



E-CONFERENCE

on
**Environmental Determinants of
Infectious Diseases in India
(Focus COVID-19)**

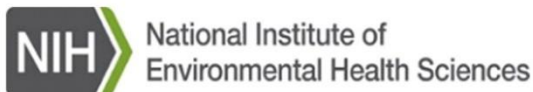
BOOK OF ABSTRACTS

7th to 10th December 2020

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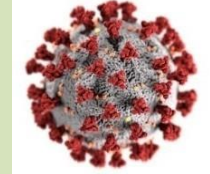
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Technical Session -1

Expert Session on Climatological Determinants of Infectious Diseases

Dr. Benjamin Zaitchik

Associate Professor
John Hopkins University,
Department of Earth and Planetary Sciences,
Baltimore, MD,
United States



PROFILE

Dr. Zaitchik is an Earth scientist who studies hydroclimatic variability across a range of spatial and temporal scales. This includes work on fundamental atmospheric and hydrological processes as well as application to problems of water resources, agriculture, and human health. Relevant to today's presentation, Dr. Zaitchik leads multiple projects that apply Earth Observation to study and predict infectious diseases, including work on malaria, cholera, enteric pathogens, and, most recently, COVID-19. Prior to joining Johns Hopkins University, Dr. Zaitchik was a Research Associate at NASA and a Fellow at the U.S. Department of State. He holds a PhD in Geology & Geophysics from Yale University, an MS in Soil Sciences from Cornell University, and an AB in Biology from Harvard College. He is currently the President-Elect of the Geo-Health Section of the American Geophysical Union.

Dr. Sagnik Dey

Associate Professor,
Indian Institute of Technology Delhi (IITD),
New Delhi,
India



PROFILE

Dr. Dey received his M.Sc. degree in Applied Geosciences from Jadavpur University, Kolkata, in 2000 and his M. Tech. degree from IIT Kanpur in 2002. Subsequently, he joined the Ph.D. program in the same institute and submitted his doctoral thesis on 'Aerosol Radiative Effects over Kanpur region in the Indo-Gangetic Basin, Northern India' in July 2007. Dr. Dey worked for three years (August 2007 to July 2010) as Post-doctoral Scientist at the Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, USA. He joined the Centre for Atmospheric Sciences, IIT Delhi, as Assistant Professor in July 2010. His research interests are to understand and quantify aerosol-cloud interaction and their impacts on climate change, and health impacts of aerosols using remote sensing and in-situ observations and models. He has published more than 50 research papers with an h-index of 19 (source: SCOPUS). He received the INSA Young Scientist Medal for 2008 and NASI-SCOPUS Young Scientist Award in Earth Sciences in January 2012. He is also the recipient of the Dr. Sudhansu Kumar Banerji MoES outstanding young faculty fellowship for the period 2011-2013.

ABSTRACT

Infectious disease transmission is modulated by changes in meteorological variables; however, the magnitude of such influence is not well known, particularly in India. Studies have shown that temperature and humidity play important role by altering the transmission window of vector-borne diseases. For diseases due to airborne virus (e.g. SARS, COVID), no conclusive evidence is obtained so far. While several studies demonstrated that COVID cases are highly influenced by temperature change, many studies found otherwise. Air pollution is another key factor that potentially can influence the spread of COVID. Additionally, people exposed to high level of air pollution are more susceptible to COVID. In the present work, we examined if short-term spike in fine particulate matter (PM_{2.5}) in India exacerbate the COVID cases. Using a generalized additive model, we found that 10 ug/m³ rise in ambient PM_{2.5} exposure (during Mar 14-Jun 9, 2020) is significantly associated with daily COVID cases in India with a lag of 0-14 days. The significant association holds for several sensitivity tests. In a placebo test where we used 2019 PM_{2.5} data, we found no significant relation with daily COVID cases. We conclude that more research is required to further understand the biological mechanism of such interaction.

Dr. Nitish Dogra

Associate Professor,
International Institute of Health Management Research (IIHMR),
New Delhi,
India.



PROFILE

Dr. Nitish Dogra, Member Secretary UCHAI Advisory committee and convener. He is a physician, physiologist and public health specialist by training with a Master of Public Health (MPH) degree from the Johns Hopkins University, United States. Based out of New Delhi, he has over a decade's experience related to environmental health with a strong focus on studying the health impacts of climate change. He was awarded the Fulbright-Nehru Environmental Leadership Program Fellowship by the US State Department and the Government of India for work related to climate change attributable burden of disease in India. Dr. Dogra has worked extensively with the World Health Organization (WHO). In August, 2014 he delivered, on request, an invited commentary at the Conference on Health and Climate organized by WHO Headquarters, Geneva; the first such global-level ministerial meet in this area.

ABSTRACT

A number of Northern India and North-East States districts fall in the mountainous region category. In addition a number of other states such as Haryana, Uttar Pradesh, Bihar and central Indian states of Chhattisgarh as well as Madhya Pradesh are increasingly showing greater frequency of cold waves. This is relevant because extreme weather is linked the climate change phenomenon. A number of different diseases are linked to cold weather including respiratory, gastrointestinal, dermatological and the like. There are various proven biological mechanisms for these linkages. A body of literature by Indian scientists exists for these studies such as for rotavirus as a winter diarrhoea and studies in extreme cold conditions. Studies are revealing the association between cold conditions and infectious diseases including COVID-19.

Dr. D.R. Pattanaik

Scientist F,
Head, NWP Division,
Indian Meteorological Department (IMD),
New Delhi,
India



PROFILE

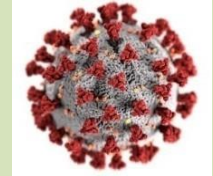
Dr. Pattanaik has worked in the areas of climate variability and climate prediction for 22 years. He currently works as Head of the Numerical Weather Prediction Division of IMD, New Delhi, specializing in extended range forecasting. He has contributed a chapter on Indian climatology in the context of human health in a book published by TERI in 2012 titled 'Climate Change and Disease Dynamics in India'. He is also the author of the publication 'Heat Index Outlook' over the Indian region with its potential application to the health sector. He has published more than 70 research papers in reputed national and international journals.

ABSTRACT

Developing a Climate Driven Early Warning System for Infectious Diseases

Climate change is likely increase the frequency of extreme weathers like increasing frequency of heat wave, heavy rainfall frequency, increase of intense rainstorms severe cyclonic storms, severe thunderstorms, lack of fresh water availability etc. The impact of climate change on health sector will be more in developing countries like India. It has been found from some previous studies that there are various complex ways in which climatic factors (e.g. temperature, precipitation, humidity, extreme weather events and sea-level rise) can directly or indirectly affect the incidence of vector borne diseases like malaria, diarrhoea and dengue etc. In countries like India large number of child deaths can be attributed to two preventable infectious diseases among others, namely malaria and diarrhoea. The number of death due to heat wave, lightning, and vector borne diseases are gradually increasing. To minimize the risk on heal sector there is a need to Develop A Climate Driven Early Warning System for Infectious Diseases based on the model forecast in the extended range time scale. IMD has started giving climate information outlook for Health, viz., temporal evolution of spatial distribution of transmission window for Vector borne disease, based on operational model run at New Delhi (Global Forecast System and Climate Forecast System coupled model) for 4 weeks. In addition, probabilistic outlook about prevalence of climatic suitability for Vector Borne Diseases (VBD) occurrence has also been incorporated in the bulletin for the week 2. Operational extended range forecast is useful in providing real time guidance of Heat Wave/Cold Wave, and other extreme weathers useful in health sectors. There is a collaborative work is going with IMD and IITM scientists to further improve the early warning System for Infectious Diseases based on the pilot project study carried out jointly (Sahai et al., 2020) over the two districts of State of Maharashtra, which showed that Increased probability of dry spell (wet spell), increased probability of low minimum temperature

(high minimum temperature) and increased probability of moderate maximum temperature (low maximum temperature) are less (more) conducive for outbreak of Malaria and ADD.



