

The Move of a Crocodile Farm from Israel to Cyprus: Public Health Concerns for the spread of West Nile Virus infections in Cyprus

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Introduction

Currently, it is being explored whether to move an existing number of crocodiles from a commercial farm in Israel to the community of Dasaki Achnas, in Cyprus. The Community Council gave its preliminary approval following a trip to France to visit a zoological park (1). Reports in the Israeli press (2) indicate that there are 1000 crocodiles to be relocated and already at the site there are 1000 eggs “and that number could swell to 3,500”. The same article mentions that the farm opened in 1987 “and was ordered shut by the local council after 70 of the creatures escaped in 2012”.

Beyond the safety issue, and the environmental impact, it is important for the Cypriot authorities to examine potential public health ramifications of this move. Infections of crocodiles and alligators with the West Nile Virus (WNV) have been documented in scientific literature, and in 2003 a study was conducted in Israel on a commercial farm which reported “a high rate of infection with WNV in crocodiles in Israel” (3).

West Nile Virus

West Nile Virus (WNV) belongs to the family of Flaviviridae, which encompasses more than 70 different viruses. Among these are several arthropod-borne viruses of clinical importance such as dengue virus, yellow fever virus, tick-borne encephalitis virus, Japanese encephalitis virus and zika virus, as well as non-vector borne infections such as hepatitis C virus. Flaviviruses in general cause severe health problems in nearly all parts of the world.

West Nile virus is transmitted by mosquitoes of the genus *Culex* which is also found in Cyprus (4,5). In about 75% of those infected few or no symptoms occur, whilst about 20% of the remainder develop fever, headache, vomiting, or a rash. In less than 1% of people, encephalitis or meningitis occurs, with associated neck stiffness, confusion, or seizures, and recovery from the infection can take weeks to months. There is a 10% fatality rate in the group of patients with nervous system involvement (6). There is no human vaccine that can be used for prophylaxis.

Typically female mosquitoes become infected when they feed on infected birds. Outbreaks of WNV infection have occurred in Europe, Africa, Asia, Australia, and North America. In the United States thousands of cases occur annually mostly in August and September. Horses also act as a reservoir of the virus, whilst recent studies aiming to detect antibodies against WNV in the blood of other animal species including reptiles, have established that infection is possible of farmed Nile crocodiles in Israel, farmed crocodiles in Mexico, wild alligators in Florida and free-range American alligators in Louisiana. In the latter case, the virus was found to be associated with disease and mortality in farmed alligators not only in Louisiana but also in Georgia and Florida (7). These animals are an additional reservoir of the virus.

A recent report indicates that “in the past decade, outbreaks of infection with West Nile Virus in human populations and in farmed alligators in the USA has seen the research emphasis placed on the issue of reptiles, particularly crocodiles and alligators, being susceptible to, and reservoirs for, this serious zoonotic disease”(7).

In the last decade, WNV seems to have made inroads into Southern and Eastern Europe, including countries such as Italy, Greece, Bulgaria and Romania, as well as Turkey and Israel (8). In Israel, recent sero-surveys have indicated increasing prevalence of antibodies against the virus (9). Similarly in Greece, a large outbreak in 2010 followed by a second one in 2011 caused more than 250 neuroinvasive disease cases with 15% fatality rate (10,11). The West Nile Virus is endemic in Israel, affecting yearly 40-160 (12) individuals, with the largest outbreak occurring from August 1 to October 31, 2000, with 417 serologically confirmed cases and 35 fatalities.

In Cyprus there has been only one diagnosed case which was imported from Greece (13).

Conclusion:

Taken together, the proposed import to Cyprus of crocodiles from a farm in Israel that has been implicated in having seropositive animals (2, 14) may pose a real risk to the public in view of the presence in Cyprus of mosquitoes of the same genus which are known to be involved in the transmission of the virus. Considering that the virus has been showing signs of increased virulence in recent outbreaks, this proposition may not be desirable.

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