

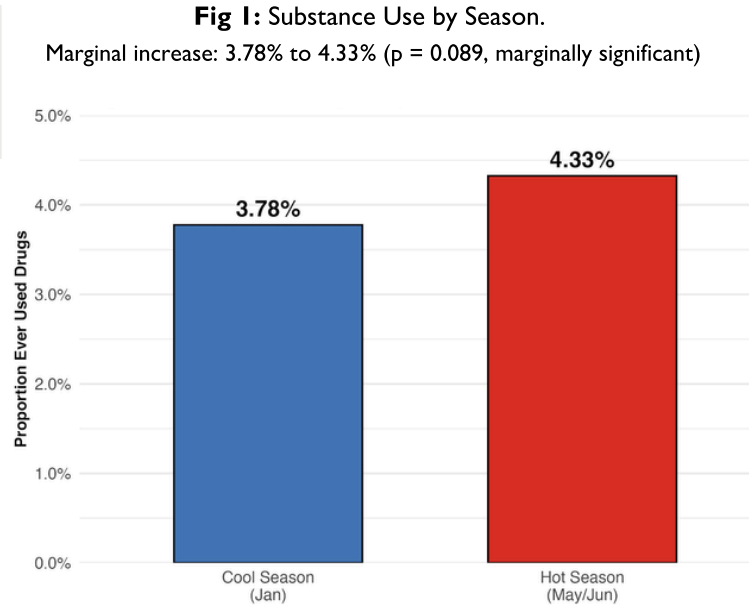
An Analysis of Heat Exposure and Substance Use Patterns in Bangladesh

Adisri Swain, Jasnoor Kaur Anand, Mehria Sadaat Khan, Nicholas Mensah

This policy brief draws on a study for the World Bank Group’s Health, Nutrition, and Population Global Practice that examines heat exposure and substance use (recreational drug use) in Bangladesh, based on a two-round household panel survey conducted in winter (January 2024) and summer (May-June 2024). In Bangladesh, moving from the cool to the hot season is associated with a 35% increase in the odds of substance use, a pattern that falls hardest on women, rural residents, and those outside the labour force - groups that are already among Bangladesh's most vulnerable. Our findings point to targeted, climate-resilient public health interventions in Bangladesh.

Substance Use in Bangladesh Rises with Temperature

Figure 1 shows a 14.6% relative increase in substance use prevalence from the cool to the hot season. With substance use already affecting an estimated 2.5 million individuals in Bangladesh, even modest seasonal increases in prevalence represent a pressing public health concern. These seasonal patterns align with the highest heat exposure in our study, indicating that rising temperatures may be an underexplored driver of substance use risk in Bangladesh.



Heat Exposure is Associated with Higher Odds of Substance Use

Figure 2 shows that heat exposure is associated with 35% higher odds of substance use in the hot season (AOR = 1.348). A more detailed temperature bins model finds that moderate heat (30-35°C) is associated with approximately a 28-29% increase in odds per additional day. Extreme heat (>35°C) shows a negative coefficient, possibly reflecting behavioural adaptation such as reduced outdoor activity, rather than a true protective effect.

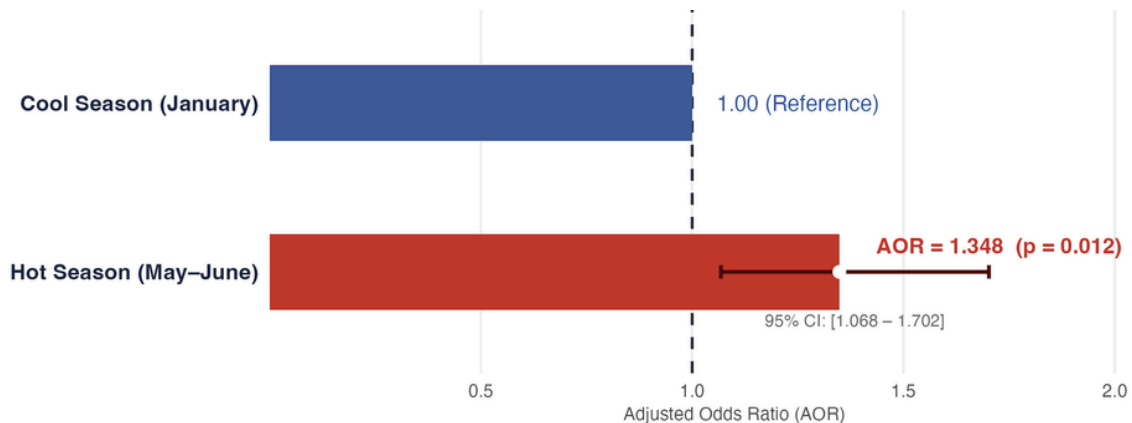


Fig 2: Seasonal Odds Ratio for Substance Use

Hot season associated with 35% higher odds of substance use relative to cool season

Vulnerable Groups Bear a Disproportionate Burden

- **Not in the labor force (homemakers, students, retirees):** Each additional hot day raises their likelihood of substance use by 12%, a stronger effect than any other group.
- **Rural residents:** Each additional hot day raises the likelihood by 3.6% for rural residents, despite cities being physically hotter due to heat island effects.
- **Women:** Each additional hot day raises the likelihood by 16% for women, while men show no significant effect.

Policy Implications

- Integrate substance use risk into Bangladesh's national heat action plan, with targeted protocols for rural upazilas (administrative districts) where the heat effect is strongest.
- Heat raises substance use risk partly by disrupting sleep quality. Government treatment centres and NGO health programmes should add sleep screening to their protocols during April-September.
- The Department of Narcotics Control currently tracks seizures, not health trends. Bangladesh should require seasonal disaggregation of the Department of Narcotics Control's annual drug use data to enable pre-summer prevention planning at no additional cost.
- Add a substance use screen to community health worker visit protocols in the summer to directly reach the three highest-risk groups identified in this study.

Methodology

- Population-weighted logistic regression estimating the association between heat exposure (measured as cumulative days within temperature bins of 30-32°C, 32-35°C, and >35°C in the 15 days preceding each interview) and substance use, with results reported as Adjusted Odds Ratios (AORs) and standard errors clustered at the Primary Sampling Unit (PSU) level.
- Data from a two-round nationally representative household panel survey (January and May-June 2024) across 180 PSUs, linked to temperature data from 47 Bangladesh Meteorological Department weather stations.

Limitations

- Under-reporting of substance use: only 4.05% self-reported prevalence, likely underestimating the true effect.
- Cannot fully distinguish heat from seasonal confounding factors such as agricultural cycles, labor patterns, and substance availability. Results should be interpreted as conditional associations rather than definitive causal estimates.