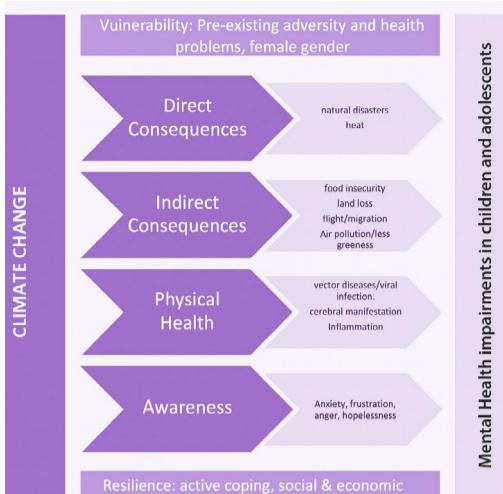


Climate Change and Youth Mental Health: A Cross-Regional Study from India and Hong Kong

Mercian Daniel,^{1,2} Sandhya Kanaka Yatirajula,¹ Tang Hiu Yu Natalie,³ Maree Hackett,^{4,5} Pallab Maulik,^{1,5,6} Shelly Lap-ah TSE^{3,7}

1. The George Institute for Global Health, India; 2. Department of Psychiatry, Kasturba Medical College, Manipal; 3. The Chinese University of Hong Kong; 4. The George Institute for Global Health, Australia; 5. Faculty of Medicine, University of New South Wales, Sydney; 6. Department of Brain Sciences, Imperial College London; 7. Fudan University/Shanghai Jiaotong University/Nanjing Medical University National Secretary of ICOH, P. R. of China.

Background



- Climate change is part of a broader pattern of human-driven environmental disruption.
- Mental health impacts, especially among young people are understudied.
- Limited evidence exists from Hong Kong, while none from India.
- This study aims to fill that gap by examining youth mental health impacts of climate change.
- Provides preliminary insights into actions to reduce psychological harm.

Objectives

Examine links between climate change and mental health (depression, anxiety) among youth aged 14-24.

- Assess mental health status and life satisfaction of participants..
- Evaluate climate change knowledge and awareness among young people.
- Explore perceptions, emotions, and psychological impacts of climate change.
- Understand levels of concern, hope, agency, and engagement related to climate action.

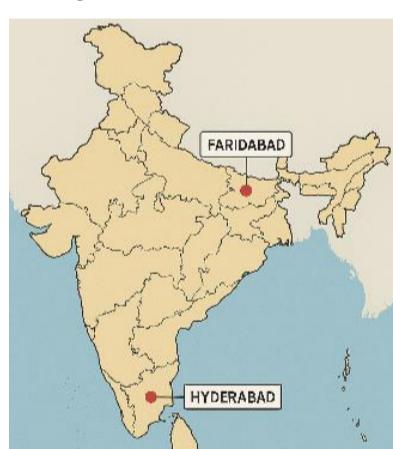
Methodology

Studies adopted an exploratory approach and applied a cross-sectional survey design

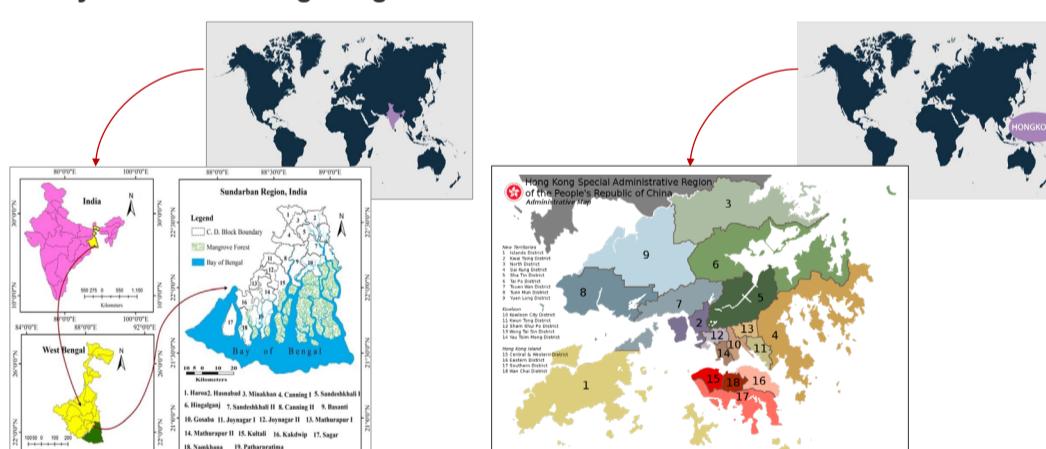
Study 1	Study 2
Adapted from a Climate Cares study at Imperial College London.	Joint research between The George Institute & CUHK
Urban slums in North and South India; indirectly affected (N= 536)	India rural cyclone-affected riverine area (N= 838) and Hong Kong urban (N= 759)
July 2021	June 2023-March 2024
SRS technique from existing study database (16-24 years)	India: SRS technique from administrative database (18-24 years); Hong Kong: CUHK mass mail and school visits (14-24 years)
Questionnaire comprised of scales and demographic details translated into local languages (Hindi, Telugu, Bengali) and adapted from the Climate Cares study	
RedCap® on tablets by trained field staff	India: RedCap® mobile version; Hong Kong: Qualtrics online and paper forms
Independent Ethics Committee, The George Institute	Ethics Committees of The George Institute and CUHK
Written consent for ≥18 years; parental consent and adolescent assent for 16–17 years	

