



सत्यमेव जयते

Ministry of Health and Family Welfare
Government of India

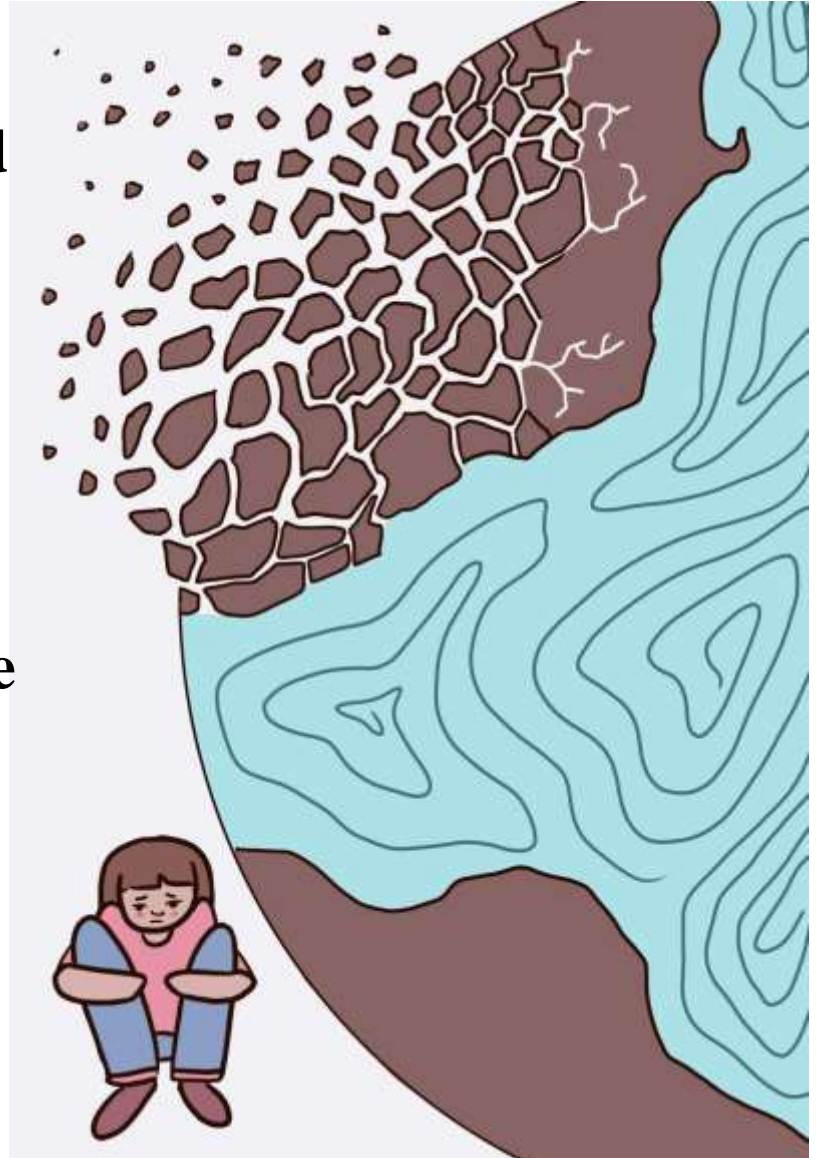


Climate Change and Mental Health

Training Module Children

National Programme on Climate Change and Human Health

MINISTRY OF HEALTH
AND FAMILY WELFARE



National Programme
on Climate Change
and Human Health

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SECTION 1- CLIMATE CHANGE- IS IT REAL?

Climate change and environmental degradation undermine the rights of every child
- UNICEF

The United Nations Framework Convention on Climate Change (UNFCCC), Article 1, defines climate change as "a change of climate which is attributed directly or indirectly to human activity, that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods." Thus, the UNFCCC distinguishes between climate change attributable to human activities altering the atmospheric composition and climate variability attributable to natural causes. Climate change refers to a complex set of occurrences that includes, among other things, large changes in the underlying world surface, particularly in sea temperatures, precipitation, and wind patterns, which can occur over decades or more. Changes in weather and climatic systems cause extensive disruptions, even though individuals living in those areas are accustomed to them.