Technical Session -2

Expert Session on Impact of Air Pollution on Respiratory Infections

Dr. Pawan Kumar Taneja

Senior Faculty,
Indian Institute of Public Administration (IIPA),
New Delhi,
India



PROFILE

Dr. Pawan Kumar Taneja, is a policy analyst specialized in Management and public health system research working as Sr. Faculty (Finance & Operations Research) at Indian Institute of Public Administration, New Delhi, a premier training and policy research think tank under Department of Personnel and Training of Government of India. He holds Ph. D. in Financing & Operations Research, MBA in Finance & Operations, M. Com in Finance & Quantitative Methods, and PGD Stat in Statistics and Data Analytics. He has also done Diploma Course on Leadership Development from MEASURE Evaluation, MSH (Management Science for Health) funded by USAID and Certificate Course in Global Health from Johns Hopkins Bloomberg School of Public Health. He has more than 18 years of rich varied experience in teaching, research and industry. He has coordinated more than 25 operational research projects in the areas of management of Public Sector Enterprises, healthcare financing, climate change and healthcare, Skill Development and Disaster Management supported by UNICEF, WHO, HLFPT, Plan International and Government of India etc. At IIPA, Dr. Taneja is also responsible building leadership training and capacity building of National and International Civil Servants and public sector enterprises managers. Previously, Dr. Taneja has worked with Indian Institute of Health Management Research, IIMT, Punjab College of Technical Education and visting faculty at Fore school of Management, ISTM etc.

ABSTRACT

The relationship between air pollution and COVID-19 is not yet firmly established. Preliminary findings from the US, Italy and other places indicates a possible positive association between Air Pollution and COVID-19 Transmission as well as Mortality. A similar exercise was carried out for Smart Cities in India. These are cities in India where there is a focus on transformation in four pillars of comprehensive development-institutional, physical, social and economic infrastructure. The study was a ecological investigation between Air Pollution (as measured by PM 2.5) and COVID-19 Transmission (as indicated by COVID Cases/Tests) and COVID-19 Mortality (adjusted by population). Adjustment was made for several factors including socio-demographic, epidemiological and health system. Results showed a negative correlation. An urgent need for further studies is needed especially since certain studies for cigarette smoking are also showing a negative effect.

Dr. Shyam S. Biswal

Professor,
Johns Hopkins University,
Baltimore, Maryland
United States



PROFILE

Dr. Biswal, is a professor of environmental health sciences at the Johns Hopkins Bloomberg School of Public Health. He holds joint appointments in medicine and in oncology at the Johns Hopkins School of Medicine. Dr. Biswal received his M.S. from Nagpur University. He earned his Ph. D from the Indian Institute of Technology. He is co-director of the environmental health sciences Ph.D. track in toxicology, physiology and molecular mechanisms. The Biswal lab studies the mechanisms of susceptibility to environmental lung diseases, such as cancer, COPD and asthma. His research focuses on environmental lung diseases, smoking, cancer, COPD, asthma and inflammatory diseases. His team is currently engaged in translational research focusing on the elucidation of pathways and mechanism by which transcription factor Nrf2 regulates the pathogenesis of inflammatory diseases.

ABSTRACT

Air Pollution and SARS-CoV-2 infection: Association or Causality?

While most SARS-CoV2 infections in the ongoing coronavirus disease-2019 (COVID-19) pandemic are asymptomatic or have mild symptoms, hospitalizations, and mortality mainly occur in patients with co-morbid conditions such as obesity, diabetes, and COPD. Our understanding of the role of environmental exposures in modifying the response to SARS-CoV2 is emerging, and air pollution, smoking, and vaping have been associated with the worst outcomes of SARS-CoV2 patients. There is an emerging epidemiological association between exposure to high air pollution and the worst outcome. There is an urgent need to understand causality and host defense mechanisms, which are compromised due to environmental exposures and may increase susceptibility to SARS-CoV2 infection. The emerging data from epidemiological studies will be reviewed, and ongoing efforts on understanding the causality will be discussed.

Dr. Anurag Agrawal,

Director,

CSIR-Institute of Genomics and Integrative Biology

New Delhi,

India



PROFILE

Dr. Agrawal, is Director of the CSIR Institute of Genomics and Integrative Biology. After undergraduate medical studies at the All India Institute of Medical Sciences, Delhi (1994), he trained in Internal Medicine, Pulmonary Disease and Critical Care at Baylor College of Medicine, Houston, USA (2003), followed by a PhD in Physiology from Delhi University. After serving as an Assistant Professor at Baylor, He joined IGIB in 2007, taking over as Director in 2017. His interests are in smart deployment of emerging technologies towards healthcare and he is co-chair of the Lancet and Financial Times Global Commission on Governing Health Futures 2030: Growing up in a digital world. He received the Shanti Swaroop Bhatnagar Prize in Medical Sciences in 2014, National Bioscience Award in 2015, and was elected to Fellowships of the Indian National Science Academy and the Indian Academy of Sciences in 2018. He is also a Senior Fellow of the Wellcome Trust DBT India Alliance for Clinical and Public Health research and on advisory groups of the World Health Organization.

ABSTRACT

Air Pollution, Respiratory Disease, and COVID-19: Untangling the Connections

There has been speculation that air pollution may increase COVID-19 infections and/or mortality. While air pollution is well proven to increase respiratory infections, pneumonias, and chronic cardio-respiratory disease associated mortality, the proposed association appears premature. While there was a statistical link between pollution levels and COVID-19 deaths in the United States, there are many possible confounders including a simple exponential increase in COVID-19 transmission in crowded cities that also tend to have more severe air-pollution. On a global map, using deaths per million as the variable of interest, the most polluted countries have the lowest COVID-19 mortality rates. This too is confounded by lower age and possibly lower testing rates since the vast majority of these countries are low to middle income. However, interestingly there is clear evidence that COVID-19 infection risk and hospitalization rates are lower in smokers. This pattern is opposite to usual associations of infections and may depend upon interactions between airway receptor biology, innate immune system activation, and smoking. The inverse association with pollution and COVID-19 extends beyond air to water as well, with poor sanitation correlating with lower COVID-19 deaths. Innate immune activation due to repeated gut infections, or adaptive immune activation due

to feco-oral transmission of SARS-CoV2, are some of the possibilities. In summary, the complex relationship between air pollution, immune activation, airway ACE2 receptor biology, and SARS-CoV2 infection form a tangled skein that must be unraveled systematically.

Dr. Aakash Shrivastava,
Joint Director,
National Centre for Diseases Control (NCDC),
New Delhi,
India



PROFILE

Dr. Shrivastava, is presently the Head, Centre for Environmental Health and Occupational Health, Climate Change and Health at National Centre for Disease Control, Delhi. This Centre is the technical agency for implementation of the Ministry of Health's "National Programme on Climate Change and Human Health", under National Health Mission umbrella. This new health programme programme was approved in year 2019. After his MD, Dr. Srivastava went to National University of Ireland to pursue Masters in Public Health and Doctorate in Epidemiology. Prior to NCDC he has served other organizations inclusive of Indian Council of Medical Research, Indian Armed Forces and UNICEF. He has been a part of the founding team of Integrated Disease Surveillance Programme at NCDC, and served the Epidemiology Division at NCDC.

ABSTRACT

National Programme on Climate Change and Human Health: Air Pollution and Health related actions

While there were a lot of programs that were addressing issues of air pollution and mitigation by Ministry of Environment and other Ministries in India, in regards to combating impact of air pollution on health, the Ministry of Health, India initiated a new program in 2019 and it was named the National Program on Climate Change and Human Health. With its now presence in all states and UTs, it addresses air pollution by means of increasing awareness of health professionals and population, and also vulnerable groups. It also has initiatives about generating alerts, and surveillance of acute illnesses related to air pollution. It time and again issues advisories, runs IEC campaigns, social media campaigns, creates audio-video contents. The program has issued template health adaption plan to states and states have been advised to build a state specific plan. It also works with Indian Council of Medical Research and contributes to research strategy on Air Pollution issues.