Study sites

Study 1 sites



Study 2 India and Hong Kong sites



Analysis

Demographics

- Gender
- Age
- Education
- Occupation
- SES/ Income
- Household density

Outcomes

- Depression (PHQ-9)
- Anxiety (GAD-7)

Climate-related psychosocial factors

- Climate events experienced
- Time of experiencing climate events
- Effect climate events on family
- Knowledge of climate change
- General awareness of climate change
- Life satisfaction
- Psychological effect of environment (lack of green/ blue space, air, noise and light pollution etc.)
- Negative and positive impact on life
- Climate change related feelings (helpless, afraid, angry, hopeful etc.)
- Climate concern scale
- Impact on daily life
- Engagement in climate change activities
- Climate agency scale
- Hopes and concern for future
- Current and past mental health (diagnosis and treatment)

Outcome measures (Study 2)

Depression measured using Patient Health Questionnaire- 9 items (PHQ-9)

- Converted to binary scores: No Depression (PHQ-9 ≤4) v/s Depression (PHQ-9 ≥5)

Anxiety measured using Generalized Anxiety Disorder- 7 items (GAD-7)

- Converted to binary scores: No Anxiety (GAD-7 ≤4) v/s Anxiety (GAD-7 ≥5)

Statistical analysis (see analysis framework)

- Logistic regression to estimate association with climate-related psychosocial factors
- Control for demographic characteristics

Contact Information

Email: mdaniel@georgeinstitute.org.in | Website: www.georgeinstitute.org.in

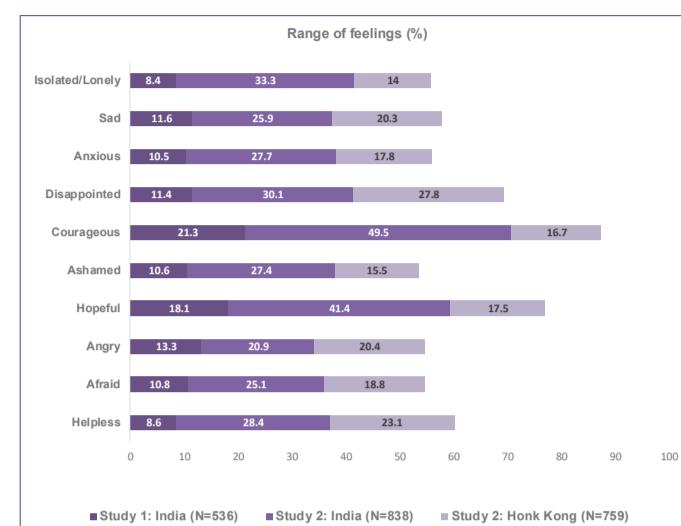
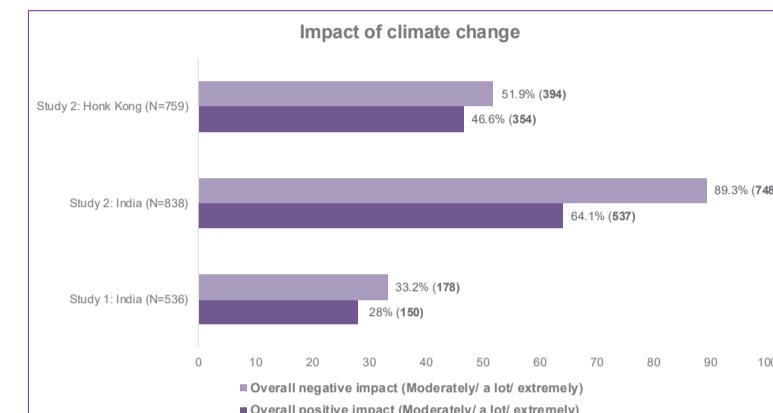
The George Institute for Global Health, India

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Results

Participants' characteristics

- About equal male-female split across studies (India: ~48-52%; Hong Kong: 52% female)
- Younger participants in Hong Kong (Mean=17 yrs.)
- Study 1: 67.7% undergraduates; Study 2 India: 86.9% up to higher secondary, Hong Kong: 66.8% up to higher secondary.



