B</b> <b>Impact of COVID19 on Lives of People -II</b> <b>Chair: Prof. Sulabha Parasuraman</b> <b>Discussant: Prof. S.K.Mohanty</b> <b>Rapporteur: Dr Reshmi R. S</b></p> <p><b>Title/ Authors</b></p> <p>1. Impact of Covid-19 Lockdown on Air Quality Index of Kolkata City. <b>Utkarsha</b>, Rajeev Ranjan Shrivastava</p> <p>2. Impact of COVID-19 Lockdown on Lives and Livelihood of Household Workers: A Cross- Sectional Study in Murshidabad District, West Bengal <b>Margubur Rahaman</b></p>

		<p>3. Covid-19 Pandemic: A Qualitative Study Of The Lived Experiences Of Empty-Nest Elderly in Kashmir <b>Shamikhah Hamid</b>, Shazia Manzoor</p> <p>4. Implications of the COVID-19 Pandemic on Future Population Growth in India</p> <p>5. <b>Kakoli Das</b>, Saswata Ghosh, Arup Kumar Das Disparity in Accessing Online Education During the COVID-19 Pandemic <b>Pralip Kumar Narzary</b></p>
16	19 <sup>th</sup> March 3.45-5.15 PM	<p><b>Technical Session -4C</b> <b>Nutritional Status of Children and Adolescents: Observations from CNNS</b> <b>Chair: Dr Robert Johnston</b> <b>Discussant: Dr Praween Agrawal</b> <b>Rapporteur: Dr Md Illias Sheik</b></p> <p><b>Title/ Authors</b></p> <p>1. Analysis of Data Quality of Birth-Weight Reporting: Evidence from Large Scale Surveys and HMIS statistics <b>Unisa, S.</b>, Anand E., Dhillon P., Sahoo H., Robert J. and Agrawal P</p> <p>2. Status and Correlates of Non-Communicable Diseases among Children and Adolescents in Slum and Non-Slum Areas of India’s Four Metropolitan Cities <b>Sahoo H.</b>, Dhillon P., Anand E., Srivastava A., Agrawal P., Robert J. and Unisa, S.,</p> <p>3. Status and Correlates of Micronutrients Deficiencies in Slum and Non-Slum Areas of India’s Four Metropolitan Cities: Investigation from CNNS <b>Dhillon P.</b>, Sahoo H., Usman M., Srivastava A., Agrawal P., Robert J. and Unisa, S</p> <p>4. Anthropometric Assessment of Children and Adolescents in Slum and Non-Slum Areas of India’s Four Metropolitan Cities Sahoo H., <b>Srivastava A.</b>, Anand E., Dhillon P., Agrawal P., Robert J. and Unisa, S</p>
17	19 <sup>th</sup> March 5.30-7 PM	<p><b>Plenary Session 4</b> <b>Public Health in the Era of Pandemic</b> <b>Chair: Prof. H.P. Sachdeva</b> <b>Discussant: Dr Vani Sethi</b> <b>Rapporteur: Dr T.R.Dilip</b></p> <p><b>Title/ Authors</b></p> <p>1. Public Health in Covid 19 – Success and Failure <b>Nilima Kshirasagar</b></p> <p>2. Challenges in Managing Chronic Diseases at the Time of Pandemic <b>Sanghmitra Pati</b></p> <p>3. Impact of COVID-19 Pandemic on Cancer Diagnosis and Care</p> <p>4. <b>Ramana Kumar Agnihotram</b></p>

		<p>5. SARS COV 2 Variants <b>R.R. Gangakhedker</b></p>
18	20 <sup>th</sup> March 11.30 AM-1 PM	<p><b>Plenary Session 5</b> <b>Longitudinal Ageing Study in India (LASI): Overview and Major Findings</b> <b>Chair: Prof. S.Siva Raju</b> <b>Discussant: Prof. Abusaleh Shariff</b> <b>Rapporteur: Dr. Selva Mani</b></p> <hr/> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. LASI - Scope, Relevance and Methodology <b>Prof. T. V. Sekher</b></li> <li>2. <b>Economic Dimensions of Ageing in India</b> <b>Prof. S.K. Mohanty</b></li> <li>3. <b>Work, Retirement and Pension of Older Indians</b> <b>Prof. Aparajita Chattopadhyay</b></li> <li>4. <b>Health Care Access and Utilization of elderly</b> <b>Dr. Dipti Govil</b></li> <li>5. <b>Biomarkers and Health Status of Elderly</b> <b>Dr. Sarang Pedgaonkar</b></li> </ol>
19	20 <sup>th</sup> March 2-3.30 PM	<p><b>Technical Session -5A</b> <b>Ageing, Health and Living Arrangements</b> <b>Chair: Prof. T.V. Sekhar</b> <b>Discussant: Dr A.G.Khan</b> <b>Rapporteur: Sunil Sarode and Ms Shalini Sen</b></p> <hr/> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. What Predicts to Elderly in Seeking Healthcare Utilization across Public Private Institutions In India: Evidence from NSSO <b>Jhumki Kundu, Dhananjay W. Bansood</b></li> <li>2. Does Socio-Economic Inequality Exist in One- Person Household Among Older Adults in India? Evidence from National Family Health Survey, 2015-16 <b>Shobhit Srivastava</b></li> <li>3. Association of Socioeconomic and Health- Related Factors with Preference for Separate Living Among Older Adults: A Cross-Sectional Study in India <b>Muhammad T., Arun Balachandran, Shobhit Srivastava</b></li> <li>4. Living Arrangements &amp; Treatment-Seeking Behavior Among Elderly with Locomotor Disability in India <b>Poulami Barman</b></li> <li>5. Health Issues, Health Care Utilization and Health Care Expenditure among Elderly in India: Thematic Review of Literature <b>Harihar Sahoo, Dipti Govil, K.S. James &amp; Ravi D. Prasad</b></li> <li>6. Working Women and Eldercare: A Qualitative Perspective</li> </ol>

		<b>Dipti Govil, Harihar Sahoo, K.S. James and Biswabandita</b>
20	20 <sup>th</sup> March 2-3.30 PM	<p><b>Technical Session -5B</b>  <b>Reproductive and Child Health</b>  <b>Chair: Prof. B Paswan</b>  <b>Discussant: Prof. Murali Dhar</b>  <b>Rapporteur: Dr Suryakant Yadav</b></p> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. Teenage Pregnancy in North India: A Comparative Analysis <b>Aditi B. Prasad</b></li> <li>2. Examining the Effect of Household Wealth and Migration Status on Utilization of Family Planning Among Women in India, 2015-16 <b>Manoj Dakua</b></li> <li>3. A Cross Sectional Study to Assess Reproductive and Child Health Profile of Working Women Residing in Urban Slums of Gwalior City <b>Swati Saraswat, Dr Satender Saraswat</b></li> <li>4. Criticality of Sex Education as Unintended Adolescent Pregnancies Shoots Amidst Covid-19 Crisis <b>Monisha Israni</b></li> <li>5. Hysterectomy among Women In South India <b>Yusra N, Anjana A</b></li> <li>6. Sterilization in India: A Comparative Analysis of</li> <li>7. Low and High Fertility State <b>Umenthala Srikanth Reddy</b></li> </ol>
21	20 <sup>th</sup> March 2-3.30 PM	<p><b>Technical Session -5C</b>  <b>Population Characteristics and Components</b>  <b>Chair: Prof. A. Shaban</b>  <b>Discussant: Dr Sarang Pedgaonkar</b>  <b>Rapporteur: Dr Preeti Dhillon</b></p> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. Disease Burden and Healthcare Utilization in the North Eastern Region of India <b>Manali Swargiary, Dr. Hem Lhungdim</b></li> <li>2. Fertility and Family Planning Differentials among Social Groups in India <b>Dewaram Abhiman Nagdeve, Prashant Bhimrao Dongardive</b></li> <li>3. Trend and Pattern of Internal Migration in India 1971-2011 <b>R Lusome, R B Bhagat</b></li> <li>4. Factors Determining Out-migration from Bihar and Uttar Pradesh, 1981-2011: A Quasi-Poisson Regression <b>Minnu Malieckal, R. Lusome</b></li> <li>5. Living Conditions and Quality of Life of Transgender in Kurnool District, Andhra Pradesh</li> </ol>

		<b>Venkata Raja Malla, Reshmi R S</b>
22	20 <sup>th</sup> March 3.45-5.15 PM	<p><b>Technical Session -6A</b>  <b>Non-communicable Diseases</b>  <b>Chair: Prof. A.Pandey</b>  <b>Discussant: Dr Manoj Alagarajan</b>  <b>Rapporteur: Dr Suryakant Yadav</b></p> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. Does Changing Life- Style and other Health-Related Issues has any Affect on the Non- Communicable Diseases among Men and Women In India?  <b>Anuj Singh, Nilesh Yadav</b></li> <li>2. Measuring and Decomposing Inequalities in Mental Disorders among Elderly in Five Low- and Middle-Income Countries: Evidence from WHO-SAGE, wave 1  <b>Nasim Ahamed Mondal, R.Nagarajan, Balhasan Ali</b></li> <li>3. Health Belief Model based Community Education Interventions on Breast Cancer Awareness and Practices among Women: A Study in Low Socio-Economic Area of Mumbai  <b>Ranjan Kumar Prusty, Shahina Begum, Anushree Patil, DD Naik</b></li> <li>4. Mapping The Hotspots of Lifestyle Diseases Using Geospatial Techniques, A Case Study Of Kerala  <b>Libina Rs, Venkita Surya D, Apsara G</b></li> <li>5. Anthropometric Risk Factors of Non-Communicable Diseases among the Elderly Population of India: Evidence from LASI Wave-1  <b>Mahadev Bramhankar, Nand lal Mishra, Gursimran Singh Rana</b></li> </ol>
23	20 <sup>th</sup> March 3.45-5.15 PM	<p><b>Technical Session -6B</b>  <b>Health and Nutrition</b>  <b>Chair: Prof. Sayeed Unisa</b>  <b>Discussant: Dr. Praveen Pathak</b>  <b>Rapporteur: - Mr. Sunil Sarode and Ms Shalini Sen</b></p> <p><b>Title/ Authors</b></p> <ol style="list-style-type: none"> <li>1. Effect of Maternal Height on the Risk of Caesarean Section in Singleton Birth: Evidence from The Large-Scale Survey In India  <b>P Marbaniang, H Lhungdim</b></li> <li>2. Age-wise Growth Pattern of Stunted Indian Children and their Correlates: Evidence from NFHS-4 (2015-16)  <b>Diksha Rani, Hemkothang Lhungdim</b></li> <li>3. Association between Gender Inequality and Maternal, Neonatal and Child Health: A Pooled Analysis of Data from 160 Countries  <b>Yuvaraj Krishnamoorthy, Karthika Ganesh, Sathish Rajaa, Sharan Murali</b></li> </ol>

		<p>4. Effect of Maternal Nutrition and Socio-Economic Factors on Child Nutrition In India <b>Aparna B</b>, P Mohanachandran Nair</p> <p>5. Age-appropriate Immunization Scenario of Children in Jharkhand <b>Bishwajeet Besra</b></p> <p>6. Understanding the Impact of COVID -19 on Adolescents (10-18 years) in India <b>Somila Surabhi</b></p>
24	20 <sup>th</sup> March 3.45-5.15 PM	<p><b>Technical Session -6C</b> <b>Gender Issues During Pandemic</b> <b>Chair: Prof. Vibhuti Patel</b> <b>Discussant: Dr Renu Kapoor</b> <b>Rapporteur: Dr Preeti Dhillon</b></p> <p><b>Title/ Authors</b></p> <p>1. The Gender Question of Pandemic: Work, Leisure and Mental Health Status of Employed Women in Kerala <b>Shabin B N</b>, Fathimath Mahitha K, Arya S Kumar, Asha S P, Tony Francis</p> <p>2. COVID-19 Pandemic and Changing Mental Health of Women: A Case Study of Bandel Area, Hooghly District, West Bengal <b>Uma Bhattacharya</b></p> <p>3. Story of Two Viruses Within and Beyond Pandemic <b>Neelam Katiyar</b>, K S Niranjana</p> <p>4. Impact of Covid-19 Pandemic on Women Work Participation in India <b>Sujata Verma</b>, K S Niranjana</p> <p>5. Impact of the Covid 19 pandemic: A study on Divorced Mothers and Mothers undergoing divorce in Kottayam district, Kerala <b>Christin Mathews</b>, Joyce Jestin</p> <p>6. Experiencing Covid 19: A Case Study of Gender Divide among Informal Sector Employment in Idukki District, Kerala. <b>Alinda George</b>, Dhanya Mohan</p>
25	20 <sup>th</sup> March 5.30-7 PM	<p><b>Plenary Session 6</b> <b>Psycho Socio-economic Impact of COVID19</b> <b>Chair: Prof. Shalini Bharat</b> <b>Discussant: Prof. Usha Ram</b> <b>Rapporteur: Dr Manoj Alagarajan</b></p> <p><b>Title/ Authors</b></p> <p>1. Consequences of the Pandemic for Young People; A Synthesis of What We Know <b>Dr Shireen J. Jejeebhoy</b></p> <p>2. Covid-19: A Call to Action, A Time to Respond <b>Dr. Saumya RamaRao</b></p> <p>3. The Sex, Gender and COVID 19</p>

		<b>Dr. Ravi Verma</b> 4. Covid-19 and Economy: How Indonesia Responded <b>Prof. Aris Ananta</b>
26	20 <sup>th</sup> March 7-7.30 PM	<b>Valedictory Session</b> <b>Welcome: Prof. Sayeed Unisa</b> <b>Report of Seminar sessions: Prof. R. Nagarajan</b> <b>Valedictory Address: Ms Nivedita Gupta, Chief Director (Stats)</b> <b>Way Forward: Prof. K.S.James</b> <b>Vote of Thanks Dr Manoj Alagarajan</b>

### **Seminar Organisers:**

**Prof K. S. James**

**Prof. Sayeed Unisa**

**Prof. R. Nagarajan**

**Dr Manoj Alagarajan**

**Dr Manas Ranjan Pradhan**

**Dr Preeti Dhillon**

**Dr Reshmi R. S.**

## Content

Session No.	Author	Topic	Page No
<b>T1A Estimation and Modelling of COVID19 Pandemic</b>			
T1A. 1	<b>Asharaf Abdul Salam,</b> Rshood Al-Khraif, Dilip TR, Ibrahim Elsegaey	COVID 19 pandemic volume of spread and infections at various points time in Saudi Arabia	1
T1A. 2	<b>Suryakant Yadav,</b> Pawan Kumar Yadav, Neha Yadav, Chandra Kant Yadav	The Peak and Size of COVID-19 in India	1
T1A. 3	<b>Amrutha. GS,</b> Dr. Hemkothang Lhungdim	A Comparative Study to Find a Suitable Model for an Improved Real- Time Monitoring of the Interventions to Contain COVID-19 Outbreak in The High Incidence States of India	2
T1A. 4	<b>Satish Chandra Mishra</b>	Risk assessment of health care workers exposed to COVID-19: Evolution of Data Collection Process and Actionable Analytics at a Tertiary Care Hospital in Mumbai	2
T1A. 5	<b>Rishabh Tyagi,</b> Laxmi Kant Dwivedi, Ashutosh Sanzgiri	Estimation of Effective Reproduction Numbers for COVID-19 using Real-Time Bayesian Method for India and its States	3
<b>T1B Health Care Utilization –I</b>			
T1B. 1	<b>Sankarapandian,</b> Dr. V. Saravanakumar	Effect of COVID-19 Pandemic on the Utilization of Public Health Care Services in Tamil Nadu	4
T1B.2	<b>William Joe,</b> Abhishek Kumar, Narendra Patel	Measuring Health System Resilience in India in the context of COVID 19 pandemic	4
T1B.3	<b>Anand Bihari,</b> Madhumita Singh, Ankit Srivastav	Management Perspective of COVID-19 Patients from L1 till L3 level: A Prospective Observational Study	5
T1B.4	<b>Sonali Smriti Biswas</b>	Primary Healthcare Centres as the Pivots of Pandemic Mitigation: A Case Study of the Mohalla Clinics in NCT	5
T1B.5	<b>Satender Saraswat,</b> D. P. Singh, and Swati Sarswat	Bacterial isolation from respiratory samples during SARS CoV-2 pandemic	6
<b>T1C Social Policies during Pandemic</b>			
T1C.1	<b>Arun Kumar Sharma,</b> Ms. Bhavna Joshi, Prof. Pradip Swarnakar	Stigma against infection: A media analysis of coverage of COVID-19 in India	7
T1C.2	<b>Iftakhar Hussain</b>	Ethnography of Van Gujjar Pastorals of Uttarakhand and Impact of Pandemic on Indigenous Knowledge System	7
T1C.3	<b>Krishna Kumar,</b> Nandita Saikia	Birth Registration in India: A study based on NFHS 2015-16	8

T1C.4	<b>Debayanti Bhowmick</b>	Food Security In A Pandemic	8
T1C.5	<b>Mohd Salim</b>	The Use of Smartphone and its impact on health and well-being during lockdown period	9
T1C.6	<b>Pragati Ubale, Pravin Kokane, Daivata Patil, Lahu Vitthal Rathod &amp; Ravina Ranjan</b>	Media Professionals' Working Conditions During COVID-19 in Mumbai: A Qualitative Investigation	9
<b>T2A</b>	<b>Data Collection during Pandemic: Challenges and Opportunities</b>		
T2A.1	<b>Jayanta Kumar Basu</b>	Measuring excess mortality during the COVID-19 pandemic in India: the need for Mobile Phone Surveys (MPS)	10
T2A.2	<b>Anjali Sharma</b>	Is Digitalisation A Solution To Socio-Economic & Health Related Challenges Of Future Pandemics?	10
T2A.3	<b>Neha Abraham, Monica Shrivastav</b>	Tele-monitoring continuity of adolescents and women's nutrition services delivered by women collectives during the COVID-19 lockdown: Results and lessons from Swabhimaan impact evaluation sites in rural India	11
T2A.4	<b>Gopal Krishna</b>	Constitutional Implications of Panoptic and Synoptic Gaze on Population: An Inquiry into Data Collection during Pandemic	11
T2A.5	<b>Shilpa Jain</b>	Rapid need assessment for accessibility of digital education during COVID-19 pandemic.	12
<b>T2B</b>	<b>Health Care Utilization -II</b>		
T2B.1	<b>Akansha Aggarwal, Prof. Khan Amir Maroof</b>	Effect of COVID-19 Pandemic on delivery care services: A Review	13
T2B.2	<b>T.Pugalenthi</b>	Impact of lock down among urban residents in Kumbakonam	13
T2B.3	<b>Javeed Golandaj</b>	Impact of COVID-19 on TB notifications in India	14
T2A.4	<b>Aritrik Das</b>	Healthcare seeking behaviour during the COVID 19 lockdown in an urbanized village in Delhi: A cross-sectional study	14
<b>T2C</b>	<b>Utilization of RCH Services during Pandemic: Collaborative Studies of IIPS and PRCs</b>		
T2C.1	<b>Usha Ram</b>	Introduction and profile of surveyed women for the IIPS-PRC multi-centric collaborative study on utilization of RCH services during COVID19 Pandemic	15
T2C.2	<b>Bashir Ahmed Bhat</b>	Utilization of ante-natal care services during COVID19 Pandemic: Findings from IIPS-PRC multi-centric collaborative study	
T2C.3	<b>Shriprasad H</b>	Utilization of natal and post-natal care during COVID19 Pandemic: Findings from IIPS-PRC multi-centric collaborative study	
T2C.4	<b>Depak Das</b>	Utilization of family planning services during COVID19 Pandemic: Findings from IIPS-PRC multi-centric collaborative study	
T2C.5	<b>Dilip Kumar</b>	Utilization of immunization services during COVID19 Pandemic: Findings from IIPS-PRC multi-centric collaborative study	