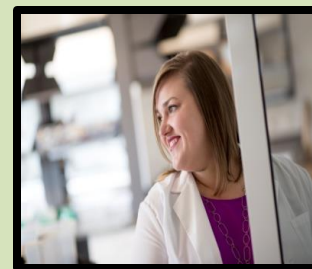


Technical Session -3

Panel Discussion on COVID-19 Lockdown on Air Pollution and Health

Dr. Kirsten Koehler

Associate Professor,
Environmental Health and Engineering Department,
Johns Hopkins Bloomberg School of Public Health,
Baltimore, MD,
United States



PROFILE

Dr. Koehler, is an Associate Professor in the Environmental Health and Engineering department at Johns Hopkins Bloomberg School of Public Health. She is the director of the master's program in Occupational and Environmental Hygiene and co-director of the doctoral program in Exposure Sciences and Environmental Epidemiology. She completed a B.S. in Atmospheric Science at the University of California Los Angeles. She then completed a M.S. and Ph.D in Atmospheric Science and a Postdoctoral Fellowship in Environmental Health Science at Colorado State University. She has expertise in exposure assessment and aerosol science with a focus on particulate matter air pollution and over 80 peer-reviewed publications. Her research goals are to improve exposure assessment methods to inform occupational and public health policy. Her research involves improving spatiotemporal exposure assessment using lower-cost technologies and improving personal exposure assessment methods to investigate the influence of micro-environment on health. Her team leads the exposure assessment for multiple federally funded air pollution epidemiology studies. She is co-PI of an EPA-funded Air in a Changing Environment (ACE) Center project that has deployed a low-cost sensor network in Baltimore, MD. Ongoing research includes the evaluation of the contribution of different sources to variability in pollutant levels and whether there are changes in air pollution exposures during the COVID-19 pandemic.

Dr. Pradeep Guin

Associate Professor,
O P Jindal Global University,
Haryana,
India



PROFILE

Dr. Guin (PhD, Public Policy, University of Maryland, Baltimore County) is an Associate Professor at the Jindal School of Government and Public Policy (JSGP), O. P. Jindal Global University (JGU), and a Visiting Fellow at the Centre for Social and Economic Progress (formerly Brookings India). His primary area of research lies at the intersection of health, environment and policy. He focuses on studying the impact of climate change on human health and health systems in the context of major climatic shocks, air pollution, vector-borne diseases, and mortality due to extreme temperature. More recently, he has developed a keen interest in studying the politics and governance of pressing environmental problems in India.

ABSTRACT

Understanding the impact of air pollution on health during lockdown: An economic perspective

Exposure to prolonged period of poor quality of air is known to affect our respiratory systems. COVID-19 being a disease of the respiratory system makes those exposed to poor quality of air extremely vulnerable to this disease. As COVID-19 cases started emerging in countries across the globe, most responded to it by imposing lockdown with various intensity. The Government of India imposed the first phase of 21-days of nationwide lockdown on March 24, 2020, which was extended several times. This lockdown ceased almost all of the economic and social activities. Closure of industries, construction activities, and restrictions in travel meant a significant reduction in toxic gases, leading to an improvement in ambient air quality and related health benefits. On the other hand, lockdown also meant staying indoors for longer duration. This meant that household members are increasingly exposed to poor quality of indoor air emanating from increased cooking, heating, smoking, etc. The benefits and costs associated with exposure to good/poor quality of air thus translates to the society and overall economy. In my presentation, I argue that the lockdown has provided us with an opportunity to create a more equitable society in the future. This could primarily happen in two ways: one, we adopt (and hence a required behaviour change) cleaner method of cooking, heating, traveling, and producing energy, to name a few, and demand from our government to introduce innovative environmental taxes.

Dr. Harshal Salve,
Associate Professor,
All India Institute of Medical Sciences,
New Delhi,
India



PROFILE

Dr. Salve, is currently working as faculty at Centre for Community Medicine, AIIMS, New Delhi. Dr. Salve did his MBBS from Government Medical College, Nagpur and completed post-graduation (MD) in Community Medicine at AIIMS, New Delhi. Dr. Salve has more than a decade of experience as a physician, public health trainer, community based researcher and public health professional at AIIMS, New Delhi. His interest areas are non-communicable diseases, climate change, air pollution, mental health and health system research. Dr. Salve worked with Ministry of Health, GoI at national level, State governments and international agencies such as World Health Organization on expert committees, research projects and technical reports. He has more than 35 publications on his credit in national and international peer reviewed journals. Dr. Salve is currently working on Join Collaborative project with IIT Delhi on mortality estimation due to PM 2.5. exposure in Delhi NCR.

ABSTRACT

COVID 19 and Air Pollution – Research needs and future directions in India

Nation-wide lockdown was featured as response to halt the transmission of COVID-19 in majority of countries. Nationwide lockdown due to COVID 19 resulted into halting industrial activities, movement of people, inter-country and intra-country travel. This resulted into decrease in concentration of air pollutants due to reduction of both industrial activity and road traffic related emissions. Most of the studies showed overall decrease in concentrations of CO, NO₂ and PM_{2.5} during lockdown period globally. However, the effect lockdown on improvement of air quality was short lived. Most of the research studies during lockdown were focused on its impact on air quality. In India too analysis of CPCB data showed improved of air quality across all parameter during lockdown period. However, during the month of October 2020 when economic and peoples movement resumed to normalcy, AQI across the country started returning to poor category. Few studies from European countries and China also specifically linked increase PM concentration and increasing severity of COVID 19 infection. Same is lacking in India. There is need to address following research questions using local data with more robust methods in India –

<i>Epidemiological research</i>	<i>Implementation research</i>	<i>Policy research</i>
<ul style="list-style-type: none"> <input type="checkbox"/> What is the association of major pollutants (PM, NO₂, O₃) and climatic variables on COVID 19 morbidity and mortality at national/ sub-national level? <input type="checkbox"/> What is impact of COVID 19 and air pollution on behaviors related to NCDs such as physical inactivity, tobacco smoking and healthy diet? 	<ul style="list-style-type: none"> <input type="checkbox"/> What is impact of various forms of lockdown on air pollution related morbidity and mortality? <input type="checkbox"/> What is the excess mortality due to air pollution related diseases attributed to COVID – 19 at national and sub-national level? <input type="checkbox"/> Does COVID 19 pandemic has inculcated behaviour change among population regarding mask use? 	<ul style="list-style-type: none"> <input type="checkbox"/> What is cost-effectiveness of lockdown (Complete/ partial) as a mitigation measure for reducing health impact of air pollution? <input type="checkbox"/> What is feasibility and sustainability of partial regular lockdown as intervention for improvement of air quality? <input type="checkbox"/> What are the policy level interventions such as use of IT, renewable energy, administrative restrictions for addressing air pollution as a long term strategy?

Building the technical capacity, restricted data access, quality of available data, administrative bottlenecks, funding a opportunities and Epidemiological issues such unknown confounders, ecological fallacy (for most of the ecological studies), challenging measurement of exposure at individual level are the challenges for the researchers. Multidisciplinary collaborative approach, Leveraging on existing technology, large epidemiological cohorts, HDSS sites and Strengthening both morbidity and mortality surveillance system ant national and subnational level are way forward to take the research agenda on air pollution forward in India.

Dr S Padma

Principal Scientist

CSIR-Central Road Research Institute (CRRI)

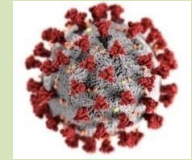
New Delhi,

India.



PROFILE

Dr. Padma, is one of the leading Principal scientist at CSIR-CRRI for many national projects. She Recipient of Commonwealth PhD Scholarship (UK) for 2011 - 2015 and completed PhD during this period at Leeds University, UK. She has professional experience of 15 years in the field of Transportation Planning & Traffic Engineering. She acted as thesis supervisor for M.tech student and summer training interns at CSIR-CRRI and undertook certain sections of Transport Planning course and Public transport course for the M.tech students of AcSIR. Worked in the capacity of demonstrator for the softwares SATURN, DRACULA and Omni-TRANS for the laboratory course work of MSc Engg students at University of Leeds, United Kingdom.



