Regime shifts in health and disease: Exploring transitions for improving human health and well-being

Marta Berbes-Blazquez*1,2 and Jordan Oestreicher*3

1York University, Faculty of Environmental Studies – Faculty of Environmental Studies HNES 137, York University 4700 Keele Street Toronto, Ontario M3J 1P3, Canada
2Instituto Regional de Estudios en Sustancias Toxicas (IRET) – Costa Rica
3Université du Québec à Montréal, Centre interdisciplinaire de recherche sur la biologie, la santé, la société et l’environnement (Cinbiose) – CINBIOSE Université du Québec à Montréal Case postale 8888, Succursale Centre-ville Montréal (Québec) H3C 3P8 Canada, Canada

Abstract

The notion of regime shifts in resilience thinking evolved from the observation that ecosystems occasionally experience rapid, abrupt changes to an alternative stable stage, that are often triggered by an external event and that involve the crossing of a critical threshold. Many of these regimes shifts have been documented in the Regime Shifts DataBase maintained by the Stockholm Resilience Centre (www.regimeshifts.org). Given the pervasiveness of regime shifts in ecological systems, and the fact that these arise as a consequence of their complexity, there is good reason to think that complex social-ecological systems might also experience regime shifts. However, while the concept of regime shifts has found use in the study of complex social issues such as poverty traps, there are but few documented examples of regime shifts pertinent to specific human health issues. We propose that the idea of regime shifts can be extended to the understanding of human health, particularly from the perspective of ecosystem approaches to health (or ecohealth) whereby health and wellness are considered the product of social and ecological interactions. We would like to investigate how the concept of regime shifts may prove useful in the understanding of rapid change and crises in human health by highlighting drivers of disease and exploring pathways to prevention.

Our proposed session is exploratory in character and we combine some ecohealth case studies with insights from resilience thinking to answer the following questions:

- What new insights (if any) do we gain from applying the idea of regime shifts to human health issues in developing settings, particularly around vector-borne diseases, re-emerging infectious diseases and cases of environmental pollution?
- Could these insights be translated into actions for improved health outcomes, for instance, by offering guidance that would enhance ecosystem management or result in better-tailored health interventions?
- Can we distinguish between two true alternative states? If so, how can they be described (e.g. based on ecological processes, based on social processes)?

*Speaker
Can the mechanism(s) for switching back and forth between two states be identified? Do these mechanisms involve interactions between social and ecological variables? Between variables at different scales?

Do the ecological-health systems studied exhibit thresholds? If so, are these thresholds only evident after they are crossed? Can indicators be developed that would allow for practical, upstream health interventions?

The session will consist of 3-4 short presentations (5 min.) of case studies that have examined a transition in human health and well-being, or that present insights from resilience theory applicable to regime shifts in health. The majority of the time will be allocated for open group discussion. We expect that this session will generate new ideas regarding the application of regime shifts to the study of human health and begin building a network of researchers with interests in further exploring the related possibilities, through future publications or other venues such as working groups, etc.

**Keywords:** regime shift, health, transformation, desirable states, threshold, trap, well, being, land management