T2C.6	<b>Jyoti Hallad</b>	Utilization of child health care and ICDS services during COVID19 Pandemic: Findings from IIPS-PRC multi-centric collaborative study	
<b>T3A</b>	<b>Spatial Pattern of Pandemic</b>		
T3A.1	<b>Saif Nihal</b> , Anjali Sharma	An Assessment Of Covid-19 Strategies For Selected States Of India: Lessons Learned For Future Pandemics	16
T3A.2	<b>Prakash. K. R.</b> Jegankumar	Epidemic Vulnerability Mapping based on Demographic and Household Census data A Case study of Tiruchirappalli District, Tamil Nadu	16
T3A.3	<b>Gyanendra Singh Chauhan</b>	Geographical Analysis Of Covid 19: Its Relationship With Socio- Economic Conditions In India	17
T3A.4	<b>Siba Sankar Sahu</b> , Dr Sarmistha Singh	Migration and Informal Sector Scenarios during Covid 19 in Odisha: A Spatial dimensions of Vulnerability Analysis	17
T3A.5	<b>Laxmikanta Rana</b> , Dr. Siba Sankar Sahu	Spatial pattern of COVID-19 Cases and Mortality Rate in Odisha: A Regional Analysis (2020-21)	18
<b>T3B</b>	<b>Impact of COVID19 on lives of People -I</b>		
T3B.1	<b>Dr Lekha D Bhat</b> , Prof KR Nayar, Dr Bindhya Vijayan, Dr Sumalatha B S	Impact of COVID 19 on Adolescent Health: Preliminary Evidences from Kerala	19
T3B.2	<b>Jeetendra Yadav</b>	Mental Health Status and Psychological Impact of the Covid-19 Pandemic on Frontline Nurses During the COVID-19 Pandemic Outbreak in India	19
T3B.3	<b>Bhaskar Tiwary</b> , Nilima, Siddharth Kaushik, Piyush K Pandey	Psycho-social factors associated with the nationwide lockdown in India during COVID- 19 pandemic	20
T3B.4	<b>Nisha B</b> , Rajayamini R, Ruma Dutta, Gomathy P, Timsi Jain	Covid 19 Lockdown Obligatory: An exploration on Public's Perspective in suburban region of Northern Tamil Nadu	20
T3B.5	<b>Anandi Shukla</b>	Prevalence of mental health issue during the Covid-19 Pandemic: A systematic review and Meta- Analysis	21
<b>T3C</b>	<b>Morbidity and Mortality during Pandemic and Non-pandemic Period</b>		
T3C.1	<b>Rashid Khan</b> , Pawan Kumar Yadav, Suryakant Yadav	Multimorbidity and Severity of COVID-19 Disease	22
T3C.2	<b>Ujjwal Das</b>	Is Childhood Mortality Higher in Urban Poor Than in Rural India?	22
T3C.3	<b>Sadaf</b> , Khursheed Ahmad Khan	Examining the Association between Socio- Economic Components and COVID-19 Fatalities in India	23
T3C.4	<b>Ronak Paul</b>	Vulnerability factors of pre-existing under- five childhood morbidity in Bangladesh, amidst the COVID -19 pandemic	23
T3C.5	<b>Rinshu Dwivedi</b> , Sindhu Vasu	Is communication key to good health? Understanding the Depressive symptoms, and associated Morbidities during Pandemic	24
<b>T4A</b>	<b>Migration and Pandemic</b>		
T4A.1	<b>Vasim Ahamad</b>	Elderly Migration in India: Pattern, Characteristics, Reasons for Migration and Systematic Review of COVID-19 Impacts on Elderly Migrants	25

T4A.2	<b>Girimallika Borah</b>	Elderly Migration in India: Pattern, Characteristics, Reasons for Migration and Systematic Review of COVID-19 Impacts on Elderly Migrants	25
T4A.3	<b>Dimpal Dekaraja</b>	Impact of Covid-19 on the Migration and Remittances in India	26
T4A.4	<b>Bharati Maurya</b>	Examine the health and safety of migrant workers with challenges of COVID 19 outbreak in textile manufacturing industries	26
T4A.5	<b>Farrukh Shah</b>	Impact of Covid-19 on Lives of Children from Migrant Families in India	27
<b>T4B</b>	<b>Impact of COVID19 on Lives of People -II</b>		
T4B	<b>Utkarsha, Rajeev Ranjan Shrivastava</b>	Impact of Covid-19 Lockdown on Air Quality Index of Kolkata City	28
T4B	<b>Margubur Rahaman</b>	Impact of COVID-19 lockdown on Lives and livelihood of Household workers: A cross- sectional study in Murshidabad district, West Bengal	28
T4B	<b>Shamikhah Hamid, Shazia Manzoor</b>	Covid-19 Pandemic: A Qualitative Study Of The Lived Experiences Of Empty-Nest Elderly In Kashmir	29
T4B	<b>Kakoli Das, Saswata Ghosh, Arup Kumar Das</b>	Implications of the COVID-19 pandemic on future population growth in India	29
T4B	<b>Pralip Kumar Narzary</b>	Disparity in accessing online education during the COVID-19 pandemic	30
<b>T4C</b>	<b>Nutritional Status of Children and Adolescents: Observations from CNNS</b>		
T4C.1	<b>Unisa, S., Anand E., Dhillon P., Sahoo H., Robert J. and Agrawal P</b>	Analysis of data quality of birth-weight reporting: Evidence from large scale surveys and HMIS statistics	31
T4C.2	<b>Sahoo H., Dhillon P., Anand E., Srivastava A., Agrawal P., Robert J. and Unisa, S.,</b>	Status and Correlates of Non-Communicable Diseases among Children and Adolescents in Slum and Non-Slum Areas of India's Four Metropolitan Cities	31
T4C.3	<b>Dhillon P., Sahoo H., Usman M., Srivastava A., Agrawal P., Robert J. and Unisa, S</b>	Status and Correlates of Micronutrients Deficiencies in Slum and Non-Slum Areas of India's Four Metropolitan Cities: Investigation from CNNS	32
T4C.4	<b>Sahoo H., Srivastava A., Anand E., Dhillon P.,</b>	Anthropometric Assessment of Children and Adolescents in Slum and Non-Slum Areas of India's Four Metropolitan Cities	33
<b>T5A</b>	<b>Ageing, Health and Living Arrangements</b>		
T5A.1	<b>Jhumki Kundu, Dhananjay W. Bansood</b>	What predicts to elderly in seeking healthcare utilization across public private institutions in India: evidence from NSSO	34
T5A.2	<b>Shobhit Srivastava</b>	Does socio-economic inequality exist in one- person household among older adults in India? Evidence from National Family Health Survey, 2015-16	34
T5A.3	<b>Muhammad T., Arun Balachandran, Shobhit Srivastava</b>	Association of socioeconomic and health- related factors with preference for separate living among older adults:A cross-sectional study in India	35
T5A.4	<b>Poulami Barman</b>	Living Arrangements & Treatment-Seeking Behavior Among Elderly with Locomotor Disability in India	35

T5A.5	<b>Harihar Sahoo</b> , Dipti Govil, K.S. James & Ravi D. Prasad	Health Issues, Health Care Utilization and Health Care Expenditure among Elderly in India: Thematic Review of Literature	36
T5A.6	<b>Dipti Govil</b> , Harihar Sahoo, K.S. James and Biswabandita	Working women and eldercare: a qualitative perspective	36
<b>T5B</b>	<b>Reproductive and Child Health</b>		
T5B.1	<b>Aditi B. Prasad</b>	Teenage Pregnancy in North India: A Comparative Analysis	37
T5B.2	<b>Manoj Dakua</b>	Examining the Effect of Household Wealth and Migration Status on Utilization of Family Planning Among Women in India, 2015-16	37
T5B.3	<b>Swati Saraswat</b> , Dr Satender Saraswat	A cross sectional study to assess reproductive and child health profile of working women residing in urban slums of Gwalior city	38
T5B.4	<b>Monisha Israni</b>	Criticality of sex education as unintended adolescent pregnancies shoots up in	38
T5B.5	<b>Yusra N</b> , Anjana A	Hysterectomy Among Women In South India	39
T5B.6	<b>Umenthala Srikanth Reddy</b>	Sterilization in India: A comparative analysis of low and high fertility state	39
<b>T5C</b>	<b>Population Characteristics and Components</b>		
T5C.1	<b>Manali Swargiary</b> , Dr. Hem Lhungdim	Disease Burden and Healthcare Utilization in the North Eastern Region of India	40
T5C.2	<b>Dr. Dewaram Abhiman Nagdeve</b> , Prashant Bhimrao Dongardive	Fertility and Family Planning Differentials among Social Groups in India	40
T5C.3	<b>R Lusome</b> , R B Bhagat	Trend and Pattern of Internal Migration in India 1971-2011	41
T5C.4	<b>Minnu Malieckal</b> , R. Lusome	Factors determining Out-migration from Bihar and Uttar Pradesh, 1981-2011: A Quasi-Poisson Regression	41
T5C.5	<b>Venkata Raja Malla</b> , Reshmi Nair	Living Conditions and Quality of Life of Transgender in Kurnool district, Andhra Pradesh	42
<b>T6A</b>	<b>Non-communicable Diseases</b>		
T6A.1	<b>Anuj Singh</b> , Nilesh Yadav	Does changing life- style and other health-related issues has any affect on the non- communicable diseases among men and women in India?	43
T6A.2	<b>Nasim Ahamed Mondal</b> , R.Nagarajan, Balhasan Ali	Measuring and Decomposing Inequalities in Mental Disorders among Elderly in Five Low- and Middle-Income Countries: Evidence from WHO-SAGE, wave 1	43
T6A.3	<b>Ranjan Kumar Prusty</b> , Shahina Begum, Anushree Patil, DD Naik	Health Belief Model based community education interventions on breast cancer awareness and practices among women: A study in low socio- economic area of Mumbai	44
T6A.4	<b>Libina Rs</b> , Venkita Surya D, Apsara G	Mapping The Hotspots Of Lifestyle Diseases Using Geospatial Techniques, A Case Study Of Kerala	44
T6A.5	<b>Mahadev Bramhankar</b> , Nand lal Mishra, Gursimran Singh Rana	Anthropometric Risk Factors of Non-Communicable Diseases among the elderly population of India:Evidence from LASI Wave-1	45
<b>T6B</b>	<b>Reproductive and Child Health</b>		

T6B.1	<b>P Marbaniang, H</b> Lhungdim	Effect of maternal height on the risk of caesarean section in singleton birth: Evidence from the large-scale survey in India	46
T6B.2	<b>Diksha Rani, Dr.</b> Hemkothang Lhungdim	Age-wise growth pattern of Stunted Indian children and their correlates: evidence from NFHS-4 (2015-16)	46
T6B.3	<b>Yuvaraj Krishnamoorthy,</b> Karthika Ganesh, Sathish Rajaa, Sharan Murali	Association between Gender Inequality and Maternal, Neonatal and Child Health: A pooled analysis of data from 160 countries	47
T6B.4	<b>Aparna B, Dr P</b> Mohanachandran Nair	Association between Gender Inequality and Maternal, Neonatal and Child Health: A pooled analysis of data from 160 countries	47
T6B.5	<b>Bishwajeet Besra</b>	Age-appropriate Immunization Scenario of Children in Jharkhand	48
T6B.6	<b>Somila Surabhi</b>	Understanding the Impact of COVID -19 on Adolescents (10-18 years) in India	48
<b>T6C</b>	<b>Gender Issues During Pandemic</b>		
T6C.1	<b>Shabin B N,</b> Fathimath Mahitha K, Arya S Kumar, Asha S P, Tony Francis	The Gender Question of Pandemic: Work, Leisure and Mental Health Status of Employed Women in Kerala	49
T6C.2	<b>Uma Bhattacharya</b>	COVID-19 Pandemic and Changing Mental Health of Women: A Case Study of Bandel Area, Hooghly District, West Bengal	49
T6C.3	<b>Dr. Neelam Katiyar,</b> K S Niranjana	Story of two viruses within and beyond pandemic	50
T6C.4	<b>Sujata Verma,</b> K S Niranjana	Impact of Covid-19 Pandemic on Women Work Participation in India	50
T6C.5	<b>Christin Mathews,</b> Joyce Jestin	Impact of the Covid 19 pandemic: A study on divorced mothers and mothers undergoing divorce in Kottayam district, Kerala	51
T6C.6	Alinda George & Dhanya Mohan	Experiencing Covid 19: A Case Study of Gender Divide among Informal Sector Employment in Idukki District, Kerala	51

# ABSTRACTS

## **T1A: Estimation and Modelling of COVID19 Pandemic**

### **T1A.1**

#### **COVID 19 Pandemic Volume of Spread and Infections at various points time in Saudi Arabia**

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Saudi Arabia is affected by COVID 19 seriously with few cases in early March, its daily spread rose to nearly 5000 in mid-June. But it has brought down to less than 200 by the end of November with public health interventions. Number of persons infected in the country by 28 November, by the end of November, exceeds 357,000 with nearly 5,870 deaths, 675 critical cases, and 5018 active cases. Here, an analysis of COVID 19 statistics of Ministry of Health of the Kingdom (March-November) is carried out to explain national scenario, seriously affected locations, and disease spread in future cities – reported cases per day, active cases, and case fatality with global comparisons. COVID 19 spread all over the country within a short span of time raising alarm. Almost all locations – metropolises, medium sized cities and small cities and rural areas including 17 future cities are affected. With such a wide spread infection, the ministry of health initiatives in line with preventive and curative methods gave fruitful results in curbing the epidemic and controlling to a large extent.

### **T1A.2**

#### **The Peak and Size of COVID-19 in India**

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India ranks the second position in the world for COVID-19 cases with the highest number of daily confirmed cases since September 2020. The peak and size of daily confirmed cases is the most warranted feature for understanding the epidemiological stage of COVID-19 disease in India. The objectives of the study are to analyse the growth rates of the confirmed cases of COVID-19 in India, and to provide an expected count of the peak and the size of confirmed cases and a possible track of confirmed cases. Exponential model was applied to estimate the growth rates of daily confirmed cases. The estimated growth rates were used for calculating the doubling time. The Lotka-Euler method was applied to calculate the effective reproduction rate. SARIMA model was developed for the growth rates to predict daily confirmed cases. Results show the best fit of the exponential model over the daily confirmed cases. The growth rates estimated from the exponential model shows an unsteady, modest decline. Doubling time shows a linear increase. The effective reproduction rate declined from 3.6 persons in the third week of March 2020 to 1.14 persons at the end of August 2020 and 1.10 at the end of September 2020 and 1.02 at the end of December 2020. The diagnosis of the developed SARIMA model confirmed no trends in the residuals, no outliers, and nearly constant variance. The forecast suggests the peak value of daily confirmed cases wavers around 104,500 counts on 19 September 2020 which is very close to 97,860 counts of confirmed cases on 16 September 2020. The cumulative COVID-19 cases account for approximately 105 lakhs which is very close to the real-time size of 103 lakhs at the end of December 2020 in India.

### **T1A.3**

## **A Comparative Study to Find a Suitable Model for an Improved Real- Time Monitoring of the Interventions to Contain COVID-19 Outbreak in the High Incidence States of India**

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On 11th March 2020, The World Health Organization (WHO) declared coronavirus disease (COVID-19) as a global pandemic. There emerged a need for reliable models to estimate the imminent incidence and overall assessment of the outbreak, in order to develop effective interventions and control strategies. In this paper, we substantiate the implementation of the instantaneous reproduction number (Rins) over conventional estimation of effective case reproduction number (Rt) viz case reproduction number (Rcase), by probing the real-time estimation ability of both methodologies over credible datasets. Here we employed the daily incidence dataset of COVID-19 for India and high incidence states to estimate Rins and Rcase. We compared the real-time projection obtained through these methods by corroborating those states that are conducting high and efficient COVID-19 testing. The Rins and Rcase were estimated using R0 and EpiEstim packages respectively in R. Although, both the Rins and Rcase for the selected states were higher during the lockdown phases (i.e. March 25 - June 1, 2020) and subsequently stabilize co-equally during the unlock phase (i.e. June 1- July 31, 2020), Rins demonstrated variations in accordance with the interventions while Rcase remained generalized and overestimated. In addition to this, a larger difference in Rins and Rcase was observed for states that are conducting high testing. Of the two methods, Rins elucidated a better real-time progression of the COVID-19 outbreak conceptually and empirically, than that of Rcase. However, we also suggest considering the assumptions corroborated in the implementations which could possibly result in an erroneous projection in the real world.

### **T1A.4**

#### **Risk Assessment of Health Care Workers Exposed to COVID-19: Evolution of Data Collection Process and Actionable Analytics at a Tertiary Care Hospital in Mumbai**

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This narrative describes the challenges and evolution of data collection and analysis by a 'healthcare workers exposure risk assessment committee' (HCWERAC) at a multispecialty hospital in Mumbai to which each Covid-19 exposure to HCW was reported. (1) Formulation of standard operative procedure (SOP) for reporting of Covid-19 exposure (2) Time bound risk assessment of exposure (3) Data analysis and recommendations. SOP was prepared for contact reporting. Risk categories were defined. Paper-based questionnaire introduced. Data was manually transferred to an excel sheet and assignment of risk categories was done jointly by committee. Finally, a google form was introduced, with staged modifications, to standardize the process. Challenges faced in implementation of paper-based questionnaire: (1) Delivery and collection of physical forms was difficult from self-quarantined HCW. (2) Manual data transfer to excel spreadsheet was fallible and burdening. (3) Time bound process leading to stress if exposure occurred during evening. (4) Key questions were often unanswered, necessitating time-consuming interviews. Introduction of google form with auto-filled electronic spreadsheet with key points made as mandatory inputs helped overcome these challenges. However, there was a new set of challenge. (1) Concern on data confidentiality (2) Skepticism among committee members on new modality (3) Lack of smartphones and internet availability among subordinate staff.

These required mutual discussions and changes in google form setting. Further, provisions were made to report exposure from a colleague. Strength of data helped overcome unreasonable demand for routine Rt-PCR of all admitted patients and the questions on quality of PPE. The google form overcame many of these challenges. However, many barriers came in its implementation and it underwent multiple modifications to streamline the process.

## T1A.5

### **Estimation of Effective Reproduction Numbers for COVID-19 using Real-Time Bayesian Method for India and its States**

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WHO declared the outbreak of the novel Coronavirus, COVID-19, as a pandemic on 11th March. On 24th March, a three-week nation-wide lockdown was announced, which got extended later. Effective Reproduction Number ( $R_t$ ) helps understand how effective preventive measures have been in

controlling an outbreak. This study assesses the impact of nation-wide lockdown in slowing down the spread of the COVID-19 at the national and state level. An attempt has also been made to examine the important state-level factors responsible for the uneven distribution of  $R_t$  of COVID-19 across India's different states. The Bayesian approach based on the probabilistic formulation of standard SIR disease transmission models has been employed assuming serial interval of 4 days and basic reproduction number ( $R_0$ ) of three. India's  $R_t$  has declined from 1.81 (90% HDI: 1.64, 2.00) on 1st April to  $R_t = 1.04$  (90% HDI: 0.96, 1.13) on 9th May. India's  $R_t = 1.07$  (90% HDI: 1.01, 1.11) was observed on 21st January 2021, nearly after a year of onset of the pandemic, since  $R_t$ 's value for Kerala is still high on 21st January 2021 at  $R_t = 1.20$  (90% HDI: 1.12, 1.26). The value of  $R_t$  at the state level has shown significant variations. The testing rate had a significant impact in reducing the  $R_t$  at the state-level. The lockdown strategy has contributed to containing the spread of the virus to some extent, but India still has a long way to go. Testing Rate is the most significant factor at state-level, as testing and isolating patients sooner significantly reduces the disease spread.

## **T1B: Health Care Utilization –I**

### **T1B.1**

#### **Effect of COVID-19 Pandemic on the Utilization of Public Health Care Services in Tamil Nadu**

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COVID-19 pandemic is one of the large scale outbreaks of infectious disease with high burden of morbidity and mortality which causes disruption on economic, social and political scenario and health care services were disrupted during the lockdown period in India. The objective of the study is to assess the level of utilization of public health services during COVID-19 pandemic in Tamil Nadu and suggest ways to improve the situation. It is a descriptive cross sectional study. Two Health Unit Divisions (HUDs) in Dindigul district of Tamil Nadu was selected for the study using a purposive sample of one District hospital, SDH-2, Block PHC-2, PHC-2, Urban PHC-2 and HSCs-6 were selected for the primary data collection. Data was collected for six months including the pandemic period. Even though maternal health care services were not affected in rural areas, there was a delay in getting the services. The IPD and OPD cases had a depression in the primary and secondary facilities during the pandemic and a slow recovery noted later on. The delivery cases found increased in the District Head Quarters (DHQ) hospital due to more referral from primary and secondary facilities due to advanced safety facilities in the DHQ hospital. But, health and allied health services such as laboratory services, family planning, etc., were affected in the pandemic period. Record maintenance and reporting of health service data was affected. Primary and secondary public health facilities may be upgraded to reduce heavy patient load at the DHQ and utilization of private Institutions and hiring of private vehicles, manpower and equipment is suggested to manage the emergency in the pandemic situation.