Technical Session -4

Panel Discussion on Addressing Extreme Weather & COVID-19 Synergistic Challenges

Dr. Shyamli Singh,
Assistant Professor,
Indian Institute of Public Administration (IIPA),
New Delhi,
India



PROFILE

Dr. Singh, working as an Assistant Professor with Indian Institute of Public Administration (IIPA), New Delhi, India. She is the coordinator of the Centre for Environment and Climate Change. Dr. Singh has her Ph.D in the ambit of Environmental management. She is a gold medalist from Indraprastha University and a topper from University of Delhi. Dr. Singh is the young Scientist with IRDR She has wide experience in research teaching & consultancy and leading project director of various prestigious projects and studies viz. Collection and Computerization of Legacy Data of Ganga sponsored National Mission for Clean Ganga, Ministry of Water Resources and Ganga Rejuvenation. She is the project director of Capacity-Building Strategies for Managing Complex Disasters in the face of Climate Change sponsored by National Mission on Himalayan Studies (NMHS), MoEF &CC. She is also the Principal investigator of human capacity-building programme under National Mission on Strategic Knowledge for Climate Change (NMSKCC) of Department of Science & Technology Strategic Programmes, Climate Change Programme (CCP). She has more than fifteen years of experience in different capacities. She has authored several textbooks, monographs, articles and discussion papers. She has been a panelist in various new item series chairing the sessions on Environment and related issues. She has also been the Lead speaker to UN World Toilet Day Celebration-2015 for achieving Mission Open Defecation Free, 2019. Dr. Singh has participated to establish MoU with Chinese Academy of Governance for faculty exchange and organize training programmes.

ABSTRACT

COVID 19 and Forest Fire: Story of Western Himalayas

The current COVID-19 pandemic is an unparalleled altruistic crisis, which intersects with the global climate emergency. Climate change has not stopped during the pandemic's global spread. According to the World Meteorological Organization, "a clear fingerprint of human-induced climate change has been identified on many of these extreme events". One of the extremes discussed is Forest Fire. At least an estimated 2.3 million people affected by wildfires globally, killing at least 53 people during the raging Pandemic. The overlap between peak fire season and pandemic response has made way for serendipity in forest fires in two Indian states Uttarakhand and Himachal Pradesh. The forests of the western Himalayas are usually devastated by fires in the summer, but this year was different. Just as temperatures started soaring, India went into a nationwide lockdown to contain COVID 19.

As the lockdown proceeded over a little less than 2 months, the number of forest fires in the Indian Himalayas dropped dramatically. Compared with numbers in previous years, about 80% fewer fires ignited in the region. The inadvertent experiment adds to evidence that humans are one of the main causes of forest fires in the region.

Mr. Kamal Kishore

Hon'ble Member,
National Disaster Management Authority (NDMA),
New Delhi,
India



PROFILE

Mr. Kishore is a member of the National Disaster Management Authority, India where he works on policy and planning, and anchors Prime Minister's initiative on the global Coalition for Disaster Resilient Infrastructure. He has a Bachelor's degree in Architecture from the IIT Roorkee, and a Master's from the Asian Institute of Technology, Bangkok. Prior to joining NDMA in 2015, he worked with the United Nations, the Asian Disaster Preparedness Centre and TARU. He has advised national governments in more than ten countries on disaster risk management issues and supported post-disaster recovery after major disasters in Bangladesh, India, Indonesia, Iran, Myanmar, Pakistan, the Philippines and Sri Lanka. His early work includes support to post-disaster reconstruction after the Uttarkashi (1991) and Latur (1993) earthquakes.

ABSTRACT

Key lessons for 2020

2020 has been an unprecedented year having so many of unreal experiences faced by human and other stakeholders of ecosystem due to extreme weather events starting from Australia's burning and followed by this super pandemic which generated need to be adaptive of this new ecological emergencies. The five key lessons learnt from this year that will be in need of future tackling of such events. Risk assessment tools must be to stay ahead keeping in mind of vulnerable groups associated with different kind of pandemics and extreme weather events. Second, learning should be focused on ability to repurpose or to readjust the policies that are going to require in the present scenario to hold the situation much better. Third, learning lies in protecting the frontline healthcare workers, which is one of the most critical tool to keep in mind as we have limited resources. The role of communities at local level during the intersection of extreme climate events and pandemics is the actual principal tool which can be relied upon by governments is the fourth outcome and in time of such calamities and emergencies what is our role as an individual to support the policies implemented by governments, focuses on individual roles as the final outcome during this year.

Ms. Suruchi Bhadwal,
Senior Fellow,
The Energy & Resources Institute (TERI),
New Delhi,
India



PROFILE

Dr. Bhadwal leads research activities in the area of climate change, focusing mainly on impacts, vulnerability and adaptation assessments. She has been with TERI since October 2000 and has contributed to several projects. Dr. Bhadwal listed as a UNDP regional roster of expert on vulnerability and adaptation. Furthermore, she has been identified as a Member by the Planning Commission as part of a Working Group on Climate Change and Environment for the 12th 5-Year Plan (2012-2017). She has also been closely associated with the International Human Dimensions Programme. She has contributed as a Lead Author for the IPCC AR4 WG II Report and has been a Review Editor for the IPCC AR5 WG II Report and the IPCC Special Report on Extreme Events.

ABSTRACT

Health Vulnerabilities and Adapting to Climate and its Extremes

The Impacts of climate on health are both direct and indirect. Climate and its extremes impact health in varied ways. Broadly, the IPCC explains 3 primary exposure pathways; direct exposure through weather variables such as heat and storms; Indirect exposure through natural systems such as disease vectors and pathways heavily mediated through human systems such as undernutrition. Besides local environmental conditions, public health, socioeconomic conditions, and adaptation play in influencing these exposure pathways and play a significant role in defining the vulnerability. This may either aggravate the impacts or reduce the nature of the impacts that is experienced. Adaptation has the potential to reduce adverse impacts of climate change, and therefore is going to be a necessary strategy at all scales and the world as a whole and countries will need to focus on it in the current context, near term and keeping in mind long term implications. Mix of approaches needed for instance: Investing in R & D, policy and practice.

Dr. Thomas Kirsch,
Professor and Head,
National Centre for Disaster Medicine & Public health,
Uniformed Services University,
Bethesda, Maryland.
United States



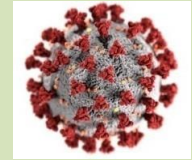
PROFILE

Dr. Kirsch is the Professor and Director of the National Center for Disaster Medicine and Public Health at the Uniformed Services University. He came to NCDMPH from Johns Hopkins University where he was a Professor of Emergency Medicine, International Health and Civil Engineering. He has worked in disaster settings for organizations such as the CDC, FEMA, the U.S. Departments of Defense and State, the WHO, PAHO and UNICEF, and American and Canadian Red Cross; responding to U.S. events such as hurricanes Katrina, Sandy and Harvey, and the NYC 9-11 terrorist attacks and global disasters including earthquakes in Haiti, Chile, New Zealand, and Nepal; floods in Pakistan, Typhoon Haiyan in the Philippines and Ebola epidemic in Liberia. In addition to his real-world disaster experience Dr. Kirsch is a globally recognized researcher and educator who has lectured extensively nationally and internationally on emergency medicine and disaster issues and taught numerous courses in disaster and emergency health and public health. He has authored over 150 scientific articles, editorials, and textbook chapters, and co-authored the medical textbook, *Emergent Field Medicine* (VanRooyen-Kirsch). His major awards include the inaugural 'Disaster Science Award' from the American College of Emergency Physicians (2013), the *Clara Barton Award for Leadership* from the American Red Cross (2014) and a commendation by President Obama in the White House as one of the Nation's, 'Heroes in Healthcare Fighting Ebola'.

ABSTRACT

Dueling Disasters - Disaster Response in the Age of Climate Change

How does one respond to a disaster during a disaster (pandemic)? 2020 has been a year that challenges all of our standard assumptions about disaster preparedness and response. For almost year we have been challenged by dozens of natural disasters during an ongoing pandemic that has killed over 1.2 million people worldwide. From humanitarian emergencies and refugee crises to the climate-related wildfires that have swept the globe disaster managers have had to adapt to a new, and the future, reality of multiple simultaneous events. New stresses have impacted the response community and health care systems around the world. In the face of increasing climate change related disasters emergency managers must completely reassess their preparedness and response activities.