No direct causal relationship between Climate Change and Mental Health has been scientifically established. However, according to a growing body of empirical and theoretical study, climate change-related events, including acute (e.g., floods, wildfires), sub-acute (e.g., prolonged heat stress), and chronic (e.g., drought) occurrences, are connected with elevated mental-health risk (Lawrance et al., 2021; Watts et al., 2018, 2020; Charlson et al., 2021). Furthermore, these different kinds of exposure appear to be linked to an increased risk of various mental-health outcomes; for example, long-term weather-related events, such as prolonged droughts, are more strongly associated with mood disorders, whereas acute events, such as floods, are more strongly associated with anxiety disorders, PTSD, and other mental health outcomes.

Severe weather disasters can destroy or interrupt key infrastructure for children's safety, such as schools, health facilities, and transportation. Droughts and flooding may wreak havoc on agriculture, impair water infrastructure, and pollute water supplies. At the same time, not as dramatic, slow-onset climate change consequences can still jeopardize development achievements and livelihood possibilities. Rising temperatures and shifting rainfall patterns are predicted to aggravate the spread of vector-borne illnesses like malaria and dengue fever due to climate change.

DEVELOPMENTAL RISKS

Most disorders begin in early life and are influenced by physiological, neurobiological, and behavioural environmental responses. The severity and timing of exposure to risks will impact the cognitive, behavioural, and emotional development, including resilience and well-being. Children and adolescents are particularly susceptible to mental health risks and face an unacceptably high illness burden, according to a UNICEF report from 2021. Children require a secure and predictable environment, becoming increasingly scarce due to climate change and natural disasters, impairing their socio-emotional processing. Adverse Childhood Experiences (ACEs) can have long-term consequences on one's health and well-being, as well as on risk-taking behaviour and trust. This has been especially documented during the COVID-19 epidemic.



HOW ARE CHILDREN AT RISK?

The influence on children begins even before they are born. Fetuses are subjected to climate-related disturbances as their mothers, with potential consequences including cognitive deficiencies, mental problems, and physical health issues (Pacheco, 2020). Furthermore, in infants exposed prenatally to the Zika virus, certain diseases linked to climate change can have a significant and long-term influence on the brain development (Mlakar et al., 2016). Climate change-associated events such as storms, floods, and wildfires may become more frequent. During a major disaster, families may be forced to flee their homes, lose possessions, and have difficulty obtaining food and safe drinking water. These traumatic events may lead to mental health issues in children, such as sadness, anxiety, and post-traumatic stress disorder (PTSD) or long-term developmental consequences of early-onset clinical/ sub-clinical distress.

According to qualitative studies, many children have negative perspectives about climatic futures, and interviews with youngsters in many nations revealed high levels of climate and eco-anxiety. Climate anxiety is rational and does not imply mental illness unless it results in significant psychosocial dysfunction. Climate anxiety can be connected to many emotions, including worry, fear, anger, grief, despair, guilt, and shame, as well as hope, although the presence of these varies between individuals. Children are vulnerable and sensitive during their developmental years. Climate change can have long-lasting consequences, such as altering a child's developmental potential and trajectory. Traumatic mental events, like physical ones, can have long-term effects.

Children who have experienced a severe weather event before age five have greater anxiety and sadness levels than adults. (MacLean and colleagues, 2016)

Noise pollution occurring at night and in the daytime is associated with delayed bedtime and short sleep duration among children (Liu et al., 2020; Hunter & Hayden, 2018). The effect of noise pollution is likely mediated through stress-sympathetic hyperactivity and greater cortisol level.

