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INTERNATIONAL RESEARCH INITIATIVE ON ADAPTATION ON CLIMATE CHANGE – COASTAL COMMUNITIES AT RISK (IRIACC-CCAR): SYSTEMS DYNAMICS MODELLING OF FLOOD-RELATED LEPTOSPIROSIS IN THE PHILIPPINE NATIONAL CAPITAL REGION

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Background A Five-year project funded as an International Research Initiative on Adaptation to Climate Change aiming to develop knowledge base and enhance capacities of coastal megacities to adapt with risks posed by climate change.

Objectives Use systems dynamics modelling as a primary tool for analysis of resilience patterns of coastal cities.

Methods The scope of the study was NCR during the two flooding events in 2009–2011. The outcome measure was leptospirosis mortality. Data collection was done through a workshop integrating systems dynamic models from WHO and Australian National University. 22 participants attended the workshop from national and local health offices. They created three causal loop diagrams and completed worksheets describing the different factors affecting mortality during flood events. The median for each effect strength of factors were used. The Ventana Simulation Program (Vensim) was used to develop the models.

Result The final causal loop diagram has 37 factors with 56 causal interrelationships. Common factors between diagrams were: household's knowledge of leptospirosis, households below poverty line and households with unsanitary garbage disposal. Common outflow from primary outcome measure was the number of policies implemented. Environmental factors has the biggest effect on the system (3/6 of strongest effects). The two factors with broadest influence in the system were policies implemented and percent of utilized funds for leptospirosis.

Conclusion Public policy plays a large role in the system during flood events. The primary outflow effect of mortality is public policy and people's knowledge of the disease. This strengthens the notion that response to disasters are learned after the disaster has already happened. System dynamic modelling provides policymakers with more dynamic perspectives on health systems. Dynamic computer simulations can be done to extrapolate data and help simulate future flooding events.