Evaluation of PPR spread through trade of live small ruminants

Awada L., Tizzani P., Potocnik M., Mapitse N., Caceres P.
World Animal Health Information and Analysis Department
World Organisation for Animal Health | information.dept@oie.int

INTRODUCTION

Since 2007, 14 countries have notified to the OIE the first occurrence of peste des petits ruminants (PPR) on their territory suggesting increasing disease spread. Animal movments are know to be one of the main routes for PPR spread at international level. The objectives of this poster are therefore to 1) describe the recent evolution of the international legal trade of live small ruminants, as a potential route for disease spread and 2) evaluate the role of legal vs. informal international trade of small ruminants in PPR spread over the past ten years.

MATERIAL AND METHODS

International legal trade data was extracted from the UN COMTRADE database. A trade network was built using social network analysis techniques. Its evolution from 2007 to 2015 (last year with complete information) was described in terms of monetary value and network density (i.e. ratio of observed ties to possible ties in the trade network). Statistically significant trends were identified using Spearman's rank correlation test.
Then, for 10 PPR events reported to the OIE as first occurrences in countries since 2007, genetic links with previously existing viruses in other countries were identified. This work relied on bibliographical research of studies reporting viral sequences. The links between, the legal trade routes and virus sequences were then compared.

RESULTS

Legal international trade significantly increased from 2007 to 2015, both in terms of monetary value (S = 16, rho= 0.9, p-value < 0.05) and network density (S = 34, rho= 0.7, p-value < 0.05) (Figure 1). In the second part of the analysis, only 1/10 disease events analysed could be explained by legal trade, according to assumptions derived from genetic sequencing (Figure 2).

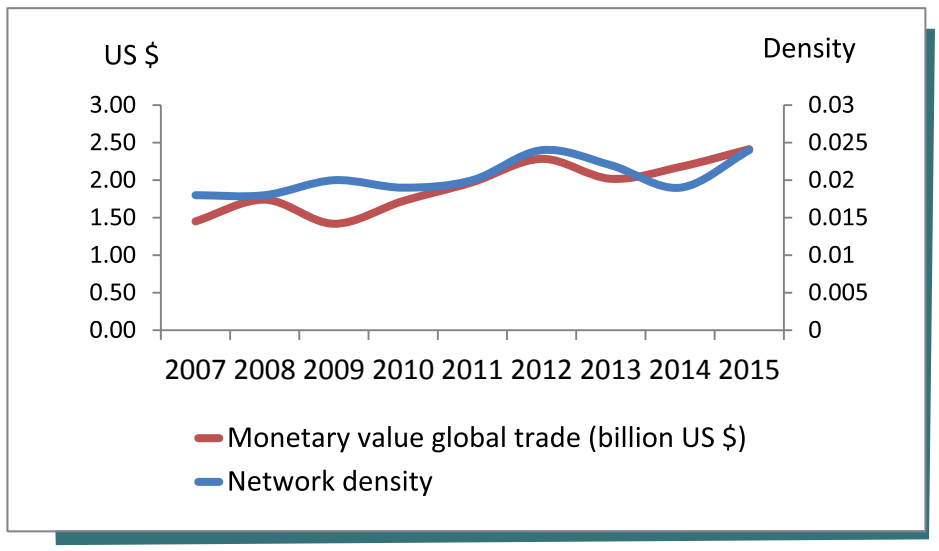

Figure 1. Trend of legal international small ruminants trade from 2007 to 2015

DISCUSSION & CONCLUSIONS

Despite increasing legal trade in live small ruminants over the last 10 years, there is no evidence this is linked to spread of PPR. The recent international spread of PPR is more likely to be due to informal and non-regulated animal movements. Indeed, illegal movements of live animals were reported through immediate notifications and follow-up reports as the source of four transboundary PPR introductions during the period of analysis.

These elements should be taken into consideration by Member Countries in the context of the Global Strategy for the eradication of PPR by 2030 adopted in March 2015. In addition, this analysis shows the importance of genetic information for better understanding disease spread. Therefore, as planned in the OIE Sixth Strategic Plan, genetic information will be linked to epidemiological information in the next version of WAHIS. Member Countries are encouraged to try to perform systematic virus sequencing during exceptional events, with the support of OIE Reference Laboratories.

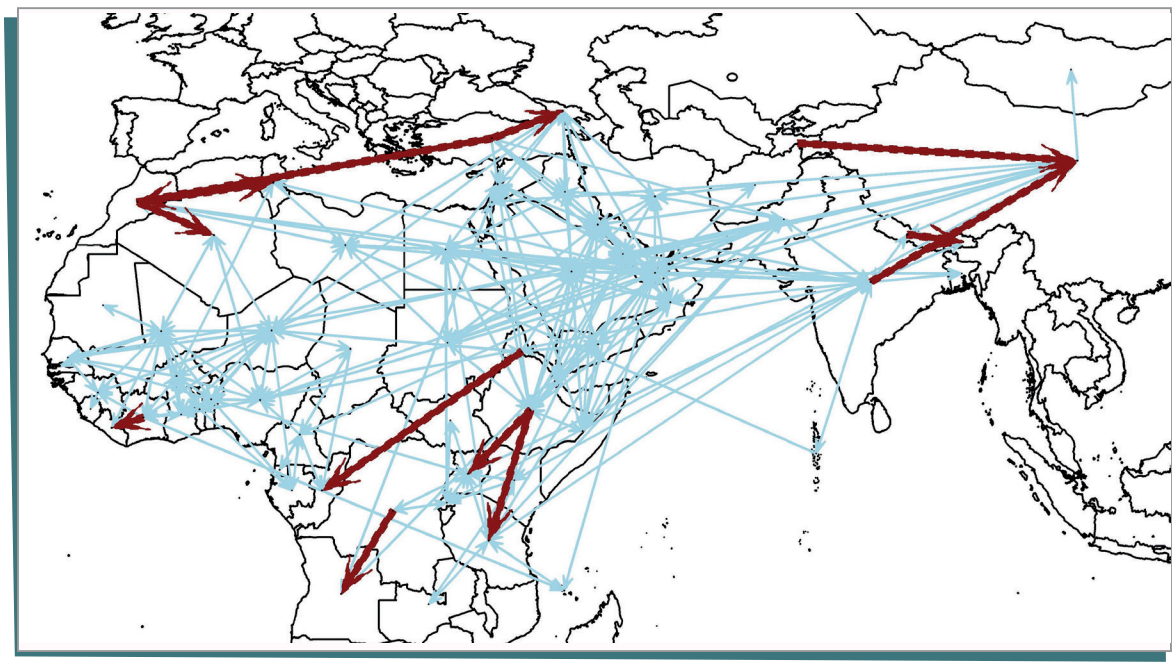

Figure 2. Compiled international legal trade movements of live small ruminants between PPR affected countries since 2007 (blue arrows) and potential PPR spread routes as estimated from genetic sequencing analysis (red arrows) during the same period

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References : Refer to Report « CURRENT ANIMAL HEALTH SITUATION WORLDWIDE: ANALYSIS OF EVENTS AND TRENDS » presented during OIE General Session – May 2017