

The role of rice paddy owners, transporters of ducks and hatcheries in influencing the spread of Highly Pathogenic Avian Influenza (HPAI) virus in Indonesia

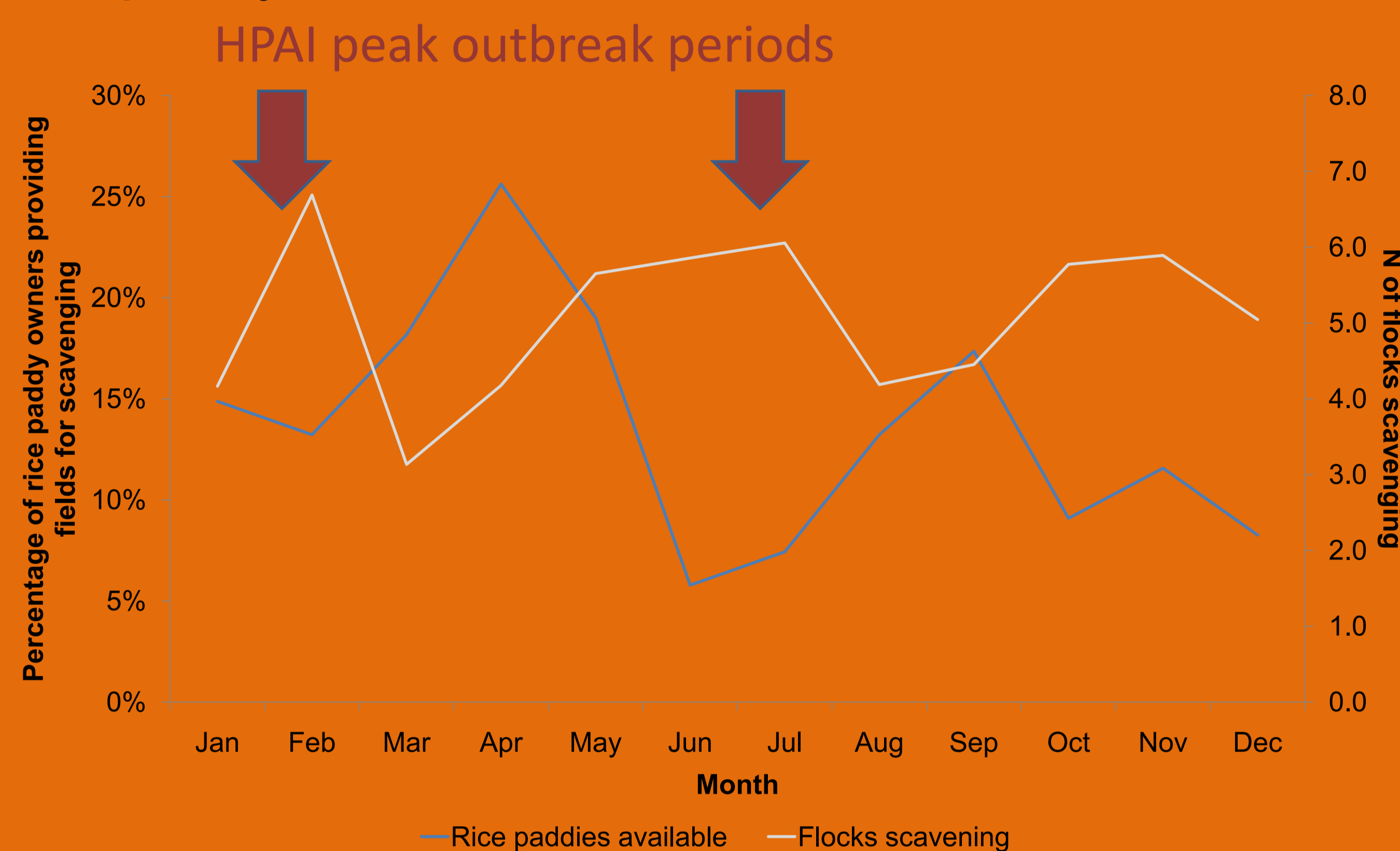
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Background: Previous investigation focussed on identifying hazards associated with the management of duck flocks, that might increase the risk of HPAI spread. However, various other professions are associated with the duck production system, directly or indirectly. These include transporters of moving duck flocks, rice paddy owners who offer their rice fields for scavenging, and hatcheries which provide ducklings and/or purchase eggs from duck flocks. Their management practices might be related to external, biosecurity hazards of HPAI spread.

Methods: Rice paddy owners (N=121), transporters of moving duck flocks (N=30) and hatchery owners (N=75) were interviewed in 2009 in central Java, Indonesia, using cross-sectional questionnaire surveys.

Results:

Rice paddy owners



The majority of rice paddy farmers provided their paddies for scavenging in the period from March to May with a peak in April and then again August to October with a peak in September. The number of flocks scavenging per paddy per month varied between 3-4 flocks in the peak scavenging months and 5-6 flocks in the months when less paddies are available. Usually farmers did not receive any payment from the duck owners. The most important benefit for paddy farmers was the control of snails (69%), followed by duck faeces providing fertiliser (43%). The majority of duck owners disposed carcasses of ducks that died during scavenging by burial (50%), but many owners just threw them into nearby rivers (38%).

Transporters of duck flocks

About 90% of transporters combined flocks from different farms into a one load with a median number of 14 duck farms visited to obtain one load. 67% of transporters indicated that ducks had contact with each other during transport. A median number of 16 journeys were conducted per year to scavenging locations (median distance travelled 90km). About 65% of transporters also transported duck feed, 14% chickens, 25% other birds, 25% other animals than birds and 39% eggs together with ducks on the same load. The most common deaths during transport were from physical injuries, followed by dehydration or diseases. About 57% of transporters threw ducks that died during transport into rivers or paddies. All transporters removed faeces from the vehicles, but only 13% used disinfectant on the vehicle surfaces.



Hatcheries

About 49% of hatcheries produced their own eggs, 52% purchased eggs from stationary and 25% from moving duck flocks and 18% obtained eggs from professional egg traders. The majority of hatcheries used modern egg incubators (58%), but the use of traditional methods (e.g. oil lamps) (34%) or muscovy ducks (18%) was also common. In close distance to 56% hatcheries, chickens or ducks were kept, most of them free-ranging. Although duckling pens were cleaned in 33% of hatcheries, disinfection was only conducted in 12% of hatcheries.

Discussion: HPAI can only be successfully controlled when the complexity of duck production, with all its facets, is understood. We provided new insights into HPAI epidemiology by identifying potential HPAI hazards related to activities not conducted by duck farmers, but by their associates. This can provide the basis for recommendations for effective HPAI prevention, before the virus is entering susceptible duck flock populations.