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SDEC Partners Research Update

Increase on the risk for ASF virus introduction into the US by air passengers

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Background

There has been an unprecedented spread of African swine fever (ASF) through Western Europe, China, Mongolia, and Vietnam in 2018 and 2019, which has led to concerns that the disease may continue to spread into disease-free regions, such as the US.

A recently published study ([Jurado et al, 2018](#)) estimated the risk of introduction of African Swine Fever virus (ASFv) into the US through prohibited swine products carried by air passengers. Although that study has been published recently, the data that were initially analyzed corresponded to 2016-2017, therefore the recent changes in ASFV expansion has resulted in a modification of the estimates of risk associated to this pathway of entry.

Objectives

This report aimed at updating the estimates of the risk for ASFv introduction into the US through prohibited swine products carried by air passengers and identifying locations and time periods at highest risk where and when preventive and mitigation measures may be implemented.

Material and methods

A quantitative stochastic model was developed to assess the probability of ASFv entry into the US through PSPAP (prohibited swine products carried in air passengers' luggage). The space units used in this study were country level for origin (128 countries) and US airport for destination (87 US airports).

- The level of risk was assessed by month and annually.
- The risk model was developed in @RISK 7.5 (Palisade Corporation, Newfield, NY, USA) on Microsoft Excel 2007® and run 10,000 iterations using Monte-Carlo sampling method.
- The detailed structure, parameters, inputs and outputs of the model have been previously described ([Jurado et al., 2018](#)).



Results:

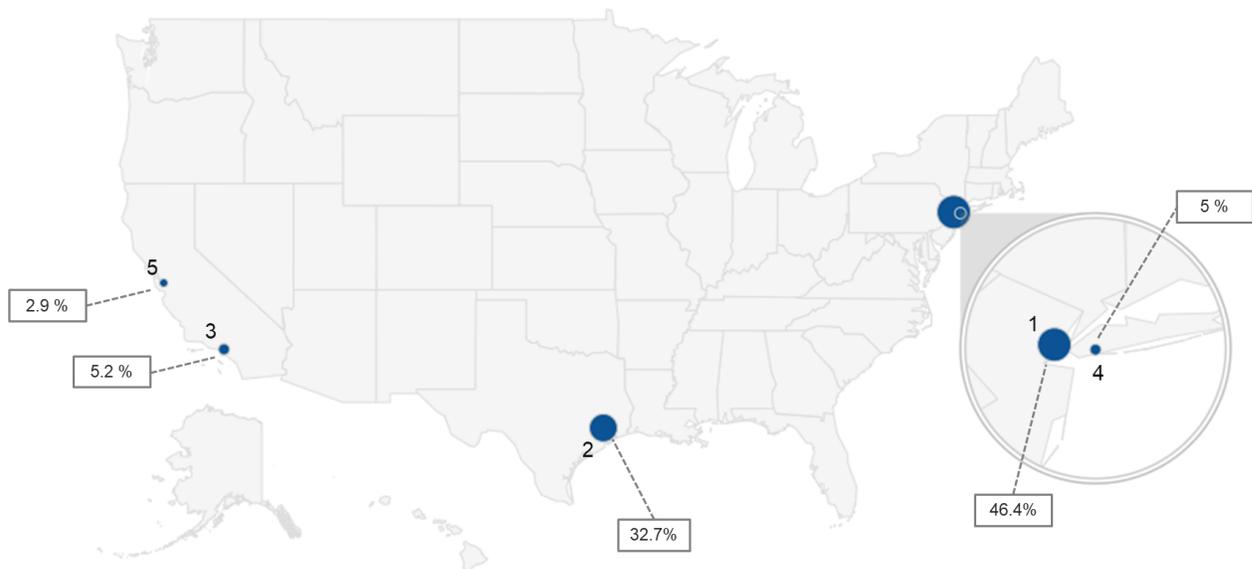
Results suggest there is a high risk that ASFv is currently reaching US airports in air passengers' luggage, prior to customs inspection, which is consistent with the detection of ASFv in seized pork in a number of Australian and Asian airports. The risk of introduction decreased substantially after customs inspection. However, the mean risk of ASFv introduction into the US through illegal products carried by air passengers has increased 183%, compared to the risk estimated before the disease spread into China, East Asia, and Western Europe in 2018 and 2019.

Most of the risk (greater than 50 percent) was associated with flights originated from China and Hong Kong, followed by the Russian Federation (27 percent).

Data showed risk was highest in summer and five airports accounted for >90% of the risk:

- Newark, New Jersey
- George Bush, Houston, Texas
- Los Angeles, California
- John F. Kennedy, New York, New York
- San Jose, California

Figure 1. Risk results of ASFv entry into the US through prohibited swine products carried in air passengers' luggage. Zoomed map of the ASFv annual average risk at US international airports. Five airports received over 90% of the total annual risk: 1. Newark-New Jersey; 2. George Bush-Houston-Texas; 3. Los Angeles-California; 4. John F. Kennedy-New



Conclusions and Implications

Results suggest the risk for ASFv introduction into the US via smuggling of pork in air passengers luggage has dramatically increased in 2018 and 2019, compared to previous years. This data will help to inform surveillance strategies for the disease in the US, with the ultimate objective of preventing, or mitigating the impact of an hypothetical ASFv incursion into the country.

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