Technical Session -5

Panel Discussion on Indoor Environment and Infectious Diseases

Mr. SA Verma,
General Manager,
Delhi Metro Rail Corporation,
New Delhi,
India



PROFILE

Mr. Verma is heading the Environment Department of DMRC. Mr. Verma has been associated with Delhi MRTS project from its first phase in 1998 and ever since, has been playing a key role in developing the sustainability strategy for Delhi Metro. He has overall 28 years' experience in enhancing sustainability of large-scale infrastructure projects. He specializes in driving beyond regulatory and performance standard requirements and innovate to enhance the sustainable value of infrastructure developments. He has been providing thought leadership in the areas of sustainability, energy efficiency, environment and climate change and finance. He has conceptualised and written Delhi Metro's Environmental Policy, Sustainability Policy, Water Policy, Solar Policy and Waste Management Policy and developed procedures and action plans for their implementation. He has developed environmental protocol for construction aspect of projects, which are now widely used by not only metros across the country but by many major construction projects. He has extensive experience with UNFCCC mandated CDM, International Environment Performance Standards, Green building, Energy Efficiency, Renewable Energy and Health Aspects. He is now looking ahead to promoting the idea of setting up a "Centre for Environmental Excellence" for transport sector that will not only crystallize the best practices so far but will provide a breeding ground for cross pollination of ideas from various experts from which will emerge solution to various issues confronting the society.

ABSTRACT

Precautions taken by Delhi Metro in Operations and Construction to contain COVID-19

DMRC is currently operating over a network of 348 Km covering 253 stations. In addition to the city of Delhi itself, it serves other satellite towns such as Gurugram, Noida, Faridabad and Ghaziabad. Before the onset of lockdown in India, DMRC was ferrying 43.93 lakh passenger journeys. In order to prevent spread of COVID-19, a national lockdown was announced and consequently, metro train operations came to a halt from 22nd March, 2020.

Due to lockdown, the services remained suspended till 06th September, 2020 and were reopened for general public on 07th September, 2020 in a graded manner and currently 12.25-lakh passenger journeys are being carried out by metro users on a daily basis.

In pandemic conditions, it was imperative for DMRC to gain confidence of the travelling public. Therefore, even before the onset of train operations, strategy was worked out and DMRC prepared a set of Standard Operating Procedures (SOPs) for Train services, Station Management, Rolling stock, AC units, maintenance work places etc. to minimize the COVID transmission.

Few of such SOPs include these for train operation, station management, rolling stock, maintenance work places, etc. Along with the SOPs, COVID test at stations are also being carried out. All such measures have helped DMRC in minimizing the transmission of virus in its premises

Since DMRC is also constructing 65.1 km of additional network as part of Phase-IV priority corridors, hence COVID precautions are also required at construction site. Hence similar efforts have been made at construction sites and specific SOPs have been prepared for the contractors to ensure that necessary steps such as provision of masks for workers at site, thermal scanning, site sanitization, mandatory COVID tests at site, etc. are taken. These are being followed by the contractor religiously to minimize the spread of COVID -19 virus at construction sites and regular DMRC inspection ensures their strict adherence.

Dr. Pratibha Kale

Associate Professor,
Institute Of Liver & Biliary Science (ILBS),
New Delhi,
India



PROFILE

Dr. Kale has graduated from Government Medical College, Aurangabad, Maharashtra and MD, Microbiology from PGIMER, Chandigarh with senior residency from AIIMS, New Delhi in 2015. She has accomplished her DNB in 2013 and garnered the Membership of National Academy of Medical Sciences in 2017. Dr. Pratibha is an NABH assessor. She has partaken in the Infectious Disease Certificate Course in 2014. Her major research interests are mycology, post-transplant infections and multidrug resistant pathogens. Dr. Pratibha is the member secretary of the Hospital Infection Control Committee. She is Associate of Royal College of Pathologists, London and the exam co-ordinator for FRC Path examination. She has received academic bronze medal at PGIMER and Dr. Bederkar Award for Physiology (2002). Received G.P. Agarwal Young scientist award. She has received NAWOPIA Dr. Pankajalakshmi V. Venugopal Prize for Best Paper in Mycology” at MICROCON 2014, USTI-IASSTD & AIDS Scholarship worth Rs 20,000 for at ASTICON 2014 and IAMM Silver Jubilee Best paper in parasitology, MICROCON 2015. Dr. Pratibha has received travel grant award from Indian Society of Hematology and Transfusion Medicine (ISHTM). She has received First Prize in Essay Writing Competition in Vigilance Week PGIMER Chandigarh.

ABSTRACT

Indoor Hospital Environment and Infectious Diseases

Health care-associated infections (HAI) remain a major cause of patient morbidity and mortality. 20% to 40% of HAI are caused due to cross infection via the hands of health care personnel, who have become contaminated from direct contact with the patient or indirectly by touching contaminated environmental surfaces. Multiple studies strongly suggest that environmental contamination plays an important role in the transmission of methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus* spp. Fungal infections surge when there is an ongoing construction activity in hospital premises. Hospital environmental temperature and pressure also play a major role in containment of infections. Patient isolation with maintaining adequate humidity and pressure changes prevent infections from spreading across the patients. Infection control is a team work where hospital internal environment is maintained by architectural framework,

temperature, pressure and humidity maintenance and sanitation facilities. Staff training on hand hygiene and infection control is inevitable component of hospital environmental control.

Dr. Ravindra Khaiwal

Additional Professor of Environmental Health

Department of Community Medicine & School of Public Health

PGIMER- Chandigarh,

India



PROFILE

Dr Khaiwal, is currently working as 'Professors (Addl) of Environment Health' at Department of Community Medicine and School of Public Health (DCM&SPH), PGIMER, Chandigarh. He had the visiting professor positions at the University of Antwerp, Belgium and the University of Padova, Italy. Ravindra has an outstanding academic record and obtained a Doctor of Science (DSc) degree from the University of Antwerp, Belgium. He has authored more than 110 articles, including original research papers, reviews, and book chapters. Some of his articles are listed as highly cited by 'ISI Web of Science'. His articles are cited over 8500 times, and he has a HIRSCH factor of '38' based on Scopus and other sources. Dr. Khaiwal is leading the task to draft 'Adaption/ Mitigation plan for diseases due to Air Pollution and Climate Change' as his department is a 'Center for Excellence on Air Pollution and Climate Change' under the National Mission on Health under Prime Minister Council of Climate Change, MoH&FW. He is also the nodal facilitator for the DHR-Fellowship Training Programme in the area of Environmental Health. Dr. Khaiwal also served as an expert in National Green Tribunal (NGT) cases. He is also a member of the Core Group to develop the methodology/guidelines related to health risk assessment under the Indian Health Ministry. Ravindra has received several awards and scholarships in the field of 'Environmental Health'. He has won an 'Environmentalist of the Year 2007: Around the Globe' award by the National Environmental Science Academy (NESA), India. In 2018, he was awarded IVLP Fellowship by the US Department of State, USA. Recently he has been listed among the top 1% Environmental scientist from India, having Indian rank as 7th and international as 176 by Stanford University. His research interests include health risks assessment, chemical characterization/composition of pollutants, source apportionment, and mitigation policies for persistent and emerging pollutants, including global climate change and environmental impact assessment. He has already worked on several international projects such as InterREG, EXPER/PF, ENVIRISK, CAIR4HEALTH, HENVINET, MEGAPOLI, and TRANSPHORM. Currently, he is working as an associate partner on UK/EU projects and jointly acquired funding of over \$ 640 thousand to the Department of Community Medicine and School of Public Health.

