

THE RELEVANCE OF ZIKA EPIDEMIOLOGICAL MODELLING STUDIES IN INFORMING PUBLIC HEALTH POLICIES DURING THE FIRST WAVE OF THE EPIDEMIC

Bertrand Sudre¹, Wim Van Bortel¹, Herve Zeller², Joacim Rocklöv³

¹Surveillance and Response Support Unit, European Centre for Disease Prevention and Control, Stockholm, Sweden, ²Office Chief Scientist, European Centre for Disease Prevention and Control, Stockholm, Sweden, ³Epidemiology and Global Health Unit, Umeå University, Umeå, Sweden

Infectious disease modelling is of paramount importance in modern epidemiology. While modelling studies informing outbreak response and control policy was not initially defined as a priority when declaring the public health emergency situation (PHEIC) of Zika, the research community has attempted to bridge existing knowledge gaps. To encourage rapid dissemination, global health bodies and WHO supported early data sharing, pre-print initiative and fast-track reviews in February 2016. Almost one year after the PHEIC declaration in February 2016, we reviewed the relevance of the scientific studies in informing risk assessments and strategies for public health policy.

We systematically searched scientific and open databases for peer- and non-peer-reviewed scientific works from November 2015 onwards. We searched for studies assessing the Zika outbreak covering epidemiology and risk assessment, disease dynamics, mathematical modelling, ecological niche modelling, global mobility, and spatial and temporal analyses. After abstract and full text review, we finally selected 116 manuscripts between November 2015 and January 2017. During the emergency, publication of Zika papers peaked in June 2016, demonstrating the quick involvement of the scientific community. The first papers were early risk assessments, local epidemiological observations and studies estimating key parameters of disease dynamics. More studies became available in May–July 2016, including estimations of the basic reproduction number, and assessment of spread of Zika outside America. More recently, studies have assessed the contribution of sexual transmission to the spread of the virus. Around one third of selected studies were identified as having high policy relevance; however, comprehensive studies of Zika virus endemicity and the impact of vector control measures were lacking.

During the PHEIC, we saw that the research community has the capacity to support risk assessment and public health. At first, the studies of Zika were descriptive and irregular, but with time they evolved to more analytical and comprehensive scientific contributions and risk assessments. The latest stage, studies started to address uncertainties, complexities and future prospects of transmission. We acknowledge the solution of fast-track publication models to improve timely access of research findings and encourage the publishers to use such models during emergency situations. However, the significant proportion of non-peer reviewed publications, lacking robust scientific peer-assessment, may remain a challenge to immediate use for public health. To support public health decision making and policies and based on lessons learned from this PHEIC, we suggest a priority list of relevant studies in epidemiology and infectious disease modelling in future emergency situations

associated to a vector-borne disease and to be considered in the context of the current Zika virus epidemic.