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HYBRID EVENT

NITheCS COLLOQUIUM:

Tsetse, trypanosomiasis and climate change:

Lessons from Field Data collected in the Zambezi Valley of Zimbabwe

Prof John Hargrove (South African Centre for Epidemiological Modelling and Analysis)

Attend in person at the Neelsie Cinema* or online

*1st Floor The Neelsie Langenhoven Student Centre, Stellenbosch University

Monday, 13 March 2023 | 16h00 – 17h00 SAST

---- Cheese and wine will be served after the event ----

ABSTRACT

Insect vectors attract small fractions of the funding spent on studying and controlling the diseases those vectors transmit. Accordingly, models of vector-borne diseases are seldom related to field estimates of vector numbers, since such estimates seldom exist. An exception is provided by the work carried out since 1960 at Rekomitjie Research Station, Zambezi Valley, Zimbabwe. Biological and meteorological data, generated throughout this period, provide a platform for studying the effects of climate change on the population dynamics of two species of tsetse. Work at Rekomitjie has highlighted the central importance of temperature for tsetse population dynamics. Rates of abortion, pupal production, fat metabolism and mortality in adults and pupae, all increase significantly with increasing temperature. Conversely, sustained temperatures below 16°C kill all pupae. Tsetse are thus constrained in where they can survive – particularly because their very low birth rate means that death rates must also be minimal. The reality of this problem for the flies has become evident with increases in temperature at Rekomitjie over the past 30 years – and particularly in the last decade. High temperatures in the mid-1990s were associated with an order of magnitude decline in fly numbers, which recovered only partially by 2010 – when a series of extremely hot years led, temporarily, to an almost complete disappearance of one species of tsetse. Preliminary modelling provides a good description of recent changes in populations of this species. We now aim to model population changes over the entire 60-year life of the Station as a function over various meteorological and biological drivers. The results of our modelling will be applied to other species of tsetse in other localities. More broadly, we will consider the implications of the modelling for the study and control of other insect vectors of diseases of humans and livestock.

BIOGRAPHY

Schooled in Zimbabwe, I completed an honours degree in zoology at Oxford University and a PhD at Imperial College, London, on the physiology of flight in tsetse. I then embarked on a 50-year career studying these vectors of the trypanosomiases. I continue to work with colleagues on the extensive data, relating to tsetse biology, produced over the past 50 years at Rekomitjie Research Station in the Zambezi Valley of Zimbabwe.
Between 2000 and 2010 I also intercalated 10 years analysing and modelling data on HIV, focusing latterly on using biomarkers to estimate HIV incidence rates. I worked in Zimbabwe until 2006 when I was appointed inaugural Director of the South African Centre for Epidemiological Modelling and Analysis (SACEMA).

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