ABSTRACT

Indoor environment and infectious diseases: Household Air Pollution

As there is a change in weather and climatic conditions, people in urban and rural areas are spending more time in the indoor environment. Indoor environmental factors such as climatic conditions, air exchange rate, occupant behavior, housing conditions majorly affect indoor air quality. It is well established that indoor air pollution, specifically household air pollution, has been associated with the increased risk of Non-Communicable Diseases. Recent WHO and Global burden of disease studies highlight that over 4.3 million premature deaths could be attributed to household air pollution exposure. However, limited information is available on the progression and transmission of infectious diseases such as pneumonia, tuberculosis, fungal, bacterial, and viral infections in the indoor environment. The current COVID19 pandemic and limited information about its spread and control in the indoor environment have brought focus on infectious diseases. The talk stresses the need to improve scientific understanding and create awareness about infectious diseases for better control and management. There is a need to address factors such as the transition to clean fuel, well-being, and awareness to ensure healthy lives and promote well-being for all ages. Further, the talk also emphasizes adopting the 'ONE HEALTH' approach to better manage infectious diseases, which will help early achieving sustainable development goals (and specifically SDG 3,6,7,11,12 and 13) for social, economic and environmental sustainability.



Workshop Presentations

Dr. M.V.V. Murali Mohan

Civil Surgeon Epidemiologist,
Regional Training Centre,
Visakhapatnam,
Andhra Pradesh,
India



PROFILE

Dr. M. V. V. Murali Mohan is a public health specialist, who has worked in the medical and health departments in various capacities for the last 30 years. Currently he is working as Civil Surgeon Epidemiologist in Regional Training Center, Visakhapatnam.

ABSTRACT

Impacts of COVID 19 on Environment during and Post Lockdown

Restricted human interaction with nature during crisis time has appeared as a blessing for nature and environment. Nature is recovered while humanity stays at home. Climate experts predict that greenhouse gas (GHG) emissions could drop to proportions never before seen since World War II. Covid-19 outbreak pandemic, which restricts the daily mobility of people with its increasing effect worldwide, caused the closure of the factories, the stopping of education and training. The halt of social mobility and the reduction in greenhouse gas emissions in industrial countries. Besides serious limitations in international travel, entertainment, sports, hospitality, tourism, transportation, manufacturing and many other sectors were also affected by the outbreak. New Delhi was ranked as the most polluted city in the world by WHO in May 2014. But surprisingly during lockdown period the pollution levels significantly dropped to normal levels. The DO levels of river Ganga as per reports has gone above 8 ppm and BOD levels down below 3 ppm at Kanpur and Varanasi. which ranged around 6.5 ppm and 4 ppm in 2019. The wildlife has been relieved from anthropogenic impacts, few rare species also found during lockdown period.

Besides personal protective equipment (PPE) such as masks and gloves, a considerable increase in plastic usage has been related to requirements packaging, and single-use items. In response to COVID-19, hospitals, healthcare facilities and individuals are producing more waste than usual, including masks, gloves, gowns and other protective equipment that could be infected with the virus. There is also a large increase in the amount of single use plastics being produced. When not managed soundly, infected medical waste could be subject to uncontrolled dumping, leading to public health risks, and to open burning or uncontrolled incineration, leading to the release of toxins in the environment and to secondary transmission of diseases to humans. Other wastes can reach water sources. The toxic effect of spraying with chemicals such as chlorine on individuals can lead to eye

and skin irritation, bronchospasm due to inhalation, and potentially gastrointestinal effects such as nausea and vomiting. Just after the Indian government issued the first lockdown rule to cope with the increasing number of COVID-19 cases in March 2020, the energy consumption in India plummeted dramatically. However, as the lockdown relaxed, energy consumption started to recovery.

The worrying fact is with regard to the quality of air, COVID 19 has changed the human life into before and after pandemic phase. In New Normalcy people are avoiding public transport and opting for individual transportation, which causing deterioration of air quality. The port city Visakhapatnam has witnessed industrial accidents wreaks havoc in the city, during the phase of unlock process the LG Polymers accident claimed 15 lives, effected many and damaged the quality of air and water near vicinity of the industry. This presentation will discuss in detail on impact of COVID 19 on environment with reference to lock down at Visakhapatnam.

Keywords: Pollution, air quality, lockdown, climate **change**, **bio-medical waste**, **Covid-19**.

Dr. Shilpy Gupta

National Institute of Urban Affairs (NIUA),
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India



PROFILE

Dr. Gupta is Doctorate in atmospheric Science, Certified Energy Manager & Certified sustainability Assessor having more than 13 years of professional experience working on Urban Infrastructure, Renewable Energy & Social sector. She has worked on multisectoral projects focusing on Climate change, GHG mitigation, Renewable Energy, Energy Efficiency, across different continents in Africa, Middle East, Europe, USA and South East Asia in more than 25 Countries on Bilateral, Multilateral & Government funded projects involving institutions like ADB, World Bank, KfW, AfDB, UNFCCC etc. At present Shilpy works as Environment & Social Specialist at the National Institute of Urban Affairs (NIUA), India, where she is working for the CITIIS (City Investments to Innovate, Integrate & Sustain) program for the implementation of Environment & Social Safeguards across Smart cities. Her inclination towards academics and research has led to her association with different academic institutions as a visiting faculty for youth empowerment.

ABSTRACT

Achieving Better Public Health in Indian Cities through Urban Planning

Rapid urbanization and important health challenges require collective efforts and multisectoral approach to deal with this fast paced urbanization situation. This paper explores how urban planning can lead to development of healthier and active communities and result in better public health outcomes for Indian Cities. Based on peer-reviewed international literature in a broad array of health, planning, and environmental fields, it outlines the influence of urban planning on physical and mental health, and social and cultural vibrancy with a view to identify, challenges, and ways to overcome them to create a sustainable model of urban development in Indian cities. This paper focuses on how urban planning can become an enabler for improved public health in Indian cities. India's failure to produce healthy environment in cities can be attributed to several and interrelated reasons including the lack of focus on health in the urban planning processes. Sufficient evidence exists to reveal urban planning as a powerful tool for improving human health and wellbeing. This paper focus is on the role of city and local governments that are in a prime position to tackle the social determinants of health because of the breadth of their responsibilities over a defined geographical area, with powers cutting across different areas of public policy. This ability is important because of the way that health needs and outcomes are distributed spatially. This paper give emphasis on establishing the relationship between Urban Planning and public health in India. So far there has been deficient in integrating public health with urban planning policy and practices in India and how this can be achieved in India and what inputs are required.

The paper follows an evidence-based approach and explores the policy tools and implementation issues that urban planners need to be aware of to become health enablers. This research is based on the internationally recognized principle that urban planning directly impacts positive health. Significant effort is required to capture current understanding of this surprisingly overlooked subject.

Dr. Debanjana Moitra

International Institute of Health Management Research
(IIHMR),
New Delhi,
India



PROFILE

Dr. Moitra, is a BDS graduate and pursuing her Post Graduation in Hospital Management from IIHMR, Delhi. She is very keen towards learning and research; hence interested in taking part in various conferences. In 2019, she took part in patient safety week in IIHMR, Delhi where she presented a poster on Antibiotic Resistance .Also, during her Dental studies, she took part in International Dental Conference, 2017 held in Mumbai and presented poster on Alzheimer's Drugs: Creating Miracles. She also believes that soft skills are necessary as it helps conquer more than half of work. . Her interests include writing, painting and listening to soft music.

ABSTRACT

Environmental determinants of infectious diseases in metropolitan cities across India

According to World Health Organization (WHO), a pandemic is worldwide spread of a new disease. In Wuhan, China several patients with pneumonia were getting admitted in hospitals from December 2019 where 2019-Coronavirus was found to be the causative agent and the particular disease named as COVID-19. This disease may be present either as an asymptomatic infection or a mild to severe pneumonia with other respiratory symptoms and consecutively weakening the immune system of the body. Its spread to the other parts of the world was noticed hence WHO declared COVID-19 as a pandemic in March, 2020. The UN predicts that the world's urban population will almost double from 3.3 billion in 2007 to 6.3 billion in 2050. Most of this increase will be in developing countries like India. Exponential urban growth is having a profound effect on global health. Because of international travel and migration, cities are becoming important hubs for the diseases. Also, emerging and re-emerging pathogens have contributed to environmental change and has created an urgent need to understand how these will impact disease burden.