Association of depression & anxiety with climate factors (study 2: adjusted models)

Hong Kong	No Depression (PHQ-9 ≤4) n=244	Depression (PHQ-9 ≥5) n=515	aOR [95% CI]	p-value
Male [Ref. Female]	140 (38.5)	224 (61.5)	0.57 (0.42,0.78)	<0.01**
Under graduation [Ref. No schooling]	31 (22.8)	105 (77.2)	1.74 (1.12,2.70)	0.01*
Noise pollution [Ref. No effect/A little]	100 (25.9)	286 (74.1)	1.80 (1.32,2.45)	<0.01**
Lack of green/blue space [Ref. No effect/A little]	73 (25.5)	213 (74.5)	1.65 (1.19,2.29)	<0.01**
Light pollution [Ref. No effect/A little]	74 (24.7)	225 (75.3)	1.78 (1.29,2.46)	<0.01**
Knowledge			0.28 (0.09,0.90)	0.03*
Life Satisfaction			0.64 (0.59,0.71)	<0.01**
India	No Depression (PHQ-9 ≤4) n=270	Depression (PHQ-9 ≥5) n=537	aOR [95% CI]	p-value
Male [Ref. Female]	167 (38.4)	268 (61.6)	0.67 (0.48,0.92)	0.01*
Under graduation [Ref. No schooling]	43 (40.6)	63 (59.4)	0.47 (0.28,0.78)	0.00**
Formerly employed [Ref. Homemaker/ Student]	16 (25.8)	46 (74.2)	0.39 (0.26,0.58)	<0.01**
Air pollution [Ref. No effect/A little]	234 (34.6)	442 (65.4)	0.52 (0.34,0.81)	0.00**
Light pollution [Ref. No effect/A little]	132 (27.7)	344 (72.3)	2.35 (1.69,3.26)	<0.01**
Reduced drinking water [Ref. No effect/A little]	264 (33.2)	530 (66.8)	0.38 (0.14,1.02)	0.05*
Climate Agency Scale	9.65 (5.77)	8.01 (5.19)	0.95 (0.92,0.97)	0.00**

Hong Kong	No Anxiety (GAD-7 ≤4) n=361	Anxiety (GAD-7 ≥5) n=398	aOR [95% CI]	p-value
Male [Ref. Female]	202 (55.5)	162 (44.5)	0.6 (0.42,0.78)	<0.01**
Noise pollution [Ref. No effect/A little]	160 (41.5)	226 (58.5)	1.65 (1.24,2.20)	<0.01**
Lack of green/blue space [Ref. No effect/A little]	111 (38.8)	175 (61.2)	1.77 (1.31,2.38)	<0.01**
Light pollution [Ref. No effect/A little]	119 (39.8)	180 (60.2)	1.68 (1.25,2.26)	<0.01**
Hot weather [Ref. No effect/A little]	232 (44.4)	290 (55.6)	1.49 (1.10,2.03)	0.01**
Knowledge			0.27 (0.09,0.79)	0.02*
Life Satisfaction			0.66 (0.61,0.72)	<0.01**
India	No Anxiety (GAD-7 ≤4) n=256	Anxiety (GAD-7 ≥5) n=569	aOR [95% CI]	p-value
Formerly employed [Ref. Homemaker/ Student]	17 (27.4)	45 (72.6)	0.5 (0.34,0.74)	<0.01**
Light pollution [Ref. No effect/A little]	134 (28.2)	342 (71.8)	1.9 (1.37,2.62)	0.00**
General awareness	11.4 (5)	12.4 (4.27)	1.04 (1.01,1.08)	0.02*
Life Satisfaction	7.98 (1.44)	6.51 (1.89)	0.63 (0.57,0.69)	<0.00**
Climate Agency Scale	9.16 (5.33)	8.27 (5.47)	0.97 (0.94,1)	0.05*

*p<.05, **p<.001

Lessons learned

- Climate change impacts mental health between and within regions, especially those directly and disproportionately affected.
- Socio-demographic factors such as gender, education, occupation, and income are critical determinants of mental health.
- Climate-related stressors linked to environmental conditions in urban and rural settings exacerbate mental health challenges.
- Negative emotional responses related to climate change and environmental degradation significantly increase the risk of mental health problems.
- Similar to socio-demographic determinants, climate-related psychosocial factors are significant risk factors for mental health.

Policy recommendation

- Integrate mental health into climate action plans**
Recognize mental health impacts of climate change in national and regional adaptation strategies, especially for populations directly and disproportionately affected.
- Target vulnerable socio-demographic groups**
Develop tailored interventions for young people without schooling, women and girls, and low-income communities.
- Address environmental stressors in urban and rural planning**
Incorporate water security, pollution control, and livelihood generation measures into climate resilience programs to reduce mental health risks linked to environmental conditions.
- Include psychosocial support in climate policies**
Provide community-based mental health services and counseling to manage negative emotional responses and climate-related distress.
- Promote climate literacy, agency and engagement opportunities**
Co-create and implement education and awareness campaigns to strengthen climate knowledge and psychosocial resilience, reducing vulnerability to mental health problems.