Exposure to particulate matter greater than 2.5 microns (PM 2.5) during 31-35 weeks of pregnancy reduces total sleep time in children aged 4-5 years (Bose et al., 2019). These children were found to sleep for 8 hours/day compared to the recommended 10-13 hours. Effects of air pollution (PM 2.5, PM 10 and NO₂) are mediated through inflammation in the upper and lower airway (direct effects of air pollution on mucosa and allergy-mediated effects of pollutants), production of reactive oxygen species and change in neurotransmission in the brain due to contaminants (Cao et al., 2021).

Earthquakes and tsunamis have a long-lasting effect on sleep. Several studies have shown that direct and indirect exposure to an earthquake is associated with sleep disturbances among children and adults, even months to years later, in the form of difficulty falling asleep (Tang et al., 2018), shorter sleep (Usami et al., 2013; Tang et al., 2018), poor quality sleep (Tang et al., 2018) and daytime dysfunction because of poor sleep (Tang et al., 2018). Interestingly, sleep duration was an independent problem and was not explained by post-traumatic stress symptoms. (Usami et al., 2013)



SECTION 2: WHAT'S HAPPENING IN INDIA?

India is a young country, with 40% of the population under 18. This means that any influence on the environment, disasters, or climate will significantly impact India's children, particularly those on the margins, in terms of their fundamental needs for health and nutrition, education, and protection. Increased malnutrition coupled with vector and water-borne infections, hunger, loss of learning and livelihood, as well as exploitative conditions such as child labor, trafficking, and child marriage, to name a few, might have devastating implications.

Extreme and irregular weather events such as floods, cyclones, and erosion are becoming more common in disaster-prone parts of India, causing a negative impact on the lives of children and their families. As a result, children are forced to leave their homes and schools, their health and family livelihoods are jeopardized, and their access to healthcare is restricted.

"Climate crisis pulls Indian children from homes and classrooms", as per year-long research spanning floods, droughts, and cyclones in three states: Uttarakhand, Madhya Pradesh, and West Bengal, intending to document the impact of climate change on children. The study's main conclusions were:

- At least 60% of families indicated climate issues influenced their financial status
- Up to 90% of people believe that climate issues have a detrimental influence on drinking water
- Up to 75% of households had their homes destroyed as a result of climate-related incidents
- Up to 14% of those polled knew at least one family member who had to relocate due to a climate-related disaster. Up to 20% of respondents in some locations expressed a desire to relocate
- Depending on the area, up to 58% of respondents reported that rising temperatures caused health problems for their children, such as dehydration, skin illnesses, and allergies
- More than half of the youngsters in certain areas stated they couldn't play outside because of the heat



The four core principles of the United Nations Convention for the Rights of Children are non-discrimination, devotion to the child's best interests, the right to life, survival, and development. However, they seem to be compromised due to climate change.

According to a recent study by Save the Children, if the planet continues to heat up at current levels, children born in 2020 will experience more heatwaves, floods, droughts, and wildfires across their lifetimes than the previous generations. On average, these children will face three times as many climate disasters as their grandparents and almost seven times more heatwaves across their lifetimes compared to a person born in 1960.

Children are more likely than adults to develop PTSD and depression due to traumatic or stressful events. Children may exhibit more acute suffering following extreme weather disasters than adults (Fritze et al., 2008). Two years following a flood, children had higher risks of PTSD. (Fernandez et al., 2015). Children's mental health can be influenced by their personal experiences with stresses such as environmental disasters, harsh weather, and eco-migration and their caregivers' mental health (Simpson et al., 2011). Children are especially vulnerable because they rely on their social networks, such as family, relatives, guardians, or the state, for their needs when affected by climate change.

The direct and indirect outcomes of climate change on children are listed below-

Distress, Grief, Depression

Strain on Social Relationship

Substance Abuse

PTSD and Anxiety Disorder

Resilience and Post-traumatic growth

SECTION 3: EFFECTS OF CLIMATE CHANGE

Heat waves, air pollution-related illnesses, floods and other extreme events can impact children differently.