The environmental determinants found in case of Covid-19 are mainly air pollutants, temperature, relative humidity and gatherings. A study done in the US found that even a small increase of 1 $\mu\text{g}/\text{m}^3$ in PM_{2.5} levels was associated with an 8% increase in COVID-19-related fatality. Various studies have evaluated the lockdown initiated by Government of India scenario weighed against a scenario with a possible initiation of community spread due to crowded gatherings in India. The resultant changes, as against the lockdown scenario, have been reported in terms of the increase in the number

of cases and stretch of the timeline to mitigate the COVID-19 spread. Impact of environmental factors like temperature and relative humidity have also been analyzed using statistical methods & found that the spread of cases is dependent on environmental conditions, i.e. temperature and relative humidity. Similar study done in Italy found a correlation between high fatality due to COVID-19 and co-factor as air pollution. The dried virus on smooth surfaces retained its viability for over 5 days at temperatures of 22–25°C and relative humidity of 40–50%. The current article will present a framework that provides information about relationship between environmental determinant & change in metro cities across India. The disease transmission and a structure from which to unite desperate pieces of information is from a variety of disciplines that is expected to help the policy making and to device an improved action plan to alleviate the COVID-19 spread, in India.

Dr. Sazida Begum

International Institute of Health Management Research (IIHMR),
New Delhi,
India



PROFILE

Dr. Begum is currently pursuing PGDHM in healthcare management, enrolled as a 1st year student (Batch 2020-2022) in IIHMR DELHI. She has her expertise in public health, leadership, training, contributing and motivation necessary to carry out the proposed research project. She has served as a dental health advisor in corporate health organization and a health volunteer and educator in non-governmental organizations. Being an enthusiastic learner, my thought on it is: What's constant is learning through a ton of literature to constantly gain knowledge from whatever comes the way. Her primary area of interest is research for new health insights and innovative solutions to health problems, is always her domain of concern. Playing chess is my another area of interest and I say it portrays me, this game is not always about winning, it's about learning with each move, so each step in the phase of this life cycle is a step to learn with every motion.

ABSTRACT

Alterations in environmental change in elimination and control of malaria (focus covid 19) INDIA

Rising global temperature and the related effects on the ecosystem is of global public health concern, particularly in the developing countries. The sensitively to long term climatic change is a complex mechanism of environmental and social factors. According to WHO, Climate changes have adverse impact on infectious disease out of which, 17% of all infectious diseases are vector-borne disease. Emergence, declining and transmission of disease agents can be influenced by weather conditions. The World have known that the climate change and environmental determinants affect epidemic infectious diseases and are interrelated with each other. Changes in temperature and precipitation pattern of vector borne disease, long shifts in weather conditions and climate of the different seasons affects the geographical distribution, seasonality and incidence of vector borne disease. The spread of vector borne diseases involves 3 organisms including a vector, a parasite and a host. Environmental changes includes deforestation and new habitation, reforestation, agriculture and animal husbandry, local water control projects , urbanisation, urban crowding, loss of biodiversity, introduction of alien species and temperature change. Disturbances in the ecosystem and emergence of vector borne diseases are also exacerbated due to rapidly growing population.

The purpose of this study, is based upon 4 observations which include-

- a) A fuller understanding of vector borne disease interrelated with climatic change.
- b) emergence and re-emergence of vector borne disease

c) Social upliftment with education and awareness

d) Contribution of environmental sanitation in reduction of infection.

The literature review mainly discuss on the impact of climatic change on vector borne disease based on the scientific evidence of published literature. There is importance of upliftment of literacy among general population on vector borne diseases associated with climatic and environmental conditions, requirement for allocation of efficient technologies, contributing in sanitation, maintenance of healthy lifestyle and public health education.

Keywords: climate change, environmental factors, vector borne infectious disease, seasonality, sanitation, education.

Dr. Shivam Kapoor

Technical Advisor,
International Union against Tuberculosis and Lung Disease
(IULTD), New Delhi,
India



PROFILE

Dr. Kapoor is currently the Technical Advisor-Monitoring & Evaluation at International Union Against Tuberculosis and Lung Disease (The Union), New Delhi and involved in strengthening National Tobacco Control Program (NTCP) in India. He is also involved in carrying out research under various domains of tobacco control. He has previously worked as a Research Coordinator in the Tobacco Control Unit of International Union against Tuberculosis and Lung Disease, New Delhi. He led two research studies in collaboration with Johns Hopkins University, that investigate Tobacco Advertising, Promotion and Sponsorship: Bidi and SLT product Mapping and Film Rules Compliance, involving regional monitoring across 11 states of India.

He has an MDS in Public Health Dentistry from Government Dental College and Research Institute, Bangalore and BDS from Manipal College of Dental Sciences, (Manipal University). With his experience at Maulana Azad Institute of Dental Sciences, New Delhi, he excelled in organising Dental Public Health programmes and clinical practice, supervised post graduate students for research projects and dissertations, carried out Tobacco Cessation Counselling in both clinical and community settings. He was also involved in the Pit and Fissure Sealant Pilot Project, an initiative by National Oral Health Program under MOHFW. His areas of work include, inter alia, amassing scientific evidence and addressing public health issues.

ABSTRACT

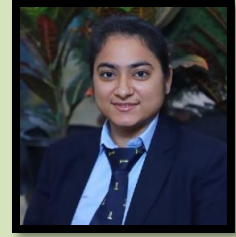
Tobacco use, exposure and disposal: A Potential Environmental Determinant of COVID-19 in India

As humans spread across the world, infectious diseases have been a constant companion. Most opportunities to prevent disease require deeper understanding of the *epidemiological triad*, so that the slightest exposure to a potential environmental factor can be reduced or the pathogenic can be interrupted. In March, 2020, WHO announced that a novel coronavirus disease 2019 (COVID-19) had transformed into pandemic. As the pandemic of COVID-19, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is still under progression, risk factor identification remains a challenge. We have witnessed that COVID-19 fatalities are higher among people with pre-existing conditions including Non communicable diseases (NCDs). And tobacco use classifies as the core common risk factor linked to NCDs and second hand smoking (SHS) is associated with risk of acquiring Tuberculosis. This presentation discusses: 1) Tobacco use as a potential environmental

determinant in COVID-19 pandemic progression; 2) Smoking, SHS and tobacco-related diseases as prognostic factors for severe COVID-19; 3) Symbiotic relationship between COVID-19 crisis, tobacco consumption and SHS; 4) Tobacco control-a greater imperative in the context of pandemic; and 5) Evidence of deceptive behavior of Tobacco Industry in relation to sustainable developmental goal (SDGs) during the pandemic. The unparalleled countermeasures ordered and executed in response to the pandemic, particularly social distancing and lockdown, even envisioned a 'self-reliant' or 'self-sufficient' India (Atmanirbhar Bharat). Although our national and sub-national governments have responded by proposing, "No spitting/smoking" policies to halt the pandemic transmission through a slew of measures, but are these enough? Given the enormity of the problem and its impact on the health and economy, should radical tobacco control measures be taken to prevent exposure to tobacco smoke and spit that is contributing factor for COVID-19 transmission. In conclusion, pandemics do not arise in a vacuum and the mathematics of outbreaks varies dramatically with every contributing factor. It is imperative that the epidemiologists must carry out impressive sleuthing, rapidly tracking and joining all the pieces of the puzzle. The decision-makers and public advocates must be vigilant in ensuring that public health responses are consistent with respect to tobacco use behavior, SHS exposure and disposal of tobacco waste in the environment. In addition, researchers and the media have a responsibility to be cautious in communicating and disseminating findings that might promote commercial industrial agendas.

Dr. Tavleen Kaur Malik

International Institute of Health Management Research
(IIHMR),
New Delhi,
India



PROFILE

Dr. Malik is currently doing Post Graduate Diploma in Health Management (MBA equivalent) from International Institute of Health Management and Research, New Delhi. She is also pursuing Diploma in Human Rights, Refugee Law and International Humanitarian Law from ISIL, New Delhi. Her endeavour is to work for the betterment of the community and the Public Health sector gives me the opportunity to encourage, empower and mobilise my skills towards my goal.