### **T1B.2**

#### **Measuring Health System Resilience in India in the context of COVID 19 Pandemic**

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The COVID-19 pandemic has tested the ability of health systems across the world to work normally during crises. In the wake of the lockdown in India, restricted mobility for inpatient and outpatient services lead to loss of lives. Efforts were diverted towards treatment of patients showing symptoms of COVID because of which a number of people with other diseases had to forgo treatment. India's health systems suffer from serious challenges which prevent it from working efficiently. There is a need to build "resilient health system". There are large difference in capacity and efficiency of working of the health systems of the different States of India. However, no evidence exist about the performance of the health systems which could be used to assess their resilience in times of crises. A potential approach to measure the resilience could be to create a resilience index. Methodology Using Health Management Information System data on 15 indicators related to maternal and child health for the period 2019-20 and 2020-21 we create a resilience index to understand the capacity of the health systems of the States to tolerate change. The performance assessment using our index grants a greater weightage to achievement at a higher level than at a lower level we observe that most of the key primary health services related with maternal and child health have reported a huge decline. Results indicate that Punjab, Telangana, Mizoram, Meghalaya, Goa and Himachal Pradesh have a better health system as compared to rest of the States. The application of resilience index to health data for India will be helpful in strengthening the system of States which have not fared well by adopting good practices of the States which were able to cope up with the impact of the crises.

### **T1B.3**

#### **Management Perspective of COVID-19 Patients from L1 till L3 level: A Prospective Observational Study**

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The Corona virus specifically known as COVID 19 spread from Wuhan city of China to the whole world and created havoc worldwide. It is a RNA virus of family beta-corona viruses, and it is third corona virus infection after Middle East Respiratory Syndrome (MERS) and Sub-Acute Respiratory Syndrome (SARS). To assess the socio demographic status and management of COVID-19 patients in Eastern Uttar Pradesh. **MATERIALS & METHODS:** A Hospital based cross-sectional study was conducted in Government Medical College, Azamgarh, Uttar Pradesh on the subjects either suspected or confirmed with COVID 19 tests since 20 March 2020 till the submission of this research. Oral consent was taken from all the patients. The total number of patients included in the study was 1019 who were declared as COVID positive patients admitted in Isolation ward after taking throat and nasal swab followed by RT-PCR technique. The majority of patients (61.00%) were asymptomatic and the patients who were having symptoms presented sore throat and cough (32.00%), Fever and cough 19 %, sore throat, headache and body-ache (16.00%), cough, sore throat and chest pain (12.00%), vomiting and pain abdomen (0.06%). Radiological investigations have suggested mild ARDS (Acute Respiratory Distress Syndrome) in almost (10.00%) and some subjects showed COPD. There were many patients who showed severe ARDS. Out of one thousand nineteen (1019), seventy three (73.00 %) were male and eight (27.00 %) were females and the age varies from 8 years to 108 years with the mean age of 35.48 years. Out of total patients, 71 were referred due to critical illness, 30 were shifted to L1 hospital, 796 were discharged in satisfactory conditions and 122 were died. The present study concludes that most of the patients were not much literate and it was a challenge to make them understand the sensitivity of infection spread.

### **T1B.4**

#### **Primary Healthcare Centers as the Pivots of Pandemic Mitigation: A Case Study of the Mohalla Clinics in NCT Delhi**

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Since the onset of the pandemic, apprehensions regarding the preparedness of the existing healthcare infrastructure in India is being discussed and debated widely. The lockdown period was considered strategic to equip our existing healthcare infrastructure to deal with the increasing number of infections which would require large scale hospitalization. While the strengthening of the overall healthcare infrastructure has been emphasized, the role of primary healthcare centres has received special attention. Mohalla Clinics, the primary healthcare centres in Delhi, are assigned the role of ‘fever clinics’, following the directives of MoHFW. However they are not exclusively ‘fever clinics’ as they are treating all kinds of illnesses along with people with COVID-19 like symptoms and are playing a crucial role during COVID-19. This paper discusses how these clinics are providing healthcare support during the pandemic to the COVID as well as non-COVID patients. It also outlines the various methods to make the healthcare delivery more efficient and help in mitigating the pandemic. This paper is based on media reports, reports and directives by the government, telephonic interviews with doctors and staff of the clinics and patients visiting the clinics. It is argued that Delhi’s Mohalla Clinic network has the potential to deal with the pandemic at the primary level. Since these are available within the locality, people with COVID-like symptoms are avoiding delay in seeking healthcare. While the people are wary of visiting the OPDs of hospitals due to upsurge in number of COVID cases, they serve as a boon to the non-COVID patients too. The wide network of Mohalla Clinics has helped to sustain the healthcare delivery system in Delhi during the pandemic. However, there is further scope to make more efficient use of the resources offered by these clinics during the pandemic and thereafter.

## **T1B.5**

### **Bacterial Isolation from Respiratory Samples during SARS CoV-2 Pandemic**

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The advent of SARS CoV-2 pandemic in India and world brought everyone into an entirely different scenario, which world was not prepared for. As this was a new and developing infection, all the treatment therapies, remedies and diagnostics were in a developing mode throughout.

Microbiology played a crucial role as it was the basis of diagnostics in the latest pandemic with techniques including RT- PCR, CBNAAT, TruNAT, etc. A nasopharyngeal (NP) swab and/or an oropharyngeal (OP) swab are often recommended for screening or diagnosis of early infection but invasive sampling of Endotracheal aspirate and BAL fluid is another level of diagnosis. Also, there was an evolving pattern of organism recovery and their isolation from the hospitalized patients in relation to SARS CoV-2. Objective To compare the distribution of bacterial pathogens in SARS CoV-2 negative and positive patients, respectively, during the pandemic. This is a cross sectional prospective study among SARS CoV-2 negative hospitalized ICU patients at UPUMS, Saifai, UP. The respiratory samples like Endo Tracheal aspirate and BAL fluid were collected and the organisms recovered during the period of March 2020 to August 2020 were processed for cultures and the identification of the bacteria yielded. In SARS CoV-2 positive patients with positive bacterial cultures (30), majority of isolates were *Staphylococcus aureus* (40%), followed by *Escherichia coli* (27%), *Klebsiella pneumoniae* (20%), and *Pseudomonas aeruginosa* (13%). Also, *Acinetobacter baumannii* (59%) was isolated in majority of samples followed by *Staphylococcus aureus* (17%), *Klebsiella pneumoniae* (13%), *E. coli* (7%) and *Pseudomonas aeruginosa* (4%) in case of SARS CoV-2 negative patients with positive bacterial cultures (46). This suggests an indicative picture of bacterial growth favoured by SARS CoV-2 infection.

# **T1C: Social Policies during Pandemic**

## **T1C.1**

### **Stigma against Infection: A media Analysis of Coverage of COVID-19 in India**

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The year 2020-21 witnessed the sudden development of the covid pandemic affecting most parts of the world. It led to a great fear of contracting a contagious virus- SARS-CoV-2, and consequently, manifesting into several stigmatizing attributes, mostly against the vulnerable sections of society, and reinforcing various types of social cleavages at the micro and macro levels. India is no except to it. This is not to deny that the new forms of stigmas were anchored in the earlier forms of social divisions and stigmas. This study attempts to investigate the (1) nature; (2) causes; and (3) effects of COVID-19 based stigma during the first two phases of the lockdown in India, i.e., between 25 March and 3 May 2020. The data were collected from internet site Factiva Global New Monitoring site – a media repository using the keywords 'covid' and 'stigma'. A total of 161 online media articles published during the reference period were identified and analyzed using the technique of media content analysis. Our findings suggest that during the initial lockdown, social stigma based on the concept of “other community” was the most prominent form of stigma in India. Moreover, misconceptions about the virus, largely due to social media circulation, emerged as the leading cause of stigma. The results document the processes of reassessment and reconfiguration of the social relationships by distancing 'normal' from the 'discredited'. It was observed that the suspected and affected COVID-19 patients and the healthcare staff were the most discriminated against by the local actors sharing social and economic ties with them. In terms of policy implications, a two-step suggestion is proposed- (1) monitoring and control of misinformation at the level of social media through identifying the most circulated rumors and misconceptions, and (2) use of mass media to circulate authentic information from reliable sources.

## **T1C.2**

### **Ethnography of Van Gujjar Pastorals of Uttarakhand and Impact of Pandemic on Indigenous Knowledge System**

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The research focuses on the Van Gujjar pastoral community of Utrtrakhand (Theri Garwal region). Van Gujjars are not only practice pastoralism but are also the followers of Islam. Ethnographic field work was carried form October 2019 to March 2020. As early 2020 was also the time when one of the worlds harshest lockdown was observed in India. The direct impact of the lockdown was that pastoral communities cannot ‘migrate’ to other regions without getting persecuted by the police. Worse still in the case of Muslim Pastoral such as van gujjars they had to be extra cautious about their precarious situation they were in. There are number of articles written on the issues of many communities in Pandamic but there is hardly anything which can be found to understand the how nomadic communities adapted to the new reality of pandemic. Through an Ethnography of the community the researcher wants to focus on the community organisation and present information to better equip the future researchers to have prior information of the community before going for any big intervention or research. And hopefully present an information for better intervention in future. Roughly around 40 million are currently practicing pastoralism in India. Already facing an acute shortage of fodder and an agnostic relationship with the state machinery. As the communities’ practice indigenous livestock rearing, dependent on commons. While reducing commons is another problem along with many other issues. The ban to stop the spread of novel coronavirus (COVID-19), will have unintentional consequences for these communities. Aftab a Van Gujjar from Rajaji national Park, Rishikesh, have a herd of 40 buffalo, out of which, 19 were milch. Says “till today march we had some leftover from the fodder (parali). As the administration is not allowing anyone to go out.

### T1C.3

#### **Birth Registration in India: A study based on NFHS 2015-16**

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About 2.7 million children under age five years do not officially exist in India. Consequently, these children are deprived of government-aided essential services such as fixed years of formal education, healthcare, and legal protection. Therefore, this study aims to identify the significant covariates of birth registration in India. We used data from the nationally representative fourth round of the National Family Health Survey (NFHS-4), 2015 -16. We carried out the bivariate analysis and multilevel binary logistic regression to identify significant covariates at the individual, district, and state levels.  $\beta$ -coefficient and standard error for each independent factor were generated using statistical models to determine the likelihood of birth registration. Spatial mapping of completeness of birth registration was done using GIS. We found lower birth registration was recorded in Uttar Pradesh, Bihar, and Arunachal Pradesh. In Uttar Pradesh, 11 out of 71 districts recorded lower than 50% birth registration.

Besides, four Arunachal Pradesh districts, Purba Champaran in Bihar, Rajouri in J&K, and Dhaultpur in Rajasthan, recorded lower than 50% birth registration. We also found a lower proportion of children are registered among age group 2-5 years (63%), among male children (64%), and among children of higher (3+) birth order (53%). Besides, a lower proportion of children were registered among illiterate (55%) mothers. Moreover, children among Muslims ( $\beta=-0.082$ ; SE=0.021) and poorest wealth quintile ( $\beta=-0.740$ ; SE=0.039) had a lower likelihood for birth registration. Children's age, birth order, place of residence, religious affiliation, and vaccination appear to be significant determinants of birth registration. We strongly suggest linking the birth registration facilities with health institutions. Periodic awareness campaigns on birth registration benefits among underprivileged population groups and low-performing districts may improve birth registration.

### T1C.4

#### **Food Security in a Pandemic**

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The paper *FOOD SECURITY IN APANDEMIC*, published by *PAHO-WHO*, presents a conceptual framework of the probable disruptions that a flu based pandemic may cause and the possible measures which could be opted by the existing bodies in-charge in tackling those. I took this paper as a reference point to analyse the food security situation of West Bengal during the pandemic lockdown. To analyse the food security situation of West Bengal during the pandemic lockdown, in the context of the PAHO-WHO published guideline. The given document identifies food security under three broad pillars i.e. i. Availability: Enough food for the population ii. Access: Obtaining available food iii. Utilization: Making the best of the food consumed At the National level however, Inaccessibility, unavailability and under- utilization of food is an already existing challenge which is yet not been addressed over the years. As a result, it was a tough job to safeguard food requirements across the country. The most vulnerable population under this crisis happened to be the regular wage earners, women laborers, agricultural laborers and farmers. Rations were being concentrated only within few hands especially those who tends to enjoy accessibility or political favoritism. At the State level: Field report of the PDS system has been referred upon. There have been incidences of conspicuous consumptions, complaints against ration shortage, fund crunch and clashes with middle men. Unfair distribution system, biased treatment to groups having a certain political alignment and hindrances from local political goons were usual news circulating the news channel. The given document is a well drafted advisory that needs to be referred to during any pandemic crunch. However, as the guidelines elaborate on the response and preparedness possibilities, we see how food security expands beyond just access, availability and utilization of food

## **T1C.5**

### **The Use of Smartphone and its Impact on Health and Well-being during Lockdown period**

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During lockdown the people was depend on the Smartphone either for entertainment or for online education. The excessive use of Smartphone can impact on human health and well-being. The use of Smartphone was increase during lockdown among the people compared to prior lockdown period.

After the Covid-19 pandemic in 2020 it has been seen that all institutions, industries, banks and other organisation has been shut down and the people have to stay at home. The unmanaged and excess use of Smartphone also has a negative effect on an individual health i.e., sleep deprivation, brain cancer, hypertension and vision problems etc. In this backdrop, this study gives an insight regarding the excessive use of Smartphone as well as its impact on health and wellbeing among the youth during Covid-19 period.

Methodology: In this study the researcher has used primary and secondary data. The primary data has been collected through online survey by using Google form. Simple Random Sampling method was used to collect data. The respondents using Smartphone belonged to 15 to 30 age group has been selected randomly Findings: The study reveal that the respondents experiencing health problem due to excessive use of Smartphone

### **Media Professionals' Working Conditions during COVID-19 in Mumbai: A Qualitative Investigation**

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After the nation-wide lockdown in India since last week of March, working conditions of media professionals has changed drastically. Reporting and prioritization of news streamlined around COVID-19. This study is conducted to understand the working conditions of media professionals from Mumbai; with the challenges they face and to check their preparedness during the pandemic. In-depth telephonic interviews (N=10) were carried out to acquire experiences of media professionals concerning their combat against COVID-19. Field reporters, anchors, editors and photographers were interviewed (from 1st July to 15th July,2020). This sample was carefully picked to study representation of electronic media, print media and digital media. Interview transcripts prepared for the study are based on Haase's adaptation of Colaizzi's phenomenological method. Three categories emerged and were observed while analyzing the data. The first category is workplace efficacy and it consists of: (a) Changing working conditions (b) Innovations adopted and (c) Technologies used during COVID-19. The second category is self-efficacy and it deals with (a) Organizational support and (b) Social stigmatization and family acceptance. Third category is future efficacy and it takes into consideration (a) Prioritization of News and (b) Long term impact in media. Findings suggested unpreparedness of media organizations of handling a pandemic situation. Media houses got an added benefit of employees comprising of maximum youth and therefore could perform their tasks with lesser risk. Organizational support is lacking, and media professionals need to be given more robust working conditions. A strong need for policy level changes is recommended to the media organizations to not only create a support system for their employees but also focus on handling crisis situations in a more humane manner.

### **T2A: Data collection during Pandemic: Challenges and opportunities**

### **T2A.1**

#### **Measuring Excess Mortality during the COVID-19 pandemic in India: The need for Mobile Phone Surveys (MPS)**

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Monitoring mortality is an essential component of an effective response to the COVID-19 pandemic. COVID-19 surveillance system around the world count primarily deaths occurring in hospitals to individuals who tested positive to SARS- COV-2. In low and lower-middle income countries (LLMICs) like India, surveillance systems usually undercount the number of deaths due to COVID-19, but Civil Registration and Vital Statistics (CRVS) systems are insufficiently complete to fill the data gap. Over the next decade(s), reaching universal death registration will be essential for strengthening the response to pandemic in LLMICs. Meanwhile, interim tools are needed to assess excess mortality due to COVID-19. Surveys that constitute primary sources of mortality data are too infrequent for that purpose in the country. These in-person inquiries also pose significant health risks in the context of COVID-19 as they involve face to face interactions with several respondents, and cross country travel. Mobile Phone Surveys represent the most viable alternative approach to safely generating timely data on excess mortality. The paper suggests different approaches to measuring excess mortality using MPS. Method: Several considerations in the planning of MPS aimed at measuring excess mortality during the COVID-19 pandemic period were reviewed by extensive desk reviews of literature and secondary data.

India with limited CRVS systems lack information to monitor the effects of COVID-19 on mortality. MPS have potential to provide such information and thus inform interventions and programs. With high penetration of mobile phones and limited cost of MPS, frequent mortality MPS should be included in plans.

### **T2A.2**

#### **Is Digitalisation a Solution to Socio-Economic & Health Related Challenges of Future Pandemics?**

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Human development is comprised of three dimensions namely education, health and economy. All these three dimensions face serious challenges whenever any disaster or pandemics occurs. There is not only the spread of infection or loss of lives but also drastic impacts on socio- economic and health-related needs of the population. Hence, this paper attempts to highlight the challenges faced due to COVID-19 and possible solutions for future pandemics through empirical evidence. The objective of this paper is to highlight the socio-economic and health-related challenges faced during COVID-19 and use of digital technology in combating them. The paper has also highlighted the digital divide to the extent of digitalisation in India. An online survey following simple random sampling is conducted and a total of 301 respondents are being analysed using univariate and bivariate analysis. NSSO 75th round and NCRB report-2019 is referred for secondary data. The findings of this paper indicated that education, economic and health-related needs are severely affected due to COVID-19 and a major segment of possible has gone online to cope up with challenges. But the access and knowledge of the digital platform are quite low in all states of India and among all age groups. Also, there is a strong digital divide visible between rural and urban areas. Further, there is serious concern regarding online safety looking at the rising cybercrime cases. It can be concluded that digitalisation can be a solution to future pandemics if access and knowledge of the digital platform are encouraged and online safety is ensured. Government interventions are required to make digital platform strong, transparent and reliable for future pandemics.

### **T2A.3**

#### **Tele-monitoring continuity of Adolescents and Women's Nutrition Services Delivered by**

## **Women Collectives during the COVID-19 Lockdown: Results and Lessons from Swabhimaan Impact Evaluation Sites in Rural India**

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COVID-19 disrupted delivery of nutrition services. It was critical to understand impact on field activities to inform programming. Health risks posed by the virus however, meant data collection had to be adapted. We set up a tele-monitoring process to assess continuity of maternal and adolescent nutrition services delivered by women collectives under Swabhimaan, a multi-sectoral integrated nutrition programme, and their role for COVID-19 response in rural Bihar, Chhattisgarh and Odisha. A rapid, retrospective, concurrent process was designed. Programme monitoring formats were adapted for telephonic interviews with women's collective representatives (N=370) and self-administered online questionnaires for programme staff (N=12) across 5 intervention blocks in May-June 2020. Women collectives in villages with low cell-phone network coverage were excluded from sampling frame. Descriptive analysis was conducted. Qualitative notes were manually coded and analysed. Home visits for nutrition counselling, delivery of antenatal care, and food ration through public distribution system were continued through convergent action with frontline health workers and Panchayati Raj Institutions. At-nutritional risk women and adolescents were supported with nutri-garden development (71%), and linkage to agri-poultry, social protection schemes. Women's collectives led awareness generation (65%), surveillance (60%), hand washing demonstrations (94%), production and distribution of soap, masks, sanitizers (67%) and gap-fill for nutrition and on-the-spot feeding programmes by producing nutrition supplements (21%). Tele-monitoring enabled timely situational awareness in low-technology areas. Familiarity with data collectors and process indicators minimised non-response and enabled a completion rate of >97%. Data collectors' gender and scheduling interviews around women's domestic and agricultural work impacted quality of interviews.