Most of us become irritable in extreme heat and feel agitated or listless. Heatwaves, on the other hand, are not only unpleasant periods; they pose serious health hazards, including the chance of death. Heatwaves have surpassed hurricanes, lightning, tornadoes, floods, and earthquakes as the deadliest meteorological disaster. India has been recording increased heat waves since the last decade. In summer, children like to play outside of their homes. But due to high temperatures and high humidity, it has become difficult for children to play outside due to the risk of dehydration, heat cramps, and heatstroke because their bodies are less efficient at cooling. (Mary L. Gavin, MD, 2019)

Heatwaves can have an impact on the sleep, learning, and cognitive performance of children. Climate change can lead to abnormal developmental alterations that hinder healthy psychological maturation throughout life.

One standard deviation of temperature increases leads to increased interpersonal and group violence. Suicide rates also increase during extreme heat. Sleep deprivation can alter mood, depression, and cognition. A dip in core body temperature triggers normal sleep start and maintenance. High heat causes sleeplessness, exacerbated when combined with increased humidity and can affect mood and cognition.

Adolescents with severe psychotic or emotional problems and substance abuse disorders, which can accommodate minimal executive functioning during normal weather, are challenged during extreme heat and may lose their capacity to prepare, make good judgment, and efficiently care for themselves.

WHO estimates that in 2016, 600,000 children died from acute lower respiratory infections caused by polluted air. They inhale more quickly and through their mouths, which cannot filter microscopic particles or dust. As a result, they are particularly vulnerable to the impacts of smoke or pollution. They also spend most of their time outside the house, playing or participating in other activities. They also stay nearer to the ground, which could be dusty or unclean. Breathing polluted air (smoke/gases) has a long-term effect on lung function.

Air pollution affects children's neurodevelopment and cognitive ability, causing asthma and cancer, and may even lead to depression. There is evidence of an association between air pollutants and depression in children (Lim and colleagues, 2021). Exposure to high levels of environmental pollutants like lead and cadmium has been implicated in the development of schizophrenia through their effect on neurobiological pathways. According to research, higher levels of ambient air pollutants in early childhood have been linked to autism spectrum disorders and psychotic illnesses later in life.

CHILDREN:

Children experience displacement, loss, death, and destruction due to disaster/extreme weather events that disrupt their relationships and familiar environment. This leads to physical and emotional insecurity among them.

Why are children bothered?

- A familiar environment suddenly becomes scary and unfamiliar.
- Living with adults who are equally worried and concerned.
- Struggle to deal with unusual circumstances.
- Loss of belongings like toys, books, dresses, and pets.
- Loss of loved ones, parents, siblings, family members, and friends.
- Persistent threat to the sense of well-being.

Behavioural symptoms of psychological distress and sleep disorders in the context of familial or psychosocial adversities, including the consequences of climate change-

Pre-school (1-5 years)

- Temper tantrums
- Crying- Whimpering or screaming
- Clinging
- Regressive behaviour
- Easily frightened/angry
- Sleep disturbances
- Poor sleep quality
- Obstructive sleep apnea

School-age (6-11 years)

- Aggressive
- Bed-wetting
- Change in appetite
- Nightmares
- Sadness and apathy
- Disobedience
- Sleep disturbances
- Poor sleep quality
- Obstructive sleep apnea

Adolescence (12-18 years)

- Isolation/depression
- Irritability
- Risk-taking behaviour
- Substance abused
- Sleep disturbances
- Poor sleep quality
- Obstructive sleep apnea



SECTION 4: INTERVENTION FOR CHILDREN IN EXTREME WEATHER EVENTS

What parents or teachers can do?

