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First Scientific Symposium Health and Climate Change

Istituto Superiore di Sanità
Rome, December 3-5, 2018

ABSTRACT BOOK

Edited by
W. Ricciardi, S. Marcheggiani, C. Puccinelli,
M. Carere, T. Sofia, F. Giuliano, E. Dogliotti and L. Mancini



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Edited by

Walter Ricciardi (a), Stefania Marcheggiani (c),
Camilla Puccinelli (c), Mario Carere (c), Tonino Sofia (b),
Fabiola Giuliano (b), Eugenia Dogliotti (c) and Laura Mancini(c)

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Climate changes affect social and environmental health determinants such as clean air, ecosystems health, safe drinking water and sufficient food. Globally, people at greatest risk of adverse health effects associated with climate change include the children, the elderly and vulnerable groups. Socio-economically disadvantaged groups and areas where infrastructure and/or social services are not efficient will fail in adaptation to climate change and related health hazards. Temperature-related death and illness, extreme events, polluted or stressed ecosystems represent relevant issues raising concern for both health and economic consequences. The aim of the Symposium is to promote an intersectoral and multidisciplinary approach to estimate, and to prevent, climate change-related events as well as to prepare the authorities to put in place measures to reduce adverse health effects.

Keywords: Climate changes, Human health, Adaptation, Sustainability, Scenarios, Advanced technologies, Innovative tools, Resilience, Management policy, Children's health, Urban cities, Ecosystems, Green areas, Extreme events

Istituto Superiore di Sanità

Primo Simposium Scientifico: Salute e Cambiamenti Climatici. Istituto Superiore di Sanità. Roma, 3-5 dicembre 2018. Riassunti.

A cura di Walter Ricciardi, Stefania Marcheggiani, Camilla Puccinelli, Mario Carere, Tonino Sofia, Fabiola Giuliano, Eugenia Dogliotti e Laura Mancini
2018, xxix, 268 p. ISTISAN Congressi 18/C5 (in inglese)

I cambiamenti climatici influenzano i determinanti della salute come la qualità dell'aria, la salute degli ecosistemi, la sicurezza idropotabile e la disponibilità di cibo. A livello globale, le persone a maggiore rischio di effetti avversi sulla salute associati ad i cambiamenti climatici includono i bambini, gli anziani ed i gruppi vulnerabili. Aree dove i servizi sociali e le infrastrutture sono poco efficienti e le comunità che hanno svantaggi economici non posseggono misure di adattamento adeguate per fronteggiare i cambiamenti climatici ed i loro effetti. Patologie e decessi causati dall'aumento della temperatura, eventi estremi, ecosistemi alterati e/o inquinati rappresentano dei problemi rilevanti per le conseguenze negative sanitarie ed economiche. L'obiettivo del simposio è quello di promuovere un approccio multidisciplinare ed intersettoriale per stimare e prevenire gli eventi connessi ai cambiamenti climatici e di preparare le autorità politiche a predisporre delle misure per ridurre gli effetti avversi sulla salute.

Parole chiave: Cambiamenti climatici, Salute umana, Adattamento, Sostenibilità, Tecnologie avanzate, Metodologie innovative, Resilienza, Gestione, Salute dei bambini, Città, Ecosistemi, Aree verdi, Eventi estremi

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A MODELLING ANALYSIS OF WEST NILE VIRUS TRANSMISSION AND HUMAN INFECTION RISK IN VENETO (ITALY)

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West Nile Virus (WNV) is a flavivirus of emerging public health relevance in Europe, which is maintained in enzootic cycles between avian reservoir hosts and mosquitoes. Humans are dead-end hosts in which infection can induce symptoms from mild flu-like fever to severe neurological syndromes such as meningitis, encephalitis, and acute flaccid paralysis. An intensified and continuous WNV spread across Northern Italy has been observed since 2008, which caused more than a hundred reported human infections up until 2016. Veneto is one of the Italian regions where WNV is considered endemic, and the greatest circulation was observed during 2013 and 2016.

By using entomological data collected across the region in those years, we calibrated a mathematical model through a Bayesian approach that simulates the WNV infection in an avian population with seasonal demography, taking also into account the effect of temperature on the virus dynamics. We considered two alternative routes of life cycle re-activation of the virus at the beginning of each vector breeding season: in one the virus is introduced by infected birds, in the other by diapausing mosquitoes which were infected in the previous year. We estimated biting rate and host-vector ratio by fitting model prediction to the observed WNV infection in the vector. Afterwards, we computed seasonal risk curves, indicating the likelihood for a human to be infected during the year, and quantified how they translate into reported symptomatic cases, also allowing for a shift in vector feeding preference according to actual observation.

According to our results, WNV is likely to be re-activated each year via already infected mosquitoes, thus it seems probable that the virus survives through winter in the area and it is not reintroduced every season from other regions. The highest probability of human infection is expected to occur in August, consistently with observations.

Our findings might provide new insights on the ecology of WNV in Southern Europe, in particular regarding its endemism and seasonality. Estimated human infection risk during the season can be of particular interest for public health authorities, helping them to design efficient surveillance and prevention strategies.