What is the role of pig production in Japanese Encephalitis virus ecology?

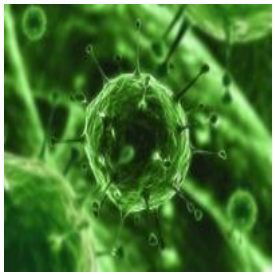
What is the role of pig production in Japanese Encephalitis virus ecology?

A recent publication reviews the drivers of the Japanese Encephalitis virus ecology, such as husbandry of domestic pigs, climate, landscape, and viral genetics

The Japanese encephalitis virus (JEV), an arthropod-born
Flavivirus
, is the major cause of viral encephalitis, responsible for 10,000?15,000 deaths each year, yet is a neglected tropical disease. Since the JEV distribution area has been large and continuously extending toward new Asian and Australasian regions, it is considered an emerging and reemerging pathogen. Despite large effective immunization campaigns, Japanese encephalitis remains a disease of global health concern. JEV zoonotic transmission cycles may be either wild or domestic: the first involves wading birds as wild amplifying hosts; the second involves pigs as the main domestic amplifying hosts.
Culex
 mosquito species, especially
Cx. tritaeniorhynchus
, are the main competent vectors. Although five JEV genotypes circulate, neither clear-cut genotype-phenotype relationship nor clear variations in genotype fitness to hosts or vectors have been identified. Instead, the molecular epidemiology appears highly dependent on vectors, hosts' biology, and on a set of environmental factors. At global scale, climate, land cover, and land use, otherwise strongly dependent on human activities, affect the abundance of JEV vectors, and of wild and domestic hosts. Chiefly, the increase of rice-cultivated surface, intensively used by wading birds, and of pig production in Asia has provided a high availability of resources to mosquito vectors, enhancing the JEV maintenance, amplification, and transmission. At fine scale, the characteristics (density, size, spatial arrangement) of three landscape elements (paddy fields, pig farms, human habitations) facilitate or impede movement of vectors, then determine how the JEV interacts with hosts and vectors and ultimately the infection risk to humans. If the JEV is introduced in a favorable landscape, either by live infected animals or by vectors, then the virus can emerge and become a major threat for human health. Multidisciplinary research is essential to shed light on the biological mechanisms involved in the emergence, spread, reemergence, and genotypic changes of JEV.

[Article Source]

Le Flohic G, Porphyre V, Barbazan P, Gonzalez J-P (2013) Review of Climate, Landscape, and Viral Genetics in Japanese Encephalitis Virus Ecology. PLoS Negl Trop Dis 7(9): e2208. doi:10.1371/journal.pntd.0002208



Oui