### **T2A.4**

#### **Constitutional Implications of Panoptic and Synoptic Gaze on Population: An Inquiry into Data Collection during Pandemic**

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This paper engages with the constitutionality of the panoptic and synoptic gaze over individual families and risk groups by the Westphalian state in collaboration with international financial institutions and big data firms. The data collection and classification of the humans and the "nominally humans" in commerce and in the public sphere has a relationship with natural right to human dignity, especially of the marginalized communities. To ascertain the implications of indiscriminate data collection on recognized natural and constitutional rights Research The paper undertakes a survey of laws on data collection and related case laws and state's benign responses with reference to the pandemic. It uses comparative research approach. The paper draws inference about the implications of social policies guided by technological determinism in a situation where law making is unable to keep pace with the fourth industrial revolution. It draws lessons from the emerging responses towards datafication of human and nominally human populations. The paper makes a case for meeting the unmet regulatory challenges because this pandemic is not the first instance in which state is being used by the beneficial owners of new technologies to undermine the interest of communities of same fate with same constitutional rights.

### **T2A.5**

#### **Rapid Need Assessment for Accessibility of Digital Education during COVID-19 Pandemic**

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Mobilizing communities and identifying students for enrolment into the community learning centers was complex and challenging. Aim: Rapid need assessment for bridging the digital divide in education during COVID-19 pandemic through “Community Learning Centres”. Providing continuity of education and mental wellbeing support to school aged students living in urban slums in selected cities in India. KHUSHII set up 6 community learning centers in Delhi, Bangalore, Haryana, Punjab, Rajasthan. Sites were purposively selected around KHUSHII’s education project geographies. Community need assessment was conducted using: face-to-face, telephone surveys with COVID-19 preventive measures. Households were selected randomly; data was collected using Google forms. Total 17,728 parents were interviewed. Appointing data enumerators was a challenge. Thus recently passed class 12th students, willing to work were appointed and trained. Monetary benefits, competitive salaries were given for better staff retention. Respondents refused face-to-face interviews due to threat of contracting the disease & unrest due to Government COVID-19 testing. To overcome challenge, telephone numbers of the respondents were recorded. For those subjects whose data could not be obtained during face-to-face survey, school groups were approached and requested to add our coordinators in student-teacher WhatsApp groups. Poor internet connectivity was an obstacle in conducting survey. Telephone surveys were thus conducted after taking prior appointment from respondents. Less time was available for telephone interviews due to respondent fatigue. The questionnaire was shortened. Periodic Wellbeing calls were conducted by psychologists to keep the respondents motivated. Mixed-mode surveys offer greater flexibility in the COVID-19 situation.

**T2B: Health Care Utilization -II**  
**T2B.1**

## **Effect of COVID-19 Pandemic on Delivery Care Services: A Review**

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COVID-19 pandemic has impacted the healthcare demand and supply due to mitigation strategies adopted by countries. Institutional deliveries were threatened during the COVID-19 lockdown. Skilled birth attendance reduces maternal, perinatal and neonatal mortality, but disruption of services may lead to unattended pregnancies and increased health risks for the mothers, who may experience difficulties in accessing services due to transport disruptions and lockdown measures or be reluctant to come to health facilities due to fear of COVID-19 exposure. Objective: To review the effect of COVID-19 pandemic on institutional delivery care services. Extensive search was undertaken between Aug 2020 to Oct 2020 on the PubMed database for researches, using “COVID-19 pandemic” with “lockdown” and “institutional deliveries” as keywords. Relevant articles were reviewed for the study. Few studies were found pertaining to effect of COVID-19 pandemic on institutional deliveries. In Nepal, institutional childbirth reduced by >50% during lockdown while the institutional stillbirth rate and NMR increased by 1.5 times and 3 times, respectively with a decrease in quality of care by 13.4%. In India, according to HMIS indicators for the months of April- June, percentage of institutional deliveries to ANC registration has decreased by 4.4% from 2019 to 2020. In a study, it was estimated that due to COVID-19 lockdown, there can be an increase of 8.3–38.6% in maternal deaths per month, across the 118 LMICs due to reduced essential maternal interventions. In Pakistan, data from health systems indicate a dramatic drop in access and provision of antenatal care services. COVID-19 pandemic had indirect effects on healthcare services which will underscore the progress made in decreasing the maternal mortality so far. Safeguarding the services based on evidence of what works is important, so that the gains are not reversed.

### **T2B.2**

#### **Impact of Lockdown among Urban Residents in Kumbakonam**

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The first case of corona virus was documented by china in Wuhan Hubei Province in December 2019. Later this kind of novel virus was confirmed in the six continents more than 100 countries. The world health organization and other agencies taken steps and new information was released daily. Within the next 3 to 4 months of time new cases have been decreased reduced in China but Italy and other developed countries faced exponential increases followed by South Korea, USA and Iran. Hence, the countries affected by COVID 19 took various steps one among them lock down. This lock down lead to influence on physical movement of the person out of the home, social distancing when outside the home, and restricted availability of most public services, while sparing essential services. ? To understand the socio-economic and demographic characteristics of the respondents. ? To examine the sources of information on Covid-19. ? To analyse attitude and perception of the respondents in the study areas. The study was conducted in Kumbakonam town which is located at North East of the Thanjavur district. It is bounded by the river Kaveri and Arasalar and acts well connected with important towns and cities in Tamil Nadu. Data was collected using a schedule from 23 wards with non-proportional sampling method. About 11% of the respondents were below 20 years; It was observed 14% of the respondents were stressed at the commencement of lockdown; whereas about 31% of them reported that as they were calm; 48% of them were neither calm nor stressed. So it is clear that the majority of the respondents that interviewed were not stressed before lockdown. But most of the respondents were reported that heavily stressed due to continuous lock down.

### **T2B.3**

#### **Impact of COVID-19 on TB Notifications in India**

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COVID-19 epidemic and measures like lockdown in response to it have affected all aspect of human life including healthcare, such as Tuberculosis (TB) interventions. Here an attempt has been made to trace the number of notified TB cases before, during and after COVID-19 lockdown was imposed, and then compared with same period of previous year. The real-time epidemic data on notified TB cases for 2019 and 2020 were extracted from NI-KSHAY database and conformed COVID-19 cases were extracted from COVID19- India API website. The absolute and mean numbers of weekly TB notifications from the 1st through 35th week for the year 2020 were compared during the same period in 2019. With the surge in the COVID-19 cases there is a significant decrease in TB notifications in India. Especially, when the lockdown and related restrictions in response to COVID-19 was imposed, TB notifications were significantly decreased (-56%) compared to same period during the previous year. Further, very sharp decrease was observed during first four weeks of lockdown. Further, numbers of TB notifications during post-lockdown are still more worrying. Though, little increase was observed in TB cases/week sudden after lockdown was removed, but then-after again consisted decrease was reported; and these numbers again substantially lower than the previous years. Adequate measures to diagnose, control, and prevent TB should be implemented simultaneously with response to COVID-19 pandemic. Further, effective steps should be taken to remove the fear arise due COVID-19 pandemic among masses, so that the healthcare seeking may improve.

#### **T2B.4**

#### **Healthcare Seeking Behaviour during the COVID 19 Lockdown in an Urbanized Village in Delhi: A Cross- sectional Study**

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In response to COVID-19 pandemic the Government of India announced country-wide lockdown on 25thMarch2020 for 21 days and later extended it till 31stMay2020. Fear and apprehension in the community about accessing non-COVID services would have affected healthcare-seeking behaviour. To study healthcare-seeking behaviour of residents of an urbanised village during COVID-19 lockdown. Methodology UHTC(Urban Health Training Center), Aliganj caters to over 6000 population in an urbanized village of South Delhi. We used pre- designed semi-structured questionnaire covering sociodemographic detail and health-seeking behaviour. The study population was adults who regularly sought healthcare from UHTC. We used systematic random sampling to select patients attending UHTC during November-December 2020 and analysed data in SPSS. Of 218 patients 198 required consultations during lockdown, of which 116(58.5%) accessed alternate government health facility, 58(29.2%) accessed a private clinic while 2(1%) opted for teleconsultation. 88(44.3%) of the patients bought medicine from private pharmacies and 78(39.7%) from government supply points. A total of 113 patients reported to have not taken medication previously prescribed from UHTC. The reasons cited were unavailability of medicine in pharmacies [49(43.3%)], expensive drugs [47(41.2%)] and migration to the village where medicine was unavailable [17(15%)]. Out of 87 patients with non- communicable diseases 38(43.7%) procured medication from private pharmacies and 37(42.5%) from govt supply while 6(6.9%) stopped taking medicine. 29.2% of the study population visited private clinics during the lockdown for consultation they would have otherwise obtained at UHTC. 44.3% of the patients bought medicine from private pharmacies resulting in out-of-pocket expenditure. There was low uptake of telemedicine service. Unavailability and cost were barriers to taking prescribed medicines.

## **T2C: Utilization of RCH Services during Pandemic: Collaborative Studies of IIPS and PRC**

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After completing a four-week training program for the 18 population research centers (PRCs) in 2020 that covered 11 different themes on various aspects of undertaking scientific research and paper writing the coordinators who undertook a 3-day training course on “Designing the Survey Instruments” initiated to undertake a multi-centric research study to the participating PRCs. Seven PRCs, viz. Bangalore, Dharwad, Guwahati, Kerala, Kashmir, Patna and Pune joined the initiative and the study began. The aim of the initiative was to strengthen the capacity of the PRC staffs and translate learnings of the various training programs effectively for their usage. It decided to share the same with all other PRCs. This would facilitate use of standardized research approach, design and tools across PRCs for studies on a specific theme and allows comparison and analysis to gain deep insights of the issues covering different geographies. It was decided to choose a theme of the study from the list of studies suggested that the Ministry of Health and Family Welfare (MoHFW), Government of India to the PRCs for the year 2020-21. All participating PRCs decided to undertake the study exploring “*Utilization of the RCH services during the pandemic*”. The study was implemented in one district and interviewed 500 women aged 15-49 years. The study adopted multi-stage sampling design for the selection of the women to be interviewed for the study. The data collection was undertaken during the months of November 2020 – February 2021. The project period for the study was nine months (July 2020 to March 2021). The preliminary findings of the study from four PRCs (Dharwad, Guwahati, Jammu and Kashmir, and Patna) are presented in this technical session. The study results for Maharashtra could not be included as the data collection in the state was delayed due to the on-going pandemic. The data collection was completed in the month of February and the data entry is in near completion. The study could not be conducted in Kerala due to non-approval at the state level. The preliminary findings of the study on the themes of a) antenatal, natal and postnatal care, contraceptive services, child immunization/vaccination, child health care, ICDS, and are discussed in this session.

## **T3A Spatial Pattern of Pandemic**

### **T3A.1**

#### **An Assessment of Covid-19 Strategies for Selected States of India: Lessons Learned for Future Pandemics**

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COVID-19 pandemic has severely affected the world and the impact is not uniformly distributed and among varying socio-economic, demographic and epidemiological characteristics of population. Government has undertaken strategies to prevent the adverse impact of COVID-19. Hence, this paper attempts to critically analyse the government's strategies in regions of India having varied vulnerabilities. The objectives of this paper are to identify the strengths, weaknesses, opportunities and threats of COVID-19 response model of selected states of India to highlight the lessons learned for dealing with future pandemics. Also, emphasis has been given to analyse the role of vulnerabilities as part of government's strategies. A SWOT analysis has been performed in this paper of three states of India. The selected states are Madhya Pradesh, Telangana and Nagaland having highest overall COVID-19 vulnerability index among the EAG, Non-EAG and North-Eastern states respectively as formulated by Acharya & Porwal, 2020. The information and data have been collected through government websites of each state and several reports like Rural Health Statistics, National Health Profile etc has been referred. The findings of this paper reveal that the EAG states of India have higher socio-economic vulnerabilities; on the other hand, Non-EAG states have higher demographic and epidemiological vulnerabilities. The government response model of each of the state largely followed the government guidelines rather than assessment of their own community needs. Less efforts have been made to address the state-specific vulnerabilities. It can be concluded that there is a need for region-specific strategies for combating the pandemic as each region have their own different needs and vulnerabilities. Further, identified strengths and opportunities should be encouraged and attention should be given on weaknesses and threats.

### **T3A.2**

#### **Epidemic Vulnerability Mapping based on Demographic and Household Census data A Case study of Tiruchirappalli District, Tamil Nadu**

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Over the past few decades India, like many other countries, has witnessed major social, demographic and economic change due to the economic restructuring in the early 1990s. These changes have recorded a great impact on household income and the lifestyle, while this phenomenon is not witnessed by the rural population. They lack multiple basic amenities like housing, water, sanitation, electricity, education etc. The effect of economic restructuring has been reflected in many of the socio-economic components of the country. Economic change in India, to a larger extent, is associated with growth and as well as disparities among urban and rural. The demographic, socio-economic data are very vital to reveal, understand and make policies and plans to alleviate the disparity. However, the potential application of the census data is enormous, one such study is to map the vulnerable areas for an epidemic outbreak. The compilation of the various census data components like population density, literacy, workers, household information etc could help in mapping the vulnerable areas for the spread of a disease. Tiruchirappalli district is the geographic center point of Tamil Nadu state. The district consists 9 Taluks (Including Tiruchirappalli Corporation), 3 municipalities and 507 villages. The present study is focused to derive hot spots of demographic and household characteristics of the region to understand the spatial patterns and clusters of the vulnerable zones of epidemics. Hotspot analysis (Getis-Ord  $G_i^*$  statistics) is a prominent technique to effectively calculate significant clusters of Hot spots (high values) and Cold spots (low values). The study revealed that 132 villages in Tiruchirappalli district are highly vulnerable for spread of COVID19 like diseases. The study will help the policy makers to take necessary actions to improve the prevailing socio-economic condition associated to public health, to alleviate the disease outbreak.

### T3A.3

#### **Geographical Analysis of Covid 19: Its Relationship with Socio- Economic Conditions In India**

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Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), emerged in late December 2019 in Wuhan City, Hubei Province in China and caused a typical pneumonia called coronavirus disease 2019 (COVID-19). It has spread across the entire world and affected people of all ages. The WHO declared COVID-19 as a pandemic on 11 March 2020. This disease is characterized by fever, cough, fatigue, and ground-glass opacity on chest tomography etc. This paper emphasizes on the spatio-temporal variations of total confirmed cases, active cases, recoveries, corona deaths, testing rate, age-sex composition of corona deaths, age-wise distribution of corona cases, the relation of total corona cases and total corona deaths with different socio-economic indicators such as number of covid testing labs, female literacy, male literacy, length of roads, population density, number of hospital beds, number of hospitals, number of ICU beds, number of ventilators, per capita income, rural literacy, urban literacy, total testing, total literacy, elderly population and the socio-economic effects of corona in India. The data has been obtained mainly from secondary sources, e.g., Census of India, 2011, Ministry of Health and Family Welfare, Center for Disease Dynamics, Economics & Policy, World Health Organization. The relation of socio-economic indicators with total corona cases and total corona deaths has been established with the calculation of z-scores and composite z-scores. Maps have been prepared using ArcGIS 10.7. In the study, it was found that states with better socio-economic conditions recorded higher corona cases and states with poor socio-economic conditions recorded lesser corona cases. States such as Maharashtra, Kerala, Andhra Pradesh, Tamil Nadu and Karnataka with better socio-economic conditions recorded more number of corona deaths. States such as Arunachal Pradesh, Sikkim, Meghalaya, Nagaland, Manipur, Mizoram with less elderly people recorded lesser corona deaths.

### T3A.4

#### **Migration and Informal Sector Scenarios during Covid 19 in Odisha: A Spatial Dimensions of Vulnerability Analysis**

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Migration and Informal Sector Scenarios during Covid 19 in Odisha: A Spatial dimensions of Vulnerability Analysis The COVID-19 crisis has the potential to push around 40 crores of informal sector workers in India deeper into poverty, with the lockdown and other containment measures affecting jobs and earnings. (ILO). Around 90 % or 419 million of the total 465 million workers are engaged in informal sector with 95%, and 80% in rural and urban areas respectively. 92% informal workers engaged in non-agriculture sector in urban area likely to be impacted more by the lockdown due to halt in economic activities in cities such as industrial and business activities. In this paper, we estimate the number of most vulnerable informal workers and migrants by three ways (i) the most affected sectors; (ii) status of work and (iii) vulnerable occupations, where they are engaged in urban areas. The present paper has two major objectives. Firstly, analyse the informal sector workers and migrants in urban Odisha at regional and industries, and across different employment status such as self-employed, casual and regular workers and to show lives and livelihood of migrants and informal workers and identify vulnerability during covid 19 in different regions of Odisha. Methodologically, the research draws upon secondary database with the help of NSSO 68th round Employment and unemployment survey, 2011-12 and primary database during covid 19.. Vulnerability Mapping in ArcGIS, Unit level data extraction NSSO 68th Round informal workers, Flow Analysis and Herfindahl's Index has used for see the concentration of worker in particular industry. Principal component analysis and Gini coefficient used to measure the level vertical as well as horizontal variations. The regional dimensions of vulnerability showing a complex nature of socio-economic and cultural set up in Odisha

T3A.5

**Spatial Pattern of COVID-19 Cases and Mortality Rate in Odisha: A Regional Analysis  
(2020-21)**

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The Covid-19 pandemic is not over yet, it has become a serious global issue. The infection and mortality caused due to the spread of Covid-19 need urgent and proper vaccination process to be optimized in due time. Though various vaccination process came in to effective globally, but still there is risk to public health. Proper monitoring of the Covid-19 pandemic by regular review on its spread, infection, mortality, migration, vaccination process as well as checking up on economic stability are the growing concern for present scenario. Here, the investigation has been made upon the spatial and temporal pattern of Covid-19 cases and mortality rates at the district level. The spatial analysis has been made using GIS software to develop a general model of scenario of number of confirmed cases in each month. Correlation and regression analysis has been performed to find the relation between Covid-19 cases and mortality.

## **T3B: Impact of Covid19 on Lives of People-I**

### **T3B.1**

#### **Impact of COVID 19 on Adolescent Health: Preliminary Evidences from Kerala**

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The pandemic and subsequent lockdown has created a sense of distress and uncertainty which has led to short as well as long term health, well-being, mental health and psycho-social implications. Among various groups, adolescents are more vulnerable and susceptible to psycho-social impact of pandemic because of extended stay at home, lack of peer socialisation and online education. In this context, the aim of this study was to explore the daily life patterns of adolescents during their extended stay at home and online schooling. A study was conducted in Kerala to explore and understand their physical/emotional health problems including the risk and protective factors. A total of 216 adolescents were part of this study. The research followed a cross-sectional quantitative approach. The data was collected using Google Form which was circulated between 13th Oct-13th Nov 2020. The tool had 62 items focusing upon current daily routine of adolescents, study pattern, internet use, health and mental health problems. The analysis clearly showed that most adolescents had no stable routine, and very little time (less than 30 minutes) was dedicated to physical activities. In the present study, impacts of the pandemic on adolescents' physical and mental health was alarming. Regarding physical health, data showed that more than half of the sampled adolescents had developed one or another kind of physical health issues. Also, 50 percent of the adolescents reported that they had gained weight during the pandemic. We observed that adolescents' mental health was poor. Most adolescents had psychosomatic issues like lack of interest, low energy level, disturbed sleep, lethargy, and social withdrawal symptoms. The study portends the need for initiating counselling services for the adolescents as well as parents apart from starting short training programs for teachers in order to limit the negative impacts of the pandemic.