- Reassure children that they are safe.
- Provide guidelines for sleep hygiene
- Identify children with sleep problems and refer them to specialists
- Provide opportunities for the children to talk about their fears.
- Share how various people are coping and overcoming this event.
- Do not stress too much about academic achievement immediately after a disaster.
- Reassure children that the event was not because of their fault.
- Do not criticize the regressive behaviours that children might display.
- Use play, art, and other creative mediums and discussions to reach out to children using facial expression cards, clay modelling, drawing, writing, and family of dolls and portraits.
- Encourage children to develop coping and problem-solving skills to handle anxiety.
- Identify children who need extra help to cope and refer them to a specialist.
- Let them know that it is normal to feel upset after something bad happens and allow them to cry and express their feelings.
- Answer their questions honestly and repeatedly whenever they ask.
- Children struggle with the need for safety and predictability after a loved one's death. Having conversations with them about what's going to happen the next day, the next week; what their routine will be like; who will be available; and addressing specific concerns they have can aid them in coping better with the loss.
- Making children feel involved, and giving them small responsibilities throughout the day, can make things feel 'less strange' and 'more in control.'
- Making children understand the indicators of heat stress and how to mitigate the effects of heat (maintaining a work-rest schedule, self-hydration, etc.)

The age-wise suggestions below are not water-tight. Individual children may react very differently. Some children may regress under psychological stress, such as bereavement. It is important to support the child at their level, alongside constantly encouraging (not demanding or forcing) age-appropriate behaviour. Other children may behave more maturely for their age. Here again, respond to the child. Don't try to change or guide them to a 'desired' level.

Infants and toddlers

- Physical comforting measures and consistent availability make infants and toddlers feel secure and comfortable
- Paying attention to basic needs– feeding, toileting, daytime/nighttime sleeping – to ensure their natural rhythms are maintained
- Spending time observing them play/engaging them in play, especially sensory games, fulfil their attentional needs and make them feel cared for.

- Older toddlers may ask about the event that occurred (disaster). Respond to those questions but truthfully. Take time and space to do this, such that you can be with and comfort the child.
- Some young ones may repeatedly play out the event with their toys. This may be part of normal processing and should not be completely stopped. You could ask the child questions about what they are doing, see if they have questions, see if they seem to have misunderstood anything, and make suggestions in the play to help them understand things correctly.

Young school going, children

- Physical comfort and consistent availability are important; however, one may have to follow the child's lead/ ask the child if, e.g., they want a hug or they want to sit with/talk to you.