ABSTRACT

Tracking Causal links between Water Contamination and Infectious Diseases

Background: The roots of Public Health are majorly concerned with Environment changes. The introduction of antibiotics, vaccines, pesticides and other barriers to infection revolutionized public health. Public Health usually doesn't require immense innovations to bring the change, with little tinkering in the existing system can bring about changes. Since last decade a majority of Infectious Diseases either emerged or re-emerged due to Environmental Changes. Diseases such as Malaria, Lyme disease, Schistosomiasis, Dengue fever, diseases caused by *E. coli*, Diarrheal diseases, Cholera, Hepatitis A, Hepatitis E, Rotavirus, Typhoid fever, Hookworm, Tape worm have one common risk factor- Contamination of water which is one of the Environmental Determinant. Contamination of water has resulted due to Climate Change, Deforestation, Water Projects, Agricultural intensification and Urbanization. In order to reduce the burden of these Infectious Diseases and simultaneously prevent any emerging pandemic, it is very vital to understand the interplay of environment change and the transmission cycle of a pathogen.

Purpose: India presently is facing triple disease burden which are Non-Communicable Diseases, Communicable Diseases and Road Traffic Injuries. As per the UNDP reports, 5.2 billion people had safely managed drinking water in 2015, but 844 million people still lacked even basic drinking water, 80% of wastewater goes into waterways without adequate treatment and about 7 million people die every year from exposure to fine particles in polluted air. Along with the rising burden of NCDs, emerging infectious diseases due to environmental determinants is also posing a challenge for nations.

Methodology: This study is Descriptive with the primary objective of understanding the interplay of water contamination and infectious diseases and providing solutions and interventions to improve

the water quality. The literature was searched through Google Scholar and PubMed to obtain relevant studies using combination of following search terms, “Environmental Determinants, Sustainable Development Goals, Infectious Diseases, Disability Adjusted Life Years and Burden of Disease”

Conclusion: In order to improve the Environment Determinants and reduce Infectious Disease requires an intersectoral approach. It is the duty Central and State Government, Healthcare Providers, Organizations, Schools and every citizen of the country to indulge in activities that improves the environment. India has both National and International obligation to ensure Right to health of all the citizens. Sustainable Development Goals such as Goal 3: Good health and Well being, Goal 6: Clean water and sanitation and Goal 13: Climate action are interrelated and together they motivates every country in the world to protect the Environment and address the Climate change, Urbanization, Deforestation, Dam Projects, Agriculture practice. The time has come where every nation needs to be responsive and responsible towards the Climate Change in order to prevent the burden of Infectious Diseases and be prepared to handle any unprecedented situation in future

Dr. Neha Mishra

International Institute of Health Management Research (IIHMR),
New Delhi,
India



PROFILE

Dr. Mishra, is currently pursuing PGDHM (Health Management) From International Institute of Health Management and Research, 2019-2021. She has done her BPT from SGT University in 2018. She has a year work experience as Manual Therapist at EEZ Align, Gurugram. She has her research interest in communicable diseases and their related health concerns.

ABSTRACT

Impact of Covid-19 Industries Employee's Status Hand Hygiene in Neemrana region

Severe acute respiratory syndrome coronavirus 2 (SARS-2-CoV-2) cause of Corona virus disease in 2019 which spread across the globe, As per WHO this Corona virus declared as a Pandemic where the work load condition is unpredictable to the industries regions, demands due to transmission from human to human contacts all the industries being shut down, decrease its productions it effects every industries region. Economic crisis have been around the world due to COVID -19 .Industries adapt new technology and concept according to market conditions to improve consumer demand, globally supply chain, demand supplies to the consumers which all are being affected. Neemrana famous for its industrial regions, which is under by the Rajasthan Industrial Development & Investment Corporation (RIICO)

Purpose of this study to get to know about the employee's condition who doing their work in industries maintained hand hygiene compare in their respective companies. It also show the employment status before and after Covid-19, work stress, work interest, decisions making.

Keywords: Covid-19, Pandemic, Industries, Hand Hygiene, Employee's status, Pressure, Stress

METHODS & FINDINGS:

- In the survey employees consent taken for the survey with some basic information about their age, gender, their highest degree of education, occupation status before & after Covid-19, Hygiene maintenance, concentration over work, stress lifestyle changes like food pattern, sleep patterns
- Selection criteria: Cross Sectional Descriptive method is being here.
- **Data Sources:** Primary source: Structured questionnaire with demographic data including employment status before & during Covid-19, residential conditions (family

time, food habits, sleep pattern) and details of hand hygiene practice in industries, collected through Google form which was disseminated through email and instant messaging applications.

- Secondary source: A thorough literature review of relevant articles was done in databases of reputed journals, PubMed, Google Scholar, and ProQuest using the appropriate key words surveys being filled.
- Data extraction: The information was collected through google form & transfer after the in the excel sheets
- Around 97.9% people are agree to fill the survey form, out of 147/150. In the survey 77.3% approx. 116 respondents are male whereas 22.7% around 34 are females.

CONCLUSIONS:

In the survey, we come to know about people more frequently wash their hands in industries, maintain social distance, apply mask or cover their face properly after the company opening. They feel less stress & depressed perform their work, able to spend their time with their family members. Lifestyle pattern being changed. Max, while but max. point of view being same that in the lockdown changes their working conditions, working pattern, social life, skills etc. all being affected.

Dr. Soumya Rani Gouda

Xavier University,
Bhubaneswar, Odisha
India



PROFILE

Dr. Gouda is a doctoral scholar of Xavier School of Sustainability, Xavier University Bhubaneswar (XUB). Research interest is in the area of Health management. She has qualified UGC-NET (Asst. Professor) July 2016, in the subject of Social Work. Her professional experience started with the Tribal Development Department, Government of Gujarat as a District Project Consultant in Dairy Development project. Thereafter, she joined Ekjut, a registered development organization in India collaborating with UCL-Institute of Child Health, London for a project for improvement of maternal and newborn child health in Jharkhand and Odisha, states of India. In addition she has worked as a Research Associate at NIT, Rourkela in the department of Humanities and Social Sciences.

ABSTRACT

Archaic cooking set up in the tribal community ignites infection of Tuberculosis and susceptibility towards COVID-19.

As per the World Health Organization (WHO)ⁱ, around 3 billion people still use solid fuels and nearly 3.8 billion people die prematurely in a year due to pulmonary infection caused by indoor pollution. The inefficient cooking practices have been researched as one of the sources for respiratory tract infections. Odisha state is a tribal state with maximum numbers of Particularly Vulnerable Tribal Groups and archaic cooking procedure continues. With this background, Gajapati in Southern Odisha state, which is a tribal dominated district (67% of the populationⁱⁱ), is considered as the study area. It has been documented that the prevalence of tuberculosis (TB) was 84%ⁱⁱⁱ in 2019 in the district. The district is also home to PVTGs namely Lanjia Saura and Saura. It is observed that the rural-tribal community uses the primitive method of cooking at their households (wood and earthen *chula*). Alternative use of fuel such as cooking gas is not a common sight due to hard to reach locations and non-availability of the cooking gas under Government scheme. In terms of finance, the rural-tribal population is not economically sound to keep using the gas connection. Their source of income mostly depends on daily wage as there are low cultivable land due to the topography and practice. COVID has impacted the purchase parity of the tribal community. In the Pandemic situation of COVID 19, it was seen that people with co-morbid condition such as respiratory problem, heart disease, kidney problem and other chronic Non Communicable Diseases (NCD), were vulnerable to COVID 19 infection which resulted in increased mortality. The Tuberculosis and COVID 19 infection both carry similar symptoms and affect the lungs. Therefore, prevalence of Tuberculosis among the rural-tribal/PVTG community would be the smoke out of the existing cooking process, inadequate cooking space and ventilation. Women in the family have the major role of cooking so they are prone

to TB as the smoke is also toxic like tobacco and women take care of other members of the family thereby transmitting the disease to the remaining family members. If the source of the disease is not prevented from home, it would give rise to chronic ailments affecting health and economy of the household which eventually would impact the health of the community. Exposure to the household air pollution is preventable but resources and interventions are limited in the low income tribal population with competing health priorities especially during this COVID pandemic situation. To address this concern, recommendation would be to design a culturally accepted customized smokeless *Chula* as per the need of a particular community for making it easy and healthy for the community to carry out the daily chores. This research study will help in contributing to SDG 3 (good health and well-being), SDG target 7.2 on access to clean energy in the home.



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