### **T3B.2**

#### **Mental Health Status and Psychological Impact of the Covid-19 Pandemic on Frontline Nurses during the COVID-19 Pandemic Outbreak in India**

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Across the world, nurses are playing a critical role in saving the lives of people in the fight against the COVID-19 pandemic. Nurses being simultaneously at the forefront of direct patient care and having significant clinical responsibility, are perhaps the most vulnerable in this situation. Nurses experienced unparalleled levels of workload and burden since the outbreak of COVID-19. Not much is known about its impact on the psychological impact of medical care workers and related factors in India. The aim of this study is to understand the Mental Health Status and Psychological Impact of the Covid-19 Pandemic on Frontline Nurses During the COVID-19 Pandemic Outbreak in India. A primary data was collected including 530 samples, residing in Kerala and Maharashtra in July 2020. An online survey was completed through google form. This study used the Depression, Anxiety, and Stress Scale (DASS-21) to measure mental health, while the Event Scale-Revised (IES-R) 22 items were used to measure the Psychological Impact (Posttraumatic Stress Disorder) of the Covid-19 pandemic. The nurses involved in covid-19 care had higher percentages of depression (28.0%), anxiety (45.5%) and stress (17.4%), as compared to those who were not involved in COVID-19 care 13.4, 17.4 and 8.7% respectively. The Posttraumatic Stress Disorder (PTS) was higher among nurses who were involved in covid-19 care (20.3%) as compared to nurses who were not involved in covid care (8.0%). Healthcare workers in a variety of fields, positions, and exposure risks are reporting, depression, anxiety, stress, and posttraumatic stress disorder during the covid-19 pandemic. Future interventions at the national and organisational levels are needed to improve mental health during this pandemic by preventing and managing depression, anxiety and stress, providing sufficient social support, and ensuring front-line work willingness.

### **T3B.3**

#### **Psycho-social Factors Associated with the Nationwide Lockdown in India during COVID- 19 Pandemic**

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To investigate the psycho-social factors associated with COVID-19 and the nationwide lockdown in India. Study design An online survey was conducted from April 11 through April 16, 2020 in 28 states and 8 union territories (UT) of India. The potential participants were recruited using snowball sampling procedure. A cross-sectional online survey was conducted among the people of all states in India. A spatial analysis was performed and Moran's I statistic was applied to investigate the overall clustering of locations. Fisher's exact test was used to investigate associations. GeoDa and R console were used to analyze the data. A total of responses were received. Those worried for their family's health were likely to follow the lockdown measures. Significant association was observed between following the lockdown measures and being satisfied with the government strategy to combat the COVID-19 pandemic. A significant relation was observed between the gender ( $p = 0.001$ ), job profile and physical activity were observed to be associated with the psycho-social impact. Government and public health officials should consider the sentiments of the community while planning strategies relating to the pandemic. The findings of this study will assist the policymakers in emphasizing the psychological well-being of individuals, along with physical health.

### **T3B.4**

#### **Covid 19 Lockdown Obligatory: An Exploration on Public's Perspective in Suburban Region of Northern Tamilnadu**

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Rapidly spreading COVID-19 pandemic, lockdown, weak governance in the healthcare system, insufficient medical facilities and sharing of misinformation in mass media has led to fear and anxiety among people. This study intended to assess the COVID-19 related human stress and its' associations with other relevant factors affecting quality of life during obligatory lockdown period in Northern Tamilnadu. Methodology: This phone based cross-sectional survey was conducted among adults who are residing in the urban field practice area of tertiary-care medical college hospital. We recruited 480 participants through 2 stage process using updated family survey register maintained with phone numbers. Perception-based pretested and semi- structured interview questionnaire with 4 domains namely, Mental health, socio-economic crisis, healthcare system and political measures and impending environmental issues including demographics was used to collect data and scored accordingly.

Frequency distribution, t test and multivariate linear- regression were utilized to analyze the results. A total of 400 (males – 66.2%, females – 33.7%) participated with valid responses. The mean age was  $34.59 \pm 13.8$ . About 96.7% of the respondents were in COVID-19 related mental stress. Only 18% had firm faith on political and healthcare system in combating pandemic. Most (93.9%) had perceived severe socio-economic stress due to lockdown. Moreover, 36.7% anticipated climate change induced disasters and infectious diseases causing further healthcare crisis. Linear –regression model demonstrated that unemployed and unskilled workers, male gender, >35 years of age were significantly associated with higher perception scores. Obligatory lockdown has created psychosocial and socio-economic insecurity among people; government should take inclusive steps for risk assessment, communications and financial stimulus to alleviate the fear and anxiety.

### **T3B.5**

#### **Prevalence of Mental Health Issue during the Covid-19 Pandemic: A Systematic Review and Meta- Analysis**

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The Covid-19 pandemic has affected the mental health of the people directly and indirectly. It is a major public health concern during these times. The virus has various psychological outcomes at the individual as well as at the community level. During these uncertain times, people have faced fear, anxiety, stress, and depression. In this study, the pooled prevalence of various mental health issues will be calculated. To do the systematic review and perform the meta-analysis, articles were searched on various research databases such as PubMed, Google Scholar, Science Direct, Scopus, and Elsevier. Search has been done with the keywords- “Mental Health Disorder”, “Mental health issues”, “Covid-19”, “Stress”, “Anxiety”, “Depression” etc. with the start of the pandemic until December 2020. Pooled estimates were calculated used fixed effect and random effect models. The heterogeneity of studies used in this analysis was tested using I<sup>2</sup> statistic. Forest plots and funnel plots with 95% confidence interval are constructed for the meta-analysis. Publication bias for the selected studies was assessed by different small study tests including the egger’s test and Begg’s test. It was found from pooled estimates of various studies that the prevalence of stress is around 31% and for anxiety, the prevalence is around 28%. Coronavirus has not only affected people physically but mentally too. Due to lockdown and other precautionary measures people were not able to take proper care and consult a doctor. Economic burden, lack of social life, and other factors played a major role in various mental health problems. Hence, it is important for the individuals as well as for the government to do some interventions for the prevention of people and to help others improve.

## **T3C: Morbidity and Mortality during Pandemic and Non-pandemic Period**

### **T3C.1**

#### **Multimorbidity and Severity of COVID-19 Disease**

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The unadjusted case fatality rate of COVID-19 at world level is calculated at 2.1 per cent. This mortality rate shows a varying pattern over different age groups, higher in old and adult age groups than adolescent and child age groups. At this point, the significant prevalence of many diseases in adult and old age groups unravels the understanding of the variation of mortality rate attributable to COVID-19 disease. A systematic review and a meta-analysis of hazard ratio/rates and odds ratio from peer-reviewed articles were performed to understand the risk or effect size of multimorbidity (13 diseases) on the severity of COVID-19 disease. These peer-reviewed articles found out mainly noncommunicable diseases showing significant high risk for COVID-19 disease. A random-effect model was applied to estimate the effect size that allows comparison of morbidities affecting the severity of COVID-19 disease. The results show the effect size of the hazard ratio of each 13 diseases computed from meta-analyses. The risk of severity for COVID-19 disease is the highest for degenerative diseases such as Coronary heart disease and Cardiovascular disease followed by Heart disease, Chronic kidney disease and Coronary artery disease. Also, Diabetes mellitus and Hypertension show high risk for severity of COVID-19 disease. Compared to these diseases, other diseases such as respiratory diseases, Obesity, Cancer, and Chronic obstructive pulmonary disease show significant and lower effect size. The study unravels that the prevalence of noncommunicable diseases in adult and old ages increases the severity of COVID-19 disease more than that of comorbidity.

### **T3C.2**

#### **Is Childhood Mortality Higher in Urban Poor than in Rural India?**

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Regarding the identification of urban poor, income-differentiated mortality raises a twofold challenge which leads to a paradox. Poor persons tend to die, on average, earlier than non-poor. The present paper examines the childhood mortality differential among urban poor and rural India using data from NFHS 2005-06 and 2015-16. Concentration index (CI), and cox regression were applied to address the research problem. Furthermore predicted probability was used to identify the potential predictors of infant and under-five mortality after adjusting the predictor variables. The findings suggest a decreasing trend in infant mortality and under-five mortality both urban poor and rural India during this period. The economic inequalities respect to under-five mortality is higher in urban poor than in rural India. Hazard regression suggested that higher risk of child mortality in urban areas, due to poverty, low female literacy, low coverage antenatal care and safe delivery in the community. Even after controlling the possible bio-demographic variables, the study reveals that percentage declined mortality in rural areas higher than the urban poor but inequality is more widened in urban poor in India. The health program should be initiatives a major role to reducing infant and under-five mortality rates for both urban poor and rural India.

### **T3C.3**

#### **Examining the Association between Socio- Economic Components and COVID-19 Fatalities in India**

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There are serious concerns about the nature and transmission of the Covid-19 pandemic. The COVID-19 has created a national threat and health crisis that is dispersal rapidly in India as well. In the initial phase, the pandemic of Covid-19 has covered highly globalized and developed states and regions of India i.e., Kerala, Maharashtra (Mumbai), Delhi, etc. But over a period of time, the tentacles of the Covid-19 have spread to all Indian states and acquired regional patterns with different magnitude and cause-effect relation. Thus, to overcome the crisis situation, there is a need to understand the special features and causes of COVID-19. Therefore, the main objective of this paper is to analyze the growth pattern and nature of Covid-19 in Indian states and also identify the main factors which have influenced the growth pattern of Covid-19. For this purpose, a set of indicators has been chosen for analyzing logistic and multivariate linear regression models.

To examine how the spread of covid-19 differs from one state to others, a cluster analysis has been made at the state level, using appropriate indicators. The study is based on secondary data that have been taken from different sources. This study finds that the distribution of the COVID-19 confirmed cases and deaths were found uneven across India. The selected demographic and socio-economic components, including total population, urban population, poverty, income, are the key factors in regulating overall casualties of COVID-19 in India.

### **T3B.4**

#### **Vulnerability Factors of Pre- existing Under-five Childhood Morbidity in Bangladesh, amidst the COVID -19 pandemic**

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Although children are not the face of the COVID-19 pandemic, the indirect effect caused by this universal crisis can be lifelong for them. With COVID-19, immense pressure is expected on Bangladeshi children who are already facing an alarming situation in pre-existing under-five childhood morbidity conditions. The present study uses data from the Demographic and Health Survey of Bangladesh (BDHS 2017-18) to understand the different vulnerability factors of pre-existing morbidity conditions in under five Bangladeshi children and relate them with the potential impact of the COVID-19 pandemic. A total of 8398 children aged below 5 years during the survey from mothers aged 15-49 years in Bangladesh are selected as an analytical sample. Bivariate and multivariate analyses were performed to understand the vulnerability factors leading to diarrhea, fever, cough, and acute respiratory infections (ARI) within two weeks before the survey. We found that male children were 1.20 times more likely to experience comorbidity compared to their female counterparts. Children aged one year were 1.58 and 2.20 times more likely to experience single morbidity and comorbidity compared to children aged four years. Moreover, children coming from households that drink treated water are found to have 1.31 and 1.05 times higher likelihood of experiencing single morbidity and comorbidity respectively. Further, it is observed that children have 1.41 and 1.68 times higher likelihood of comorbidity during the monsoon season in comparison to the summer season. The nation-wide lockdown due to the COVID-19 pandemic had not only isolated the people from physical communication but also disrupted the health care facilities to care for the preexisting morbidity condition among Bangladeshi children. Daily hygiene habits of individuals and continuum of care through health facilities may prove effective mitigation strategy for under-five children during and after the COVID-19 pandemic.

### **T3B.5**

#### **Is Communication Key to Good Health? Understanding the Depressive Symptoms, and Associated Morbidities during Pandemic**

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The situation of pandemic has created an increased demand for healthcare and especially for the morbidities associated with the psychiatric conditions. This study is an attempt to understand the dynamics of the communication strategies which is a grey area when it comes to the healthcare sector. The study derives the evidences available from the literature and tried to explore the association between the various psychiatric morbidities which has occurred due to Pandemic and lockdown. The study is a mixed method study, based on the primary data collection and narratives drawn from the available literature. A structure questionnaire was administered among the study participants in the age group between 18-65 years. The study was conducted in Trichy city and its peripheries of Tamil Nadu State. Study indicate that during the lockdown period majority of the households in India has experienced the social isolation, lack of social networking and lack of inter-personal communication causing depression, anxiety, and other psychological conditions. The study suggest that communication and interpersonal skills are the major factor which needs to emphasized while dealing with psychiatric and other mental health conditions. The ways to connect with the family members, availability of internet access/connectivity and level of education was significantly associated with the consistent social networking. The lack of long term contact with the family member, relatives, and friends increased the chances of Depression and anxiety among the households. Alternative mechanisms had played an important role in coping strategies for the psychiatric conditions among the households.

## **T4A: Migration and Pandemic**

### **T4A.1**

#### **Elderly Migration in India: Pattern, Characteristics, Reasons for Migration and Systematic Review of COVID-19 Impacts on Elderly Migrants**

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With the increase of old age population in India, is poised to become one of the most significant social transformations of the twenty-first century. In December 2019, a novel coronavirus known as COVID-19, has emerged in Wuhan city of China and spread their wing all over the world. In India, due to lockdown people faces many problems specially migrated person of all age groups. In India mainly focused on labor and child aspect of migration related issues and few studies have been done related to age pattern or age selectivity migration in India. (1) To examine the pattern and their reasons for migration. (2) To evaluate the impact of covid-19 and lockdown on elderly migrants of India. Census data of India used in this study for the examining and exploring of elderly migration in India. For the systematic review of impacts of covid-19 on elderly migrants, we used the Google Scholar, jstor, researchgate, PubMed and various online resources platforms. More than half of the elder populations in India are migrants, but it is less than young age migration in terms of total numbers. The dominating reasons for elderly migration are moved with house hold, others and marriage. The COVID-19 makes both positive and negative impact on all age group. However, older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer were more likely to develop serious illness. When the elderly people move they face many problems at the place of destination such as family support, health, housing, living cost, amenities and climate. The migration at old age is determined by later-life movement, so better understanding of elderly migration of any particular region is helpful for policy makers and programme implementations in various aspects of development.

### **T4A.2**

#### **The Future Aspirations and Socio-economic Profile of the Return Migrants during Pandemic to Sonitpur District of Assam**

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Assam is an out – migrant state from northeast. According to census 2011, there are total 406,000 out migrants from Assam. This figure is gross underestimation of the actual number of people who migrate out for work. Census and sample surveys fail to capture the seasonal and circulatory nature of labor migrants in India. According to census 2011, 27.6 percent out – migrants cite work as the reason for migration. The SARS- Covid 19 caused large humanitarian and social catastrophe and potential health catastrophe and migrants laborers were hit the hardest. Migrant laborers, most of who work in informal sector without any social and job security, were rendered jobless and forced to return from their ‘destination’ to ‘source’ areas. The actual tally on the return migrants is not known. Large chunk of return migrants foot slogged the entire distance during 23th March when the first lockdown was announced and resultant closer of all public transport to 1st May when the railways started special trains to carry migrants. We have collected data for Sonitpur district in Assam and we aim to understand the profile of the return migrants. The data collected at village level by telephonic questionnaire – based surveys gives a picture of the return migrants, their job profile and their future aspirants. At this juncture, this pertinent question one must ask is whether the migrants pose a burden on the local economy or provide a window of opportunity for the local economy to capitalize on. Some studies have already pointed the possibility that return migrates will usher in social unrest in ‘source’ areas. In order to avoid any such social unrest and reinstating the return migrates in workforce, understanding the socio – economic profile is important. Our data at the micro level provides the added evidence that the epidemic has reinstated the existing inequalities.

### **T4A.3**

#### **Impact of Covid-19 on the Migration and Remittances in India**

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The covid-19 pandemic that started to spread in India and World in January 2020, had affected 101 billion worldwide including 2.2 billion deaths till 30th January 2020 (WHO, 2021). In India, the confirmed case to date is 1.0 billion and death is 1.5 million. During the year the pandemic has largely affected the world economy as well as India. As a result of the pandemic, the economic growth of the world fallen and for which reverse migration become a common phenomenon. Further, the pandemic also impacts the remittances sent by the developed countries to the undeveloped and developing countries. Therefore, most of the migrated people returned to their villages in India due to shutting down the cities. India more than 100 million people were worked in the factories and industries of the city areas. Owing to pandemics they returned to their villages and involved in agricultural activities. However, the income of the migrated workers reduced due to the pandemic, although the agricultural activities active during a pandemic. Due to the pandemic, the remittances also impacted. As to the report of the International organization of Migration, the remittances to India fall by 9 percent to dollar 76 billion. All over the world, remittances shrink to 14 % in 2021. In this context, the paper trying to focus on the Impact of the covid pandemic upon Migration and Remittances. The paper mainly based on secondary information collected from various organizations like International Organization for Migration, and various newspapers. Data collected has been analyzed using SPSS and simple descriptive methods. The results obtained are revealed that the pandemic leads to a reverse migration kind of situation that reduces the income of the migrants as well as affects the growth of the industries in India.

### **T4A.4**

#### **Examine the Health and Safety of Migrant Workers with Challenges of COVID 19 Outbreak in Textile Manufacturing Industries**

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Most of the workers engaged in manufacturing industrial sectors where fewer attentions on workers health and safety. Presently their working condition and pandemic outbreak is more associated and significantly affected migrant workers poor condition. This study seeks the attention of migrant workers working condition during the pandemic time and unlocks time.

During the pandemic outbreak, social and physical distance more required preventing the spread of COVID-19 virus. Moreover, it is also necessary for safety measures like use of mask and hand gloves to avoid the spread of covid19 viruses. However, most of the migrants are working without using of sanitized PPE kits and working in unhygienic conditions. In addition, they are vulnerable from respiratory diseases The research study is a preliminary and cross-sectional study covering 409 informal migrant workers in textile manufacturing industries in urban regions of Surat district. The survey started on April-November 2017, where participation was voluntary. Working conditions and working place environment questionnaires and field observations are covered to justify the conditions of the deprived group of migrant workers. The result shows that nearly 37 percentages workers have knowledge about PPE while 12.7% workers using the PPE where only 6.4% and 2.4% workers using the safety kits such as gloves and mask during the work respectively. Moreover, it is also noticed that 67 workers suffer from respiratory problems (16.4%) where 43.3% and 40.3% reported about chest tightness and shortness of breath at rest during last one year.

Now in this scenario, it is necessary to take some necessary actions with the concern of health, safety and hygiene to industrial sectors for prevention of COVID-19 spread—accordingly, need to design and implement sensitive policies concerning migrants.

#### **T4A.5**

### **Impact of Covid-19 on Lives of Children from Migrant Families in India**

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The national and state governments had implemented measures to contain the spread of COVID-19 including school closures, home isolation/quarantine and community lockdown. The objective of the paper is to understand the impact of school closures, home isolation/quarantine and community lockdown due to COVID-19 on well-being and education of children from migrant families. The study adopted a cross-sectional design and primary data was collected from those who were migrating or had already migrated back to their home state of Jharkhand due to COVID-19, through an online survey. Of 606 adult respondents (parents) and 235 child respondents (11-17 years) participated in the data collection have been done between June 20, 2020 to July 10, 2020.

About 91% households reported income loss since the onset of the pandemic. About 85% respondents reported loss of job and more than half the parents (60%) reported that they are struggling for food and 26% of the households are struggling to pay house rent. About two-third of all respondents reported the need of job / employment support. Seven out of every ten respondents cited the need for cash. Some 17% children reported violence in their homes during the pandemic.

Four out of every five children reported increase in negative feelings since the outbreak of the pandemic and 18% parents in the programme participants group reported that their relationship has improved with their children. Three out of ten parents in the reported stress or violence in household relationships about 42% children reported an increase in involvement in household chores since the outbreak of pandemic. About 43% respondents shared that they were facing barriers in accessing healthcare, medication or menstrual products. More than two-fifth (47%) of the households reported not having access to masks. More than 50% respondents who lost their income due to COVID-19 reported that they experienced difficulties in paying for healthcare or medical supplies. Loss of income due to the pandemic affected people's access to essential food items and food nutrition supplements. 74% respondents shared this concern.

Covid-19 and restrictive measures undertaken by governments have had huge implications on the rights and needs of children from families that had to undertake reverse migration. A large number of children from these families have compromised access to their education, health and protection rights. There is a need for all the stakeholders including government, civil society, community and private sector to come together and ensure rights of these children.