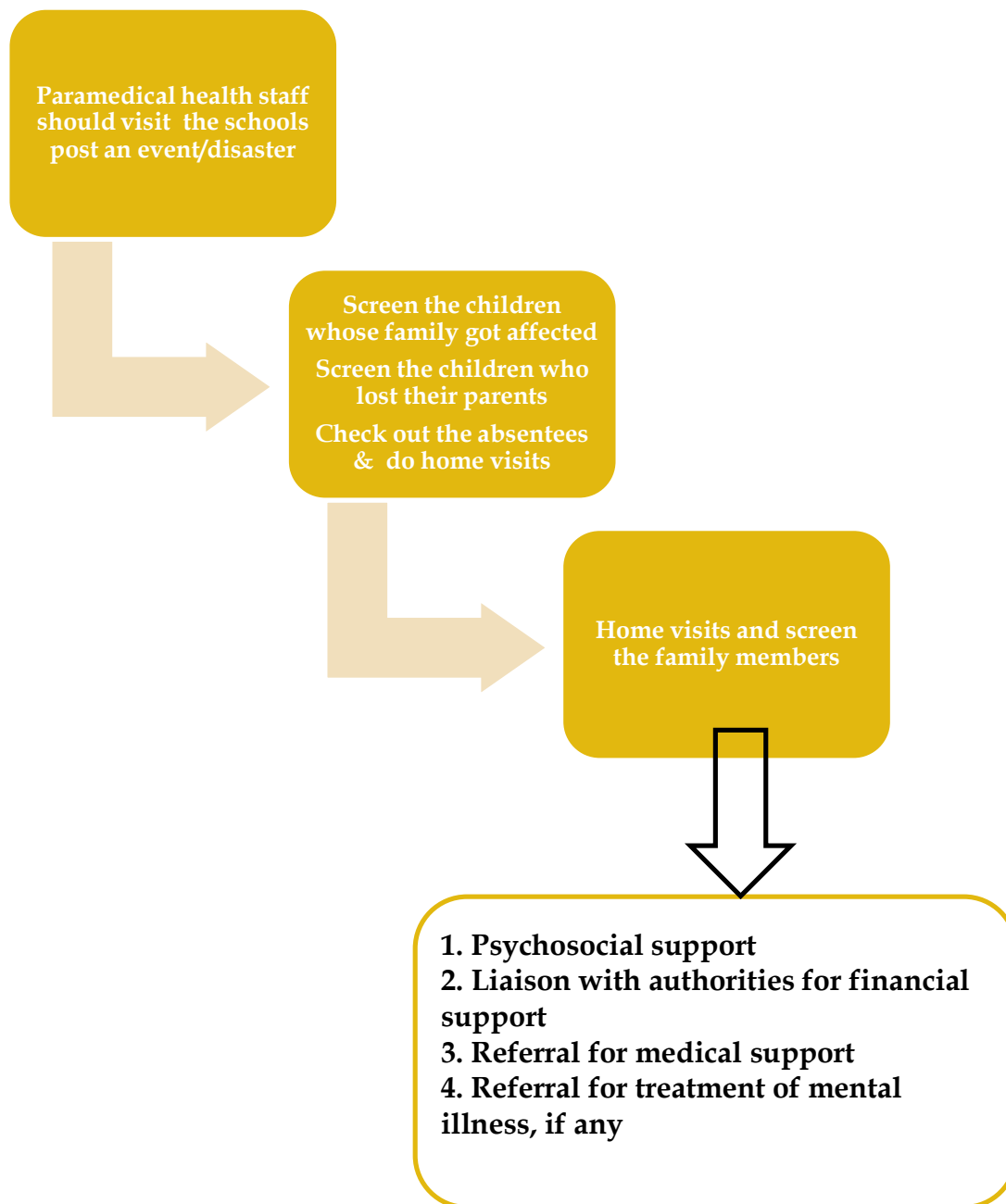


- Telling the child truthfully in short, simple sentences about what exactly happened.
- Constantly watch for the child's response to what you're saying. Take pauses. Check for what they're thinking/feeling. Help them label their emotions. Encourage them to talk about things they may have found confusing/difficult to understand.
- Help them understand all the changes that may have to be made to their routines and who would be available for them at which time.
- They need to be briefed about what will happen in the next few days.
- Talk about what they can do and with whom when they remember/miss the loved one.

Older children (pre-adolescents and adolescents)

- As children grow older, their understanding develops. While telling them what happened may not be needed, as they would have already figured it out, it is important to be with them.
- They may come up with questions, and those should be answered truthfully.
- Some youngsters may not want to talk for days, and their silence needs to be respected. You could say, "It's ok if you don't want to talk about it right now. I'm here whenever you feel like talking."

Post Climate Change/Disaster



SECTION 5: WAY AHEAD

Children are the least responsible for climate change, yet they are to bear the greatest burden of its impact. Thus, it is our responsibility to build children-friendly spaces and environments. How can we build cities, maintain clean surroundings, and reduce air pollution? New thought processes are needed to tap into.

