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IIT Kharagpur develops climate-informed dengue risk assessment framework

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CliMed should be understood as a research and decision-support framework



Researchers at the Indian Institute of Technology (IIT) Kharagpur have developed **CliMed**, a climate-informed and spatially explicit modelling framework for dengue risk assessment over India. The model brings together daily climate information, land-use characteristics, human population data, settlement context and mosquito-species suitability to generate interpretable risk signals for Aedes-borne dengue transmission.

Dengue risk is shaped by several interacting conditions. Temperature influences mosquito biting, development, survival and the time required for the virus to become transmissible inside the mosquito. Rainfall can create breeding opportunities, while very heavy rainfall may also disturb immature stages. Humidity affects mosquito activity and survival. Land-use, settlement pattern and population distribution determine whether suitable mosquito conditions are likely to translate into meaningful human exposure. CliMed has been designed to read these factors together, rather than treating dengue risk as a simple statistical association between weather and reported cases.

CliMed is intended to support preparedness by adding an environmental and biological layer to dengue risk interpretation. Reported case counts remain essential, but they may be delayed, unevenly recorded or influenced by testing and reporting practices. CliMed therefore provides a complementary view: it identifies days and locations where climate, vector ecology and exposure conditions may be becoming more favourable for transmission.

CliMed should be understood as a research and decision-support framework. It does not diagnose dengue, replace surveillance data or predict confirmed clinical cases by itself. Its outputs are interpretable risk signals that should be compared with field surveillance, local vector information, public-health records and expert review before operational decisions are made.

The immediate goal is to strengthen dialogue between climate scientists, epidemiologists, public-health officials and local administrations by providing transparent maps and indicators that explain why a place or season may deserve closer attention.