## **T4B: Impact of Covid19 on Lives of People-II**

### **T4B.1**

#### **Impact of Covid-19 Lockdown on Air Quality Index of Kolkata City**

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In the year 2019-2020 Covid-19 was a huge burden to humankind puzzled them to find out the cure to deal with it keeping sheer perseverance. It was the biggest pandemic ever after industrialization which restricted all the activities to closed and later confined to home. During the month of March and April 2020 we witnessed the largest scale experiment in history in terms of air quality in cities. During this unprecedented lockdown many shuffles and chaos were observed among marginalized and destitute due to shutting off the economies everywhere but surprisingly nature was recovering to its best of the days. To investigate the possible impacts of unconventional policy intervention in the form of lockdown on air pollution, seven pollutant parameters (PM10, PM2.5, SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, CO and NH<sub>3</sub>) have been analysed individually and as an integrated index. In this paper Kolkata Municipal Corporation area was chosen to study the Air Quality change during Lockdown and compared with previous time duration during usual days. Principal component analysis was applied before running the regression model as all the variables under study were highly correlated. As a result, it was found that four factors formed by original variables have significant impact on AQI and these factors together have accounted for 98% -99% of variation in the Air quality Index. Thus, we can say that during the lockdown due to Covid-19 crisis nature has wielded its power and shown resilience to cover up all the glitches caused by anthropogenic actions and observed changes have catered the demand to make a long-term sustainable policy intervention at least to reduce the pollution in cities.

### **T4B.2**

#### **Impact of COVID-19 Lockdown on Lives and Livelihood of Household Workers: A Cross-sectional Study in Murshidabad District, West Bengal**

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The government of India declared nationwide lockdown from 24th march and continued almost four-month to break the chain of the COVID-19 virus. The lockdown positively breakdown the rapid increase of COVID-19 cases but negatively affected the Indian economy and the employment status of people. The main objective was to capture the socio-economic predicaments faced by household workers in Murshidabad district West Bengal. This paper used secondary data (Census, 2011) to show the block level percentage of workers. The study selected two blocks (Suti (I) and Suti (II) block) as a study area based on the percentage of household workers. The study surveyed 150 households from selected blocks. Univariate and Bivariate techniques used to accomplish the study objectives. More than one-third of workers engaged as household workers in the study area and the majority of women (more than 80%) were working as household workers (Census, 2011). This study found that- most of the household workers were working as a bidi roller (73%), followed by other workers (17%) during pre-lockdown. Almost 80% of bidi and handloom workers became unemployed during the lockdown. The study suggested that the financial crisis was more severe than food scarcity among them. About 69% of bidi and other (65%) workers faced a typical financial crisis. Except for bidi workers, a large number of handloom and other workers (more than 80%) didn't get any aid from their company. The majority of respondents got benefits from PM Jan Dhan Yojana, Ujjwala Yojana, and CM free Ration Relief Yojana. The government initiatives played a significant role to overcome the food crisis. But, unemployment, occupational shifting, financial crisis upsurges socio-economic vulnerabilities among household workers. The study suggested there is a need to launch a special program for household workers to overcome the challenges.

### **T4B.3**

#### **Covid-19 Pandemic: A Qualitative Study of the Lived Experiences of Empty-Nest Elderly in Kashmir**

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COVID-19 has put unprecedented challenges to every person throughout the globe. Within the demographic profile, it has been extra grueling for people with multiple vulnerabilities. Among such people is the elderly population. With the advancement in the age, the elderly people need support and care because they become less independent and insufficient of supporting their day to day functions. Within the elderly population COVID-19 has been extremely tough on those elderly who are empty nesters, have nobody to look around and after. The study aims to understand the living experiences of empty-nest elders within the context of COVID-19 pandemic. We have used the qualitative research approach (phenomenological approach) to gain in-depth understanding of the lived experiences of empty nest elders of Kashmir during COVID-19 pandemic. We used the non-probability purposive sampling to recruit the participants. The study used interview method for data collection. Both face to face and telephonic interviews were conducted with. Data was collected using semi structured interview guide. Data saturation technique of the qualitative data was used in this research. Data was collected using semi structured interview guide in the face to face and telephonic interviews. Colaizzi's phenomenological method of content analysis was used to analyze the data. Two themes emerged from the study. The themes along with the respective sub-themes are : 1. Challenges encountered by the elderly empty nesters during COVID-19 pandemic (incomprehensible information about the virus and pandemic, multiple health issues, fear and panic, social isolation, confinement within house, limitation to access daily use products, limitation to access pension/ other monetary services, inability to switch to digital socialization platforms 2. Coping mechanisms used (engagement in daily household chores, reliance on religion, neighbourhood support, optimism)

### **T4B.4**

#### **Implications of the COVID-19 Pandemic on Future Population Growth in India**

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By 13th March, the Covid-19 outbreak had spread to 114 countries with more than 118,000 cases and 4,291 deaths, leading WHO to declare it a pandemic (WHO 2020). Apart from pre-existing barriers in health facilities, three interactive phenomena of growing prevalence, the imposition of prolonged lockdown and forced return migration –have made the situation more adverse, specifically for the availability and accessibility to the public healthcare services in India. This paper attempts to understand the plausible implications of the current pandemic on three aspects of population growth – fertility, mortality and migration – in India by using existing data on various indicators of population and health from the fourth round of National Family Health Survey (NFHS), 2015-16, and Health Management Information System (HMIS for the year 2019-20 and 2020-21) of the Government of India. It seems that the states which have not undergone demographic transition would be the worst sufferer due to COVID-19 pandemic as both – fertility as well as under-five mortality rates – would likely to increase in these states in near future. Such an increase could disrupt the pace of demographic transition in these states and would have negative implications for the larger goal of population stabilization in India by 2045. At the same time, mortality due to COVID-19 would likely to be higher in the states which already have undergone demographic transition, through its implications to the future population growth would be minimum. Lastly, a clear policy and programme are required for inter-state migratory movement so that both – the place of origin as well as the place of destination – can be benefitted in future, apart from the well-being of the migrants.

## **T4B.5**

### **Disparity in Accessing Online Education during the COVID-19 Pandemic**

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COVID-19 pandemic suddenly disrupted the usual way of teaching-learning process. The educational institutions were compelled to shift to online mode of teaching which might have created disparity in accessing higher education. Hence, this paper aims to find out the disparity in availing higher education among the post graduate students in lower Assam. Data for the present study comes from an online survey conducted among the Post Graduate students of Bodoland University during May 2020 with the help of Google Form. A total of 486 students, that is about one-third of the total students of the University, responded to the survey. Result indicates that all students possess smartphone, whereas only 48.6 percent have laptop/computer at home. Mostly SC, ST, male, first year, and younger students do not own laptop/desktop. The result of binary logistic regression suggests that second year students are more likely (OR: 1.691, 1.141 – 2.507) to own laptop/desktop. It is found that only about one-third of the students have laptop/desktop, good/moderate internet connectivity, and good/moderate power supply. This indicates that about three-fourth of the students are deprived of attending online classes conveniently. Regression analysis indicates that older and female students are more likely to have combination of these three things together. It was also observed that although some of the students have laptop, most of their laptop is not properly functional like keyboard is not working properly, no battery backup, outdated software, etc. Frequent call drops were experienced while contacting some of the students and very poor internet connectivity was evident from online interactions. Further, some of the students do not have sufficient data pack. These findings indicate that online teaching-learning, at least to some extent, debar some of the students from availing higher education. Hence, instead of complete online mode of teaching, there is a need to resort to flipped mode o

## **T4C: Nutritional Status of Children and Adolescents: Observations from CNNS**

### **T4C.1**

#### **Analysis of Data Quality of Birth-weight Reporting: Evidence from large scale surveys and HMIS statistics**

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The study aims to analyse the quality of birth weight data collected in the large-scale surveys (NFHS & CNNS) and reported in the HMIS and its implications on low birth weight (LBW) estimations. Percentage of live-births whose weight was missing is reported in 30% or less cases in recent surveys (NFHS-4: 22%, CNNS: 30%), indicating an improvement over the last decade from 66% in NFHS-3 and around 40% in HMIS. This percentage of missing data of birth weight is higher among live-births belonging to poor households, Scheduled Tribes and Scheduled Castes, irrespective of the surveys, Reporting of birth weight from the health cards has increased from NFHS 3 to NFHS 4/CNNS but still varies by socio-economic variables. In all the three surveys, heaping of birth weight at digit ending with 0 or 5 is observed. Irrespective of reporting from the cards or recall by the mother, birth weight reporting is highest at 2,500g and 3,000g. Level of missing birth weight and heaping is found higher among the children born at home in comparison to facility-based births in the three surveys. The paper demonstrates state-level variations in birth weight reporting and inconsistencies in this reporting across surveys and HMIS. There is a vast difference in the estimate of low birth weight from surveys and service statistics (HMIS). In 2015-16, the prevalence of LBW as per HMIS data is 12.5% whereas during the same time, NFHS 4 and CNNS surveys reported the LBW prevalence as 18%. This paper identified the possible biases in missing and reported data (heaping) in surveys and under-coverage and other issues in HMIS. The findings suggest that LBW is likely to be underestimated when missing data as well as heaping at 2,500g is highly prevalent. There is a need for a comprehensive method of data collection of birth weight to get an accurate prevalence of low birth weight.

### **T4C.2**

#### **Status and Correlates of Non-Communicable Diseases among Children and Adolescents in Slum and Non-Slum Areas of India's Four Metropolitan Cities**

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The emergence of non-communicable diseases in childhood poses a serious risk to a healthy adult life. The present study aimed to estimate trends in the prevalence of non-communicable diseases for urban areas disaggregated by slums and non-slums among children and adolescents, and the associated factors. Nationally representative data from the Comprehensive National Nutrition Survey (CNNS) was used for estimating the prevalence of non-communicable diseases among children. Estimates were based on children (5-9 years) and adolescents (10-19 years) from four metropolitan cities for whom biomarkers predicting diabetes, high total cholesterol, high triglycerides and hypertension were determined. Weight, height and age data were used to calculate z-scores of the body mass index. Overweight and obesity was high in urban areas among children and adolescents both in the slum and non-slum areas with very little or no slum/ non-slum disparities. Region-wise differences in the prevalence of diseases were observed; children in Delhi and Chennai had a higher likelihood of being diabetic while children in Kolkata were at a greater risk of high total cholesterol and high triglycerides. The risk of hypertension was strikingly high among non-slum children in Delhi. Overall, children from richer households had a greater likelihood of suffering from one or the other non-communicable disease irrespective of their residence in slum or non-slum areas. Increased focus on nutrition education across class groups and screening of children for early detection can help in prevention and control of non-communicable diseases in childhood.

### **T4C.3**

#### **Status and Correlates of Micronutrients Deficiencies in Slum and Non-Slum Areas of India's Four Metropolitan Cities: Investigation from CNNS**

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Micronutrient malnutrition is an emerging public health concern globally. It affects people of all ages and socioeconomic groups; however, the most marginalized are the worst affected. Using data from the Comprehensive National Nutrition Survey 2016-18, we determined the magnitude of deficiencies (of iron, zinc, vitamin A, folate, vitamins B<sub>12</sub> and D) among children and adolescents (1-19 years of age) living in four metropolitan cities of India. Separate estimates by residence in slum and non-slum areas were derived for pre-school and school-aged children and adolescents. The association between each micronutrient deficiency and socioeconomic demographic and programme variables was assessed using binary logistic regression. Of all children in the sample, at least seven out of 10 children suffered from some kind of micronutrient deficiency. Anaemia was prevalent among all children but at different levels among various age-groups. Pre-school children who had received deworming doses within 6 months prior to the survey had significantly lower risks of being anaemic. Deficiencies of iron, folate and vitamin A was higher among children in slums whereas deficiencies of vitamins B<sub>12</sub> and D and zinc were more prevalent among non-slum children. Poor dietary diversity and lack of exposure to government-sponsored nutrition programmes were related to higher zinc deficiency among slum children 5-9 years' old. Adolescents exposed to IFA supplementation programmes were less likely to be folate deficient. Overall, government schemes that have been running for decades, and intensified lately, seem to have some positive effect on micronutrient status of children. Nevertheless, differential estimates by slum/non-slum residence and by age-groups calls for a targeted approach to address micronutrient deficiencies among this children and adolescents. Nutrition education not only for slum residents but also for those from non-slum areas is an urgent need to check the spread of micronutrient deficiencies.

#### **T4C.4**

### **Anthropometric Assessment of Children and Adolescents in Slum and Non-Slum Areas of India's Four Metropolitan Cities**

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The study aims to present the anthropometric measurements and indices, both conventional and CIAF among children younger than 5 years, school-age children (5-9 years) and adolescents (10-19 years) living in four metropolitan of India – Chennai, Delhi, Kolkata and Mumbai, disaggregated by slums and non-slums through conventional anthropometric indices and CIAF. We hypothesize that the physical growth indicators and consequently the anthropometric indices, are less favourable among children who are slum-dwellers as compared to those residing in non-slum urban areas. Our study reveals that there is not much difference observed in the CIAF among slum and non-slums in both 0-4 and 5-9 age children. Though, the percentage of underweight (0-4) children is higher in slum areas and for 5-9 age children, stunting is more prevalent in non-slum areas. The sub-group analysis was also performed to understand the predictors of anthropometric failure in slum and non-slum children since slum and non-slum may have different factors affecting CIAF. Our results indicate that mother's higher education is negatively related to CIAF in non-slum areas for 0-4 year children, and for both slums and non-slum for 5-9 year children. Poor children are more likely to have higher CIAF as compared to non-poor children, in both slum and non-slums.

## **T5A: Ageing, Health and Living Arrangements**

### **T5A.1**

#### **What Predicts to Elderly in Seeking Healthcare Utilization across Public Private Institutions in India: Evidence from NSSO**

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The elderly population in India is expanding fast, which indicates a growing share of the population with more specialized needs for health and support. One of the most resultant issues is the choice of health care services among the elderly. Under Andersen's Health Behaviour Model, this study attempts to examine the predictors of the choice of inpatient health care services among the Indian elderly between private and public services. Applying Andersen's Health Behavioral Model in India's 75th round of National sample survey data, binary logistic regression analysis was used to explore the association of predisposing, enabling, and need factors with the utilization of healthcare services. Of 12642 respondents who were used inpatient care in the last 365 days preceding the survey period, 42.9 % of respondents used a public facility and 57.1 % a private facility. The result indicates that the elderly belonging to upper caste, having an education, higher incomes, noncommunicable and other diseases, needing surgery were more likely to choose private health care facilities. Further, the analysis also reveals that the choice of hospitalization varies across the region. The findings of the study contribute to the existing field of research on the choice of health care in the context of Indian in several ways. It shows that the public sector has not been a choice for inpatient care for most of the elderly population across Indian states. It establishes that apart from the financial factors, socio-demographic as well as need factors are equally important in decision making concerning health care utilization, which may help policymakers to understand better the health care needs of this segment of the community.

### **T5A.2**

#### **Does Socio-economic Inequality Exist in One-person Household among Older Adults in India? Evidence from National Family Health Survey, 2015-16**

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In the context of rapid population aging, living alone in late life is considered as a living arrangement with various disadvantages. The burgeoning literature suggests that the people who live alone in their late-life may be more vulnerable in terms of socioeconomic factors. The study aimed to assess the associations between older adults living as one-person households (OPH) and socioeconomic status. The data was used from National Family Health Survey round which was conducted in 2015-16 (N=146, 657). Descriptive along with multivariate analysis was used in the present study. For assessing socio- economic differentials concentration index along with concentration curve was used. Further decomposition analysis was used to estimate the factors contributing for socio- economic differentials among older adults. It was revealed that poor older adults had higher proportion of OPH (12.7%) than older adults from non-poor category (3.8%). The value of concentration index was -0.38 indicating concentration of OPH among poor older adults. Manipur was having the highest value of concentration index (-0.614). The highest percentage of poor OPH older adults was in Kerala (30.7%) and whereas it was lowest among Bihar (5.9%). About 33.6% of SES related inequality was explained by currently married older adults followed by older adults from rural place of residence (30.9%) and older women (29.3%). Older adults who are poor, women, never married, and living in rural areas need greater attention from both governmental and non-governmental organizations. Moreover, policies should be designed by differentiating between older adults who live alone by choice and those who are forced by circumstances to map the vulnerabilities effectively.

### **T5A.3**

#### **Association of Socioeconomic and Health-related Factors with Preference for Separate Living among Older Adults: A Cross-sectional Study in India**

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This paper attempts to understand the associated factors of preference for separate living arrangements among older adults in India. The study also explains the association of the health condition of older adults with their preference of living separately. It relies on data from Building Knowledge Base on Population Ageing in India (BKPAI). Bivariate and probit regression analyses were performed to carve out the result. The sample of the older adults for the study was 9540. Several background variables including age, sex, education, religion, and ethnicity arise as significant predictors of living arrangement preference. The availability of children is consistently found to be negatively associated with the preference for separate living. The extent to which kin availability determines living preference, however, depends on other health factors. Moreover, better self-rated health, independence in daily activities, and facing any type of violence surface as the strongest predictors of preference for separate living. Feeling of importance in the family tends to be viewed by older persons as an important factor to desire co-residential arrangements. The swing towards separate living has resulted in the family life of the older adults being highly influenced by physical proximity to kin in addition to a health condition and economic resources, which suggests attention to the demand for specialized services that allow older adults to remain in their homes for as long as possible in the face of other constraints, such as limited functional capacity

### **T5A.4**

#### **Living Arrangements & Treatment-seeking Behavior among Elderly with Locomotor Disability in India**

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As we can see India experiences Demographic Transition, older individuals living with an increasing life expectancy. These added years may be lived by them requiring more assistance or care to manage their physical activities. The study aims to explore the treatment-seeking behavior and to investigate the different types of caregiving to the elderly with locomotor disability by their living arrangements. Using National Sample Survey (NSS) 76th round data, study tried to work out a comparative picture of patterns in living arrangements and health service coverage between two states which vary in demographic conditions. The two selected states at varying stages of demographic transition – Kerala and Uttar Pradesh, Kerala has the maximum proportion of elderly persons (Census, 2011) and Uttar Pradesh has the highest number of 76th elderly with locomotor disability (NSS round). The lower rates of infant mortality, under 5 child mortality, total fertility rate and greater life expectancy at birth, aging index and the percentage of older adults confirms the advancement of Kerala in demographic aging and transitional process. Bivariate analysis, multinomial logistic regression analysis were used to assess the treatment-seeking behavior and the distribution of caregivers according to the living arrangements of the elderly with Locomotor disability. After adjusting various demographic variables, study has found that, elderly living alone with locomotor disability is least likely to utilize and spent for healthcare utilization in Uttar Pradesh (84.5%) than in Kerala (92%). Interestingly, the pattern of care provider differs in Uttar Pradesh and Kerala at great extent. The observed differences in the effects of various determinants related to health care between Uttar Pradesh and Kerala are largely the result of an apparent lag in the health transition stages of the two states.

### **T5A.5**

#### **Health Issues, Health Care Utilization and Health Care Expenditure among Elderly in India: Thematic Review of Literature**

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In order to achieve the goals pertaining to healthy ageing and as a reflection of momentum generated around the issue of population ageing in the Indian context, assessing the status of health issues is important. The study synthesises the empirical research studies and discuss the health need of the elderly population, healthcare utilization and healthcare expenditure. The review employed a systematic search for all relevant studies meeting the specified inclusion and exclusion criteria. After employing the inclusion criteria, more than 70 studies were included for the analysis and systematic review. Despite an increasing feminization of India's older population marked by a high incidence of widowhood among aged women, women's health in later life and the health consequences of widowhood has received little attention in the existing gender and gerontological studies in India. High health spending among elderly coupled with absence of insurance coverage expose the elderly, particularly those belonging to lower socio-economic strata, to great financial risk. To address the health inequities among elderly in India in an effective manner, efforts are required at the micro level wherein involvement of the family is critical to ameliorate caregiving. The expansion in insurance coverage and the provision of good-quality, subsidized, public health facilities will both improve access to health care and protect the poor elderly against financial catastrophe.