- Neighbourhood- Make sure that the community meets people's needs, basic services like waste, water, energy, ability to move, and feel safe. The ability to access hospital facilities and socialize in the community.
- Safe and inclusive access to open/public spaces and enhanced green cover.
- Promoting early childhood development-oriented approaches in cities like creative parks, gardens, and outdoor play spaces.
- Adapt public space with early childhood amenities.
- Make street safe and walkable
- Improve access to early childhood services
- Converting dump yard into a tiny park
- Focus on "healthy" sleep as the goal for the society

SECTION 6: CONCLUSION

The direct and indirect climate changes place children at risk of developmental and mental health consequences, including PTSD, depression, anxiety, phobias, sleep disorder, attachment disorder, and substance abuse. These, in turn, can lead to problems with emotion regulation, cognition, learning, behaviour, language development, and academic performance. These factors combine to generate predispositions to poor mental health outcomes. Meaningful engagement improves resilience that, enhances well-being, reduces psychological and physiological adversities, and encourages positive environmental involvement.



CONTRIBUTOR LIST:

Ms. Deepika Saini, Project Officer, NIMHANS

Dr Patley Rahul, Assistant Professor, Dept of Psychiatry, NIMHANS

Mr Nithesh Kulal, Project Officer, NIMHANS

Dr Harshitha H A, Senior Resident, Dept of Psychiatry, NIMHANS

Dr Gautam Sudhakar N, Senior Resident, Dept of Psychiatry, NIMHANS

Dr Aishwarya John, Senior Resident, Dept of Psychiatry, NIMHANS

Dr. Vinay B, Specialist Grade Psychiatrist, NIMHANS

Dr Eesha Sharma, Assistant Professor, Dept of Child and Adolescent Psychiatry, NIMHANS

Dr Latha K, Assistant Professor, Department of Mental Health Education, NIMHANS

Dr K S Meena, Additional Professor and Head of the Department of Mental Health Education, NIMHANS

Dr Manjunatha N, Additional Professor, Dept of Psychiatry, NIMHANS

Dr Naveen Kumar C, Professor and Head Community Psychiatry Unit, Dept of Psychiatry, NIMHANS. Officer-In-Charge, CoE on CC-MH, NPCCHH, NCDC, MoHFW, GOI.

Dr Suresh Bada Math, Professor and Head Forensic Psychiatry Unit and Officer-In-Charge, NIMHANS Digital Academy, Dept of Psychiatry, NIMHANS

TECHNICAL EXPERT MEMBERS

Dr Vivek Benegal, Professor, Department of Psychiatry, NIMHANS, Bengaluru, Karnataka.

Dr Susanta Padhy, Additional Professor, Department of Psychiatry, AIIMS, Bhubaneswar, Odisha.

Dr Ravi Gupta, Additional Professor and Head of Department of Psychiatry, AIIMS, Rishikesh, Uttarakhand.

Dr Lenin Singh, Professor and Head of Department of Psychiatry, RIMS, Imphal, Manipur.

Dr Ritambhara, Professor, Department of Psychiatry, Surat Medical College, Gujarat.

Dr Pradeep Saha, Professor of the Department of Psychiatry and Director, Institute of Psychiatry, Kolkata, West Bengal.

Dr Yaseer, Professor and Head of Department of Psychiatry, LGB Regional Institute of Mental Health, Tezpur, Assam

Dr Anil Prabhakaran, Professor and Head of Department of Psychiatry, Thiruvananthapuram Medical College, Kerala.

Dr Poorna Chandrika, Professor of Psychiatry and Head of Department of Psychiatry, Institute of Mental Health, Chennai, Tamil Nadu.

Dr Amit Chakrabarti, Officer-in-charge Centre on Non-Communicable Diseases Indian Council of Medical Research (ICMR) Kolkata.

Dr Rinku Sharma, ADG, DGHS, MoHFW, Government of India. (Representative from NMHP)

NPCCHH team

Dr Aakash Shrivastava, Additional Director, NPCCHH

Mr Rameshwar Sorokhaibam, Deputy Director, NPCCHH

Dr Sivaprasad Gajjala, Deputy Assistant Director, NPCCHH

Mr Praveen G, Senior Consultant, Climate Change, NPCCHH

Dr Purvi Patel, Senior Consultant, Climate Change, NPCCHH

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