

**Risk-based surveillance of chicken diseases using poultry trader networks in Oromia Regional State, Ethiopia**

*Vallée, E.<sup>1,2</sup>, Waret-Szkuta, A.<sup>2,3</sup>, Duboz, R.<sup>2</sup>, Chaka, H.<sup>4</sup>, Balcha, M.<sup>4</sup> and Goutard, F.<sup>2</sup>, <sup>1</sup>Massey University, New Zealand, <sup>2</sup>CIRAD, AGIRs, France, <sup>3</sup>INP-ENVT, France, <sup>4</sup>NAHDIC, Ethiopia; [flavie.goutard@cirad.fr](mailto:flavie.goutard@cirad.fr)*

Highly pathogenic avian diseases such as Newcastle disease and avian influenza have serious social and economic impact in developing countries, including Ethiopia. Live bird markets and poultry traders are known risk factors for the spread of these diseases. In Ethiopia, Oromia regional state is an active chicken breeding region and the live bird markets are located on the main poultry trade road to the capital city Addis Ababa. The networks of chicken movements between 29 shared markets in Oromia regional state were built for festive and non-festive seasons, using a ‘trader questionnaire’ survey. Five centrality indices, in-degree, out-degree, in-closeness, out-closeness and random-walk betweenness, were calculated and the markets were ordered according to these indices. The festive seasons did not appear to impact the network structure, implying no necessary change of surveillance and control policies during these periods, merely a strengthening due to an increased volume of traded chicken. Three markets emerged as central in the network, with different epidemiological roles. Our findings indicate that these three poultry markets would ideally be chosen in a risk-based type of surveillance system and in targeted control policies.