### **T5A.6**

#### **Working Women and Eldercare: A Qualitative Perspective**

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Family members, especially women, are the main providers of care and support for the elderly. With the advanced educational attainment and renewed employment opportunities, elderly caregiving has become a serious concern affecting both elderly and women caregivers due to various reasons. Hence, the paper aims to explore the elderly caregiving process, challenges and the coping strategies adopted by working women to attend to multiple roles and responsibilities. In-depth interviews with 48 respondents (22 caregivers and 26 elderly care-receivers) from 25 multi-generational households were conducted in slums of Mumbai during November 2019. Nearly 70% of caregivers were daughters-in-law, and others were taken care of by daughters. The transcripts were analyzed in QSR NVivo 10. Majority elderly had difficulty in mobility and were financially dependent on their children with no social security. Working women caregivers supported the physical needs of dependent elderly along with household work and job. Though the relationship among family members was good, the physically exhausted and stressed caregivers unknowingly resorted to elderly abuse and neglect. Elderly were confined indoors and could not attend social events, visit religious places or travel without support, which was absent. Bidirectional flow of care and support existed. Elderly especially women, contributed to household chores and took care of grandchildren. At the same time, older men relaxed during the day and were heavily dependent on female caregivers or spouses for every basic need. Grandchildren were of great support in the absence of the caregiver. Caregivers believed that caring for parents is their obligation. However, expenses on regular medication or emergency hospitalization put their family in financial distress, forcing women caregivers to work to meet ends. Elderly accepted their living and health conditions and were satisfied with the care given by their children and believed in an active lifestyle. Though, the caregiving has overstrained working women, the strong family ties, acknowledgement of the contribution of elderly during their young days, and setting precedents for their children, do not let them step back from their duties. This support has helped the elderly to reduce loneliness and have a positive state of mind. Conversations among the generations helped a lot in enhancing family ties and reducing conflicts.

## **T5B: Reproductive and Child Health**

### **T5B.1**

#### **Teenage Pregnancy in North India: A Comparative Analysis**

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Adolescent pregnancies have severe health, economic and social costs for mothers and their children. The leading causes of death among adolescent girls in the developing world are complications related to early pregnancy and childbirth. Therefore, teenage pregnancies are a matter of public health. To understand the reproductive health among the youth of the northern states of India, especially in terms of teenage pregnancy, a cross-state analysis of Bihar, Jharkhand, and Uttar Pradesh was done. These states were studied based on various factors, including family planning methods used and maternal healthcare, among others. Data was drawn from the National Family and Health Survey - 4 (2015-16). Out of 1,25,000 teenage girls (15–19 years) interviewed in the survey, about 38,000 girls from Bihar, Jharkhand and Uttar Pradesh were included in the sample. Around 3.8% of adolescent girls in Uttar Pradesh start reproduction early as compared to 12% in Bihar and Jharkhand each and 7.9% in India as a whole. Uttar Pradesh has the highest contraceptive prevalence rate (11.87%) and the lowest unmet need for family planning (21.45%). However, unlike Uttar Pradesh, a mere 1.75% of girls in Bihar and 6.94% of girls in Jharkhand use at least one method of contraception. The unmet need for family planning in these states is 29.53% and 28.39% respectively. The contraceptive use and reproductive health services have improved in all three states - Bihar, Jharkhand, and Uttar Pradesh - compared to a decade ago. However, these rates are still low enough to be considered ineffective. The central role of education and schools must be recognized in supporting adolescent health. To help adolescents fulfill their potential and lead a safe life, significant investments must be made in education, health, and development.

### **T5B.2**

#### **Examining the Effect of Household Wealth and Migration Status on Utilization of Family Planning Among Women in India, 2015-16**

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With the increasing size of India's population, although family planning has been a long-standing interest to family planner, the majority of the study has been looked up poor and migrants as a district subgroup. Another worry is, whether been poor and at the same time migrant propulsion to a double disadvantage in the utilization of family planning. Objective: This study aims to examine the pattern and factors that affect the utilization of family planning among the migrant and the poor in India. Using the data from fourth-round NFHS, 2015-16, this study grouped the variables household wealth and migration status into four district subgroups poorer migrant, non-poorer migrant, poorer non-migrant, non-poorer non-migrant. Both the chi-square test and binary logistic regression were performed to address the influence of wealth and migration status on the utilization of family planning among women aged 15-49. This study identified two district categories in terms of utilization of family planning: those who are non-poorer migrant and non-poorer non-migrants are utilized very less than the other two groups. This difference is also showing significant. The migrant, who are poorer, used traditional method 16 times higher than the non-poorer group. The reasons for the last discontinuity of 30-40% of women became pregnant, among non-poorer groups 15 to 16% women said infrequent sex or husband away. This study reiterates the inequality in terms of the utilization of family planning. Those who are poorer, as well as migrant, also deserve special attention because they are used traditional method mostly, which is more risk of getting unwanted childbirth.

### **T5B.3**

#### **A Cross-sectional Study to Assess Reproductive and Child Health Profile of Working Women Residing in Urban Slums of Gwalior City**

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In India, slum residents are unable to get safe food, drinking water, and shelter. Special vulnerable groups including women and children are at higher risk for problems related to infection and nutrition. Because working women have two responsibilities for her Family and employment, the chances of such families' reproductive and child health (RCH) being compromised are always higher. Aims: The purpose of this study is to assess the RCH profile of slum resident working women. A cross-sectional, community based Observational study was conducted among Gwalior slums. Using simple random sampling technique and informed verbal consent for the study. A total of 240 working and non-working women enrolled in this study. Semi closed, uniform questionnaire their sociodemographic, reproductive and child-health parameters were identified. The World Health Organization growth standard were used to categorize their children's nutritional status. The age of marriage and first conception have been considerably delayed among working women. Only 34 per cent of working women had sufficient birth spacing between two kids. Approximately 29.3 per cent had received sufficient antenatal care (ANC) services during pregnancy. Higher malnutrition prevalence (69.4 per cent) and lower full immunization prevalence (34.6 per cent) found among children of working women. Low birth spacing, less use of ANC care services, increased malnutrition and Poor coverage of immunization among working women had indicated underuse of RCH services by working slum women.

### **T5B.4**

#### **Criticality of Sex Education as Unintended Adolescent Pregnancies Shoots Amidst Covid-19 Crisis**

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Criticality of sex education as unintended adolescent pregnancies shoots up in Covid-19 crisis: Triple jeopardy of poverty, patriarchy, and pandemic To analyze the potential implication on reproductive health indicators of adolescent girls who've become vulnerable to unintended pregnancies resulting from the interplay of poverty, patriarchy and pandemic. Early onset of sexual activity among girl children, who are being forcefully offloaded by parents through the channels of marriage, trafficking, and sex abuse would have long term negative implications on the demographic trends in India. The paper has been developed from an intersectional perspective on poverty, patriarchy and pandemic to draw attention on the foreseeable shifts in population dynamics as a result of rising number of unintended adolescent pregnancies. The socio-economic repercussions of pandemic spiraled multiple issues including trafficking, child marriages, and sexual abuse thereby fuelling unintended pregnancies among young girls who've been suffering in silence . Moreover, financial factors added fuel to this fire with livelihood disruption; lucrative monetary offers from traffickers, lower financial expenses incurred on girl's marriage with smaller size of gathering limited to close-knit family. The research paper draws inferences from secondary review of literature from key findings from first phase of NFHS-5 factsheets to analyze a plethora of reproductive health issues among adolescent female population and also corroborates data from recent estimates in UNFPA & UNICEF and media reports. The research paper builds on this argument and analyses the potential repercussions of early marriages on demographic and adolescent reproductive health indicators by analyzing the intersection of poverty, patriarchy and pandemic.

### **T5B.5**

#### **Hysterectomy among Women in South India**

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Hysterectomy is the surgical removal of uterus. It will result in instant menopause and the women will experience all the physiological changes of menopause after undergoing a hysterectomy. She will no longer menstruate and will not be able to bear children. The objective of the present study is to understand the socio economic and demographic profile of women who had undergone hysterectomy, to identify the predictors and underlying determinants of hysterectomy and to understand the effect of hysterectomy on selected morbidities. This study used the data from NFHS-4.

Univariate and bivariate techniques is used to identify the factors responsible for the hysterectomy, Chi-square and Logistic regression is used for the analysis. The hysterectomy prevalence estimated as 4.3 percent in South India, highest in Andhra Pradesh (8.9%). More than half of women undergone the operation in private hospitals and most frequent cause is excessive bleeding. The study showed that hysterectomy among women in the age group 40-49 years, among Hindu women, among women who had less educated, among women in rural area, among ever married women and among employed women had higher rates of hysterectomy. Women in the middle section of the society had higher rate of hysterectomy. About 7 percent of women who had hysterectomy are covered by insurance. Parity was positively associated with the prevalence of hysterectomy. The prevalence of selected morbidities like BMI, hypertensive, heart disease, thyroid, diabetes, asthma and cancer is highly significant with hysterectomy. The study concludes that variation in hysterectomy rates have been associated with women's demographic characteristics such as race, education and socio-economic status, as well as their geographical location. Hysterectomies at young age had serious long term health implications for women. It is a potential public health concern affecting the health of the women and needs to be addressed.

### **T5B.6**

#### **Sterilization in India: A Comparative Analysis of Low and High Fertility State**

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One of the unprecedented factor for decline of fertility level across region is to increase access to contraception methods (Leone, T., and Padmadas, S. S., 2007). The individual rights to make appropriate choice if contraception has been brought by ICPD 1994. Even though the impact of informed and the use of appropriate contraception use is not directly measured, the studies have shown an increase in the method mix of contraception use in India over the period (Pradhan & Dwivedi, 2019). Despite change in method mix, female sterilization is still continues to dominant in the method mix (Pradhan and Dwivedi; 2019; IIPS, 2017). The dominant use of female sterilization often undermined the use of other spacing methods. In Asia women continue their reproduction till their desired family sizes and resort to permanent method (Greene and Merrick, 2005; Padmadas, Hutter and Willekens, 2004). In addition to this the stagnant rate of early marriages and child bearing behavior facilitated young age of sterilization. This paper examines the effect of parity and cohort on sterilization in high and a low fertility state of India. For this paper we used NFHS-4 data. We used survival analysis technique to analysis the effect of selected characteristics in high and low fertility states. It was found that the risk of sterilization across the parity has followed the same pattern in both high and low fertility states. Educated women are at more risk of being sterilized, with increase in wealth quantile there is a decrease in risk of sterilization in low fertility states and it was vice versa in high fertility states. Husband education has played different role, as in low fertility states there is an increased risk of sterilization with increase in husband education on contrary there is no risk of sterilization with increase in husband's education.

## **T5C: Population Characteristics and Component**

### **T5B.1**

#### **Disease Burden and Healthcare Utilization in the North Eastern Region of India**

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The Burden of diseases are changing its course throughout the globe and so does the utilisation of healthcare by the population. The paper focuses on the North-Eastern region of India its disease burden and the pattern of utilisation of healthcare facilities despite the challenging terrain and ongoing development. Based on the 75th round of National Sample Survey, Household Social consumption: Health, bivariate and multivariate analyses is used for the study. The North-Eastern region of India still faces the undeniable burden of infectious diseases (29 per 1000) followed by Non-communicable. Alongside the disease burden the healthcare utilisation of the population mostly incline towards the private healthcare over the public healthcare. The region also faces ¼ of its population not seeking any medical treatment mostly due to believing that the morbidities were not serious enough to seek treatment. In contrast to the urban population, there was a higher share of untreated morbidities among the rural population, with the majority of untreated disabilities and injuries. Government focusing on the needs as per the region is highly recommended to reduce untreated morbidities, health inequalities as well as to better the public health utilisation.

### **T5B.2**

#### **Fertility and Family Planning Differentials among Social Groups in India**

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India has almost achieved replacement level fertility but considerable fertility and family planning use differentials that exist among social groups. Therefore, we aimed to examine the fertility and family planning differentials among social groups in India. The data has been analyzed from the fourth National Family Health Survey (NFHS 4) conducted during 2015-2016 in India. The analysis of data has done by using bi-variate, logistic regression, and multiple classification analyses to observe the association between each of the dependent and independent variables. The analysis reveals that fertility and family planning differentials exist among social groups in India. The scheduled caste, scheduled tribe, and other backward class women have exhibited higher fertility and lower contraceptive use than other castes women have. Multivariate analyses on cumulative fertility and contraceptive use show that differentials exist between the social groups even after controlling for the other socioeconomic and demographic variables. The rural areas are lagging behind urban areas but the gap is narrowing at higher levels of socioeconomic status. There is a negative relationship between education and fertility. The use of the family planning method significantly increases with the age of the women, marital duration, and household wealth index.

### **T5B.3**

#### **Trend and Pattern of Internal Migration in India 1971-2011**

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Internal migration is an essential factor influencing social and economic development in developing countries. Indian census records that in 1971, the number of migrants was about 160 million. The number increased to about 225 million in 1991. In 2011, migrants nearly doubled to about 450 million persons based on the place of last residence. Migrants in 2011 constituted about 37 percent of the country's total population. The surge in migration suggests that socio-economic changes have significantly affected the population's mobility. This paper attempts to provide the trends and patterns of internal migration during 1971-2011 based on census data for that period. Focus on the migration flows indicates that the mobility of the Indian population has gradually increased over the years. There is a gradual feminization of migration in the country. Migration matrices of intercensal periods (1981-91, 1991-01, 2001-11) have been constructed to study the intensity of migration flows between states. More than one-third of the internal migrants have migrated to Maharashtra, Delhi, and Gujarat. It is seen that more than one-third of all intercensal internal migrants have originated from Bihar and Uttar Pradesh. Moreover, out-migration ratio has been computed for all states. A ratio of 1 indicates an equal number of out-migrants and in-migrants. A ratio above one indicates a larger number of out-migrants, and a value less than one indicates a larger number of in-migrants.

### **T5B.4**

#### **Factors Determining Out-migration from Bihar and Uttar Pradesh, 1981-2011: A Quasi-Poisson Regression**

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The two states of Bihar and Uttar Pradesh have dominated interstate migration in the country. The intercensal interstate migration from the two states increased from 33 percent in 1991 to 36 percent in 2001 and further to 37.5 percent in 2011. However, migration from the two states has been confined to few states in the study years. The paper analysed intercensal migration from Bihar and Uttar Pradesh to various destinations during Census 1991, 2001, and 2011. In 1991, about three-fourth of total migration from Bihar migrated to just seven states of India. The trend continued in 2001 and 2011. West Bengal was the most preferred destination for migrants from Bihar in 1991. In recent years, a higher proportion has migrated to the NCT of Delhi. A concentration of migration flows from Uttar Pradesh can be observed from the analysis, with more than 80 percent migrating to few states of India throughout the years. Maharashtra and Delhi have remained the preferred destination of migrants from Uttar Pradesh. States in South and Northeast India have remained the least preferred for migrants from the two states. To determine the impact of migrant stock, distance, State Domestic Product, and Hindi speakers on the destination choices of migrants from the two states, a Quasi-Poisson regression has been run. The positive effect is highest in the case of migrant stock for the migrants from Bihar, indicating that states with larger migrant stock attract further migrants. Net state domestic product, a proxy for the economic performance of a state, has the highest positive impact on the choice of destination among migrants from Uttar Pradesh. While geodesic distance has a negative impact, the number of Hindi speaking populations has no significant impact on destination choice in both states.

## **T5B.5**

### **Living Conditions and Quality of Life of Transgender in Kurnool district, Andhra Pradesh**

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Life of a transgender is difficult because their sexual orientation is unacceptable in most places around the world. Having a dignified living is still unimaginable for many transgender. They experience discrimination and harassment at each stage of their life. There is an urgent need to highlight the physical and psychosocial problems faced by transgender. This study aims to investigate the living condition and quality of life of transgender living in Kurnool district, Andhra Pradesh. We used qualitative techniques such as in-depth interview and key informant interview for collecting information on the living condition and quality of life. A primary survey was done in Kurnool district of Andhra Pradesh. We interviewed 110 trans genders for this study. We assessed the quality of life in terms of physical, psychological and social well-being. We found trans gender people faced discrimination at every aspect of their life. Many participants reported that they were abused by the society members. Also, they lack access to quality health care and no specific public health cover was provided for trans gender. Besides, we found transgender people live in a separate community and survive on begging and dancing. We found 56 % of total participants experienced poor physical quality of life. About 66% and 39% of total participants reported poor psychological health and unhappy relationship with society members respectively. We suggest special health insurance coverage for transgender. Allocation of appropriate fund for supporting the livelihood of transgender may improve their economic situation. Awareness campaign to ameliorate the acceptance of transgender in the society is strongly encouraged.

## **T6A: Non-Communicable Diseases**

### **T6A.1**

#### **Does Changing life-style and Other Health-related Issues has any Effect on the Non-communicable Diseases among Men and Women in India?**

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Non-communicable diseases (NCDs)—mainly cardiovascular diseases, cancers, chronic respiratory diseases and diabetes—are the world’s biggest killers. More than 36 million people die annually from NCDs (63% of global deaths), including more than 14 million people who die too young between the ages of 30 and 70 (WHO, 2013). Low- and middle-income countries already bear 86% of the burden of these premature deaths, resulting in cumulative economic losses of US\$7 trillion over the next 15 years and millions of people trapped in poverty ( Vellakkal S. et al., 2013).

To examine the prevalence and risk factors of diabetes, asthma and heart diseases among men and women in India. To examine the association of Non-Communicable diseases (diabetes, asthma and heart- diseases) with the socio-economic and demographic factors, life-style factors and other health related issues among men and women in India. To fulfill the objectives of the study following statistical tools has been applied 1.Bivariate analysis has been used to know the prevalence of diabetes, asthma and heart diseases, and associated risk factors of these diseases. 2.Binary logistic regression has been used to understand the association of diabetes, asthma and heart diseases with socio-economic and demographic factors, life style factor and other health related issues. This study gives interesting finding that non-communicable diseases (diabetes, asthma and heart-disease) are affected by many factors like socio-economic factors, life-style factors and factors related other health-issues. One of my major finding is that the prevalence of all three non- communicable diseases.

### **T6A.2**

#### **Measuring and Decomposing Inequalities in Mental Disorders among Elderly in Five Low- and Middle-Income Countries: Evidence from WHO-SAGE, wave 1**

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The present research aims to quantify the extent of inequalities in context of mental disorders among the older population in India, China, Ghana, Russia, and South Africa. Though, several studies show prevalence of mental disorder among these countries, little is known about relative contributions of explanatory factors for health-related inequality in mental disorders among elderly. Data from Global Ageing and Adult Health (SAGE), WAVE-1 (2007-10), has been used for analysis. Finding portrays that though inequality prevails more in China, Indian older population is suffering more from mental disorders compared to other selected countries. Further, decomposition analysis reveals that age, urban residence, male, and education (high school or more) show significantly more importance in order to explain relative contribution in inequality for mental disorders. In contrast, relative contribution of employment is very less. The lower value of unexplained CI shows that selected explanatory factors are more significantly explained the existing inequalities in these countries. In essence, results indicate that inequalities are artefact of existing inequalities through place of residence, gender, education, and economic factors, which need instant attention of policy makers to promote mental well-being through active and healthy ageing in these countries.

### **T6A.3**

## **Health Belief Model based Community Education Interventions on Breast Cancer Awareness and Practices among Women: A study in Low Socio-economic Area of Mumbai**

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The present study aimed to improve breast cancer (BC) awareness and practices using health educational sessions for women and primary healthcare providers in low socio-economic community of Mumbai. The baseline and endline survey was conducted using structured interview schedules and 410 selected women aged between 18-55 years. ANNOVA and paired t-test were used to check the level of significance of net mean score of BC knowledge. Our results showed significant in difference in mean knowledge score for both signs & symptoms (Mean Difference (M.D.): 4.09, Standard Deviation (S.D.): 4.05,  $P < 0.00$ ) and risk factors of breast cancer knowledge (M.D.: 5.64, S. D.: 4.00,  $P < 0.00$ ) among women after intervention. There was a marked improvement in the knowledge of BC among women with low education category. The breast self-examination practices improved from 3 % to 65% and 41% more women went for clinical breast-examination after intervention.

### **T6A.4**

#### **Mapping the Hotspots of Lifestyle Diseases Using Geospatial Techniques, A Case Study of Kerala**

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Next to basic needs like food, shelter and clothing, healthiness and wellbeing is the major concern of today's world. . In the wake of emerging population and advanced technologies which aim to reduce people's effort, there is more chance for the occurrence serious communicable, infectious and lifestyle diseases. Diabetes, hypertension, certain forms of cancer, heart diseases and diseases associated with tobacco and alcohol consumption are directly linked with lifestyle choices. Kerala, a tropical monsoon state is vulnerable to be affected by various infectious diseases during monsoon period. Although Kerala state has been given credits in exhibiting high literacy rate and relatively better standard of living, the recent survey reports published National Family Health Survey reports shows the state stands among one of the many states with increased risk of occurrence of lifestyle diseases. Spatial statistical analysis in Geoinformatics like Hot Spot analysis reveals the spatial characteristics of the data sets. The present study is carried out by using the secondary data published by National Family Health Survey (NFHS) during 2019-2020. The key findings on Kerala shows that high Blood Sugar among women are slightly decreased from 8.7% to 8.3% in NFHS-5, 2019-20 when comparing to NFHS-4, 2015-16. Tobacco use, unhealthy diet, insufficient physical activity and harmful use of alcohol are the major causes of lifestyle diseases found in Kerala. The spatial analysis of the data reveals the fact that people residing in the southern districts of Kerala are more vulnerable for lifestyle diseases. The reason can be attributed to the urbanization and change in lifestyle pattern found in southern districts compared to northern districts of Kerala. This kind of study will be helpful for the health authority to be alert and take necessary actions like creating awareness among public, also to enhance the health care facilities.

## T6A.5

### **Anthropometric Risk Factors of Non-Communicable Diseases among the Elderly Population of India: Evidence from LASI Wave-1**

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Several studies provide evidence on the strong association of chronic diseases among older adults and physical body indices, but very few studies can be found at the India level. This study aims to clarify how various non-communicable morbidities are associated with body mass composition measured indices: body mass index (BMI) or obesity, and waist-to-hip ratio (WHR). The study uses data from the recent first wave of the Longitudinal Ageing Survey in India (2017-18). The total sample size is 72,250, of which the study has restricted the sample to 59100, only including those aged 45 years and above. The self-reported non-communicable diseases included are among the top ten causes of death, such as cancer, hypertension, stroke, chronic heart diseases, CVDs, and chronic respiratory diseases. For Obesity and WHR, we have used standard criteria given by the WHO. This study analyzed association and risk by using the chi-square test and multivariate Logistic regression, respectively. The study has also included demographic and socio-economic factors that help adjust the model and better the results. This study has revealed, physical body indices of overweight or obesity and Waist-to-hip ratio are highly significant with cancer, diabetes, CVDs, and chronic respiratory diseases among older adults. Based on the multivariate-adjusted model, odds shows the person has almost 100% (AOR: 1.99; 95% CI (1.994, 1.997)) by obesity and 63% (AOR: 1.63; 95% CI(1.629, 1.631)) by WHR more likelihood of developing CVDs among elderly than the normal older person in India. Similarly, Obesity and a high waist-hip ratio are significant and substantial risk factors for developing other NCDs among the elderly. This study has concluded that physical body indices are essential to reduce NCDs' risk among the elderly. Our duty to aware of elderly adults to do exercise and physical activities.

## **T6B: Health and Nutrition**

### **T6B.1**

#### **Effect of Maternal Height on the Risk of Caesarean Section in Singleton Birth: Evidence from the Large-Scale Survey in India**

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Short adult height, which is a sign of growth retardation, is a particular indication of childhood undernutrition in low and middle-income countries. Short stature women of narrow pelvis area are related to obstructed labour, through which the head or shoulder of the baby is hindered. However, wider pelvis among the tall women, allow them to have easier childbirths and higher birth weight babies, both factors which reduce infant and maternal mortality. The objective of this study is to examine the association of maternal height in relation to the risk of caesarean section (CS) delivery. The study is cross-sectional which is based on secondary data from the Indian Demographic Health Survey conducted during the year 2015-16. In our analysis, we include only singleton birth (i.e. exclude multiple births). After excluding women with height less than 120 cm and above 180 cm the final sample is 2,51, 768 women who could be included in the analysis. We adopted logistic regression to estimate the odds ratio of the association between the risk of caesarean section delivery and maternal height. The results reveal that the odd of undergoing CS delivery significantly decreases with increased maternal height. Mother with height 120-137 cm [OR: 4.86; CI: 4.08-5.78] were almost five times more likely, and mother with height 164-165 cm were 28% less likely [OR: 0.72; CI: 0.64-0.83] to undergo CS delivery as compared to mother with height 150-151 cm. Mother with childbirth weight 4500 grams or more were 79% [OR: 1.79; CI: 1.60-1.99] more likely to undergo CS delivery as compared to mother whose childbirth weight is less than 4500 grams. The findings suggest that counselling to taller stature pregnant women should be more emphasized as a positive sign for successful vaginal delivery, and indirectly may lower the CS rate.

### **T6B.2**

#### **Age-Wise Growth Pattern of Stunted Indian Children and their Correlates: Evidence from NFHS-4 (2015-16)**

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"Age-wise Growth Pattern of Indian Children and their Correlates: Evidence from NFHS-4" Globally 144 million i.e., 21.3% of under 5 children are Stunted, 47 million are Wasted and 38 million are Overweight. This Paper has 3 objectives. First, to compare the height of the Indian Children with the WHO Standard and the second, to study the Birth Weight of Stunted and Non-Stunted Children. Third, to analyse the growth pattern, distribution and factors of stunted children by age across India Data from WHO MCGRS and NFHS 4 were taken. Binary logistic regression undertaken to determine which background characteristics have a statistically net association with the prevalence of stunting and severe stunting. Adjusted odds ratios from a logistic model are presented with 95% confidence intervals. The dependent variable 'stunting' assumes a value of 1 if the study population is stunted, and 0 for not stunted. Likewise, for dependent variable 'severe stunting' a value of 1 is taken if the study population is severely stunted, and 0 for not severely stunted. With limited data and time for analysis, the study however could explore certain fundamental issues related to child growth, and highlights risk factors of stunting, based on selected household wealth quintile, mother's education, child's weight at birth, mothers' height and child anaemia. In addition to the policies and programmes aimed at improving maternal and child nutrition, equal focus should be given to improving mothers' education. Findings also suggest that Indian children grow like any other child in developed countries, but as age increases growth become a casualty due mainly to poverty and lack of access to healthy and nutritious diets. Also, it is important to address income inequality when implementing nutritional interventions.

### **T6B.3**

#### **Association between Gender Inequality and Maternal, Neonatal and Child Health: A Pooled Analysis of data from 160 Countries**

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Gender inequality has significant influence on the maternal and child health as it can influence the support for women during and after pregnancy. However, the relationship between gender inequality and various maternal and child health indicators still remains unclear. To assess the association between gender inequality index (GII) and various maternal, neonatal and child health indicators throughout the world. We adopted an ecological design and obtained the GII data from United Nations Development Programme data repository for 160 countries. Data on outcome indicators was obtained from World Bank, Global Health Observatory and United Nations Children's Fund data repository. To study the association between GII and outcome indicators, robust regression and instrument variable regression was performed. In total, data from 160 countries were included in the final analysis. Women in Africa and low HDI regions faced maximum gender inequality when compared to other regions. GII had significant correlation with all the outcome indicators ( $p < 0.001$ ). Maximum correlation was seen with mortality indicators such as NMR, IMR, U5MR, female IMR and female U5MR (Spearman's  $\rho > 0.90$ ). We found that higher the gender inequalities index in a country, higher the mortality and morbidity rate and lesser the service utilization or coverage of mothers and children ( $p < 0.001$ ). These associations persisted even after adjusting for GDP per capita of countries. Our study shows that gender inequality has negative impact on morbidity, mortality and service utilization of women and children. Hence, national policies and legislations targeting the women's health, education, employment and political empowerment should be implemented.

### **T6B.4**

#### **Effect of Maternal Nutrition and Socio-Economic Factors on Child Nutrition in India**

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Malnutrition is a social and economic problem, holding back development across the world with unacceptable human consequences. In India the number of children under the age of five dying due to malnutrition has dropped by two-thirds from 1990 to 2018. Despite the huge drop in malnutrition deaths, it continues to be an underlying risk factor for 68 per cent of the deaths among children under the age of five in India. India has the world's worst level of child malnutrition. The influence of maternal nutrition on the health and the survival of children are exceptionally high during the first five years of life. In India, one in two women and one in five women who enter pregnancy are anemic or undernourished, respectively. The objective of the present study is to find the effect of maternal nutrition and socio – economic characteristics on child nutrition in India. Data from NFHS – 4 was used in the study. Univariate and bivariate distribution tables are used to analyse maternal nutrition and socio – economic characteristics and nutritional status of children. Chi-square and Logistic regression analysis were also done for the detailed and in-depth study. The study identifies the effects of maternal nutritional status on the child growth failure (CGF) in India. In case of severely and moderately underweighted children in India, the highest proportions of severely and moderately underweighted children were among severely stunted mothers (61 and 49 percent respectively). More than 60 percent of the total children born to mothers with normal weight for height were severely or moderately underweighted. India is home to one – third of world's total stunted children. The state of malnutrition in the country is alarming and disturbing.

## **T6B.5**

### **Age-appropriate Immunization Scenario of Children in Jharkhand**

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Children's health status is crucial as it affects every phase of life, not only for the child but also for the family and the nation. As per WHO, immunization is a proven method to avert life-threatening infectious diseases and is expected to prevent 2 to 3 million casualties per year. This study focuses on the state of Jharkhand, India. It was created as a new state out of Bihar in 2000. With a population of 32 million as per census 2011, of which approx. 26 percent is considered to be tribal population. In 1998-99 only 8 percent of the children aged 12-23 months were fully immunized, which rose to 61.9 percent in 2014-15, but age-appropriate immunization remains starkly low at 29.6 percent. Age-appropriate immunization implies that children receive all vaccines within recommended age intervals and on time. Maximum immunity is not attained if vaccination is too early or delayed. Child immunization status is determined by several factors at the individual, family, community level, and health system or service delivery level issues. This study uses unit-level data from the 4th round of NFHS; bivariate and multivariate analyses were carried out to examine the objectives of the study. The state of health care was low at the time of the formation of Jharkhand, but significant improvements have been made in improving the full immunization coverage. The gap between present status and the final goal of universal access to safe, essential and quality vaccines can only be achieved by targeting those left behind, who do not have accessibility to the nearest health center and socially disadvantaged groups. Spreading awareness and information about the advantages of immunization of their child through health care networks and mass media campaigns can positively impact universal immunization and reducing the burden of infectious diseases in Jharkhand.

## **T6B.6**

### **Understanding the Impact of COVID -19 on Adolescents (10-18 years) in India**

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Adolescents are the backbone of any society, as the future of the nation depends on them. The evolution of COVID -19 as a pandemic has disrupted the lives and daily routine of the adolescents also. The objective was to understand the overall impact of COVID-19 on adolescents. Literature searches were conducted in various databases: MEDLINE, Scopus, PubMed, ERIC, WHO Global Health research database on COVID-19. They were refined in accordance with the inclusion criteria using filters to limit results to articles written in English, to peer-reviewed empirical research, to studies related to adolescents(10-18 years)in India, and being COVID-19 specific. Results showed increased school drop outs; stress and other mental health disorders; increase internet use and smartphone dependency or addiction; initiation of smoking, alcohol, or drugs at early age;interruption of learning opportunities for growth and development. Parents were unprepared for distance and homeschooling, particularly those in lower socioeconomic status and illiterate parents. Further,adolescents had to face poor menstrual hygiene;early and forced marriages;early pregnancy;nutritional problems (irregular supply of weekly IFA Supplementation [WIFS] and mid day meal scheme/ program).There was also increase in exposure to violence,exploitation (including sexual), abuse/maltreatment, and neglect. Therefore, with restrictions in learning, socializing, and physical activity due to COVID-19, the substantial risks to the most vulnerable adolescents will be on the rise. Break in basic health services, resulting in health deterioration and behavioral changes will not only affect present health but will also have an impact on their adulthood. This may soon evolve as major public health challenge among adolescents. Public health officials must prioritize the adolescent needs and demands and implement national plans/ policies accordingly in the future for coping-up with the problem.

## **T6C: Gender Issues during Pandemic**

### **T6C.1**

#### **The Gender Question of Pandemic: Work, Leisure and Mental Health Status of Employed Women in Kerala**

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From the wake of modernity itself, the exploitative position of women in society has been questioned by many academicians. The unaccounted labor carried out by women in domestic settings was always deemed a critical subject. Even if numerous such movements were fronting this unequal work division between men and women in the family, recent studies had shown that women are still doing the majority of household chores. Against the backdrop of this standpoint, a study has been carried out during Novel-Corona virus spread and subsequent lockdown. The study has focused on the working women, who indulged in work from home due to the lockdown protocols in several organizations. The target population parameter were salaried working women in the organized sector, those who had carried out work from home during the lockdown. The purpose of addressing the diversity like jobs had been met by including participants from the IT sector, education sector, and other service industry jobs. Due to the lack of a sampling frame with all the desired population parameters, 200 samples were drawn with a snowball sampling technique, and respondents were interviewed with a structured questionnaire and a standard tool DASS 21 to analyze the depression, anxiety, and stress. The specific objectives of the study were to investigate whether the consolidated working time (job-related work and domestic work) of women had increased during the lockdown, the major challenges faced by women during work from home in the time of the pandemic, and depression, anxiety, and stress experienced by women due to the decreased leisure time. The study unveiled that during work from home hours, women were also made involved in the house chore activities such as cooking, cleaning, and caring for children.

### **T6C.2**

#### **COVID-19 Pandemic and Changing Mental Health of Women: A Case Study of Bandel Area, Hooghly District, West Bengal**

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World Health Organization defined mental health as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community”. Mental health can change over time and space. Mental health conditions have a significant role in the cognitive, emotional, and behavioral well-being of a person. It is very common among the socially constructed categories of people (gender). During this year, the COVID-19 pandemic brings a change in every aspect. The changing mental health among adult females found very critical to the analysis. In this study, I have a focus on the changing mental health of middle-class women due to the notified issues stated above and their struggle to overcome them. Bandel ward (a ward no. 4) under Hooghly-Chinsurah municipality of Hooghly district, West Bengal has been selected as a unit of the case study. Data collection has been done by the simple convenience sampling method. Surveying on 386 households, 1056 sample has been collected in two phases using a structured questionnaire blended with some open-ended question. Secondary data has been collected from the district statistical handbook and district profile. After manipulation and detailed analysis of the collected data, the effect of the pandemic on the changing mental status of the women has been understood clearly. A number of cases of domestic violence, suicide, murder, sexual violence, social exclusion, unhealthy lifestyle, stressful working condition, gender discrimination, etc. have been. Changing socioeconomic status and health issues are the major causes of this type of situation. But most of the women become able to stand strong and overcome the situation as well.

### **T6C.3**

#### **Story of Two Viruses Within and Beyond Pandemic**

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The covid-19 effects and the different phases of pandemic lockdowns measures hit India's general and particular in its informal labour market economy. Millions of people have been forced out from the work and other activities, as a result of an exceptionally stark drop in economic activity and conditional job losses. The impact of employment losses has been ten times bigger than the global financial crisis in 2007-08 and this worst condition not seen since the great depression of the 1930s. The results of curfew and shutdown of economic activities leads to decline the number of hours work was gone to negative 15 per cent in first two months of the crisis. As of January 24, 2021 more than 100 million people have been infected with the virus, more than two million people lost their life, and trillions of money has been pumped into the work economy, because the pandemic pushed 40-60 million people into extreme poverty and economies forced to protect people's lives and livelihoods. In the face of this challenges a massive measures has taken around the globe and in India. The impact of Covid-19 and lockdown on human and economic progress of a country and question and challenged the many years progress on reducing poverty and inequality. At the same time the lockdown measures accelerated the digital revolution on human interaction, e-commerce, online education, remote work, generated digital gap and inequality within the society. Against this background the paper examined the covid-19 and India. The paper also discussed the effects on various aspects, particularly the informal employment, wage and income, working hours and consumption losses, based on the evidence from the CMIE, ILO and other secondary data sources. The overall results of Covid-19 and lockdown provides a new experience and collective endeavour to tackle the present situation.

### **T6C.4**

#### **Impact of Covid-19 Pandemic on Women Work Participation in India**

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UN women estimated 7.4 crore women in the informal economy, globally, whose incomes fell by 60% in the first month of the Covid-19 pandemic in 2019-2020. The negative economic impact of the pandemic is expected to have pushed 9.6 crore more people into extreme poverty (World Bank October 2020) of whom 4.7 crore are women and girls. Women's share in new payroll additions fell below significantly due to covid-19. According to Government of India data part of a gradual decline in female participation in formal work over the past few months post unlock 1.0, 2.0 and 3.0 in India. Women in the formal and informal sector faced difficulties ranging from pay cuts to job losses. The crisis was compounded by an increased burden of unpaid domestic work, revealing broader fault-lines. To study how the current pandemic and business loss have impacted women in India. International Labour Organization (ILO), UN Women, Employee provident fund organization (EPFO) and Human resource jobsites data warns that the pandemic will widen labour market inequalities, and countries may lose some gains made in previous years on women's work participation rate. Secondary data analysis has been done using R Studio. Situation analysis and descriptive statistics has been used to analyse key finding pre and post lockdown impact of women work participation rate in India. According to payroll data collected from the Employees' Provident Fund Organisation (EPFO), 669,914 people joined the formal workforce in August, and only 133,872 of them, or just 19.98%, were females—down marginally from 20.49% in July and 21.11% in June. The EPFO latest monthly data showed a sharp decline from 2019-20 when women's participation in formal work was almost 23%. Industry experts and economists, include a general dearth of jobs; discrimination against women in a patriarchal society, the lack of a family support system for urban women.

## **T6C.5**

### **Impact of the Covid 19 Pandemic: A Study on Divorced Mothers and Mothers Undergoing Divorce in Kottayam District, Kerala**

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Divorced single mothers are a population that are facing lot of problems and challenges to deal with the development of their children. During the Covid-19 pandemic situation, this population had faced lots of challenges in terms of economic and social impact. People's experiences with divorce will vary depending upon the specific circumstances before and after the divorce, the degree of divorce effect on their life, amount of conflict and crises, range of fights and effect of divorce. In this study, researcher is trying to understand the challenges faced by the divorced mothers and mothers currently going through divorce process during the COVID-19 pandemic situation. The researchers had followed sequential explanatory mixed method research design in this study. The quantitative data was collected at first and analyzed followed by that relevant qualitative perspectives were also explained in this study. The location of this study is in Kottayam district, Kerala. The Kottayam district consists of both rural and urban population. The sample size of this study is 30 divorce mothers and 30 mothers currently going through the divorce process in COVID-19 pandemic situation from the Kottayam district. The result of this study explains that, the rural participants' economic stability is a major issue due to lack of education and education is reflecting as a major challenge in pandemic crises. The urban participants' education and living arrangements are exercising as key support system to deal with the physical challenges of divorced mothers in pandemic crises. When we discuss the key supports received by the divorced mothers in COVID-19 pandemic, it is visible that in each case the strength and weakness of divorced mothers are associated with the education, employment, social support, and involvement of family members, friends and other personalities in the divorce process and after divorce.

## **T6C.6**

### **Experiencing Covid 19: A Case Study of Gender Divide among Informal Sector Employment in Idukki District, Kerala**

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The impact of a pandemic like COVID-19 has to be measured not only by its morbidity and mortality rate but also by its social, economic and political impacts. A disaster causes maximum impacts on the most vulnerable section of a society. Informal sector employees were the most affected when the whole world confined to their homes during the lockdown. In India, three quarters of employed are in informal sector and women constitutes a majority of them. Though Kerala state in general shows a low work participation, Idukki district is an exception to this, owing to less migration. But, most of these workers are in informal sector, the most affected sector during lockdown. This study tries to ascertain the issues among workers in informal sector through a primary survey conducted among the informal workers in Idukki district. The study found that the impacts are more gendered in nature. i.e, the women workers tend to be economically as well as mentally affected rather than their male counterparts. Loss of employment along with increased burden of housework and caring responsibilities during lockdown had financial as well as psychological impacts on the women folk.