DASHBOARD of

Human mobility patterns to inform sampling sites for early pathogen detection and routes of spread: a network modeling and validation study.

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Dashboard Description

A dashboard enabling direct access to state hubs ranking, gateway cities and paths of transmissions is available (https://aesop.outerlamce.com/sankey).

Analyzing all pathways starting from cities in each state enables the creation of a ranking that assesses the likelihood of early pathogen detection capacity of each city. This ranking further facilitates the identification of cities according to their significance as mobility gateways to other states. Mobility gateways are defined as cities for which the first step in the most likely paths originating from them leads to cities in other states.

According to the BI score, pre-selected cities in Acre are Rio Branco (the state capital), Cruzeiro do Sul, and Sena Madureira. In the event of a pathogen emergency in a city in Acre that goes undetected, Rio Branco and Cruzeiro do Sul emerge as the most probable cities for pathogen detection using the sentinel approach. Approximately 33·5% and 23·2% of paths starting in Acre use these cities as the first step, respectively. **Figure 1** provides a visual representation of the pathways from cities in Acre to the 1391 selected semi-hubs across the country. Moreover, the list of gateway cities features Rio Branco and Sena Madureira as the key priority points for mobility to other cities outside of Acre.
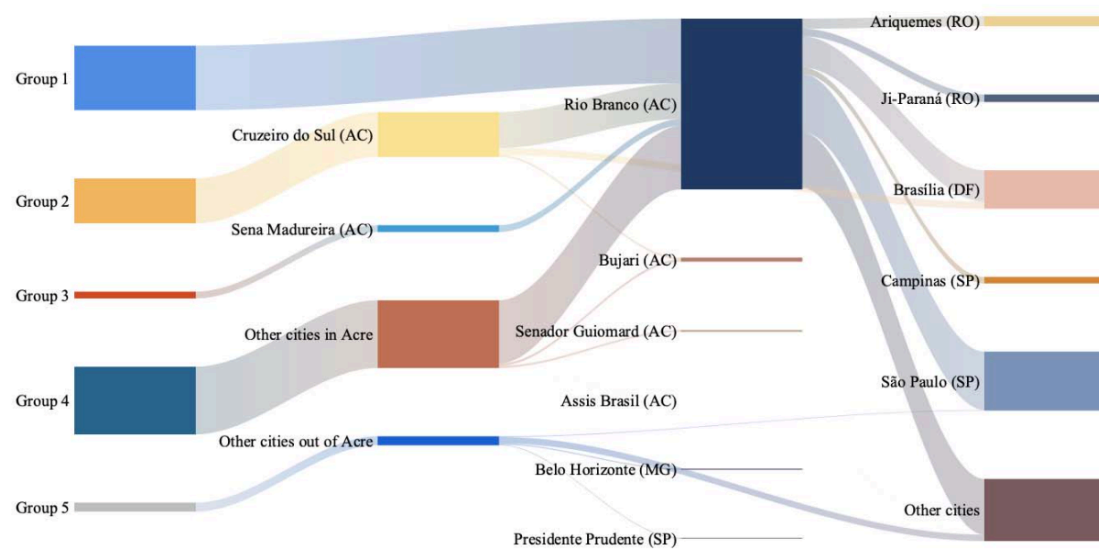
Figure 1 - Transmission routes for cities in the state of Acre, North Brazil.

Groups 1, 2 and 3 represent cities in Acre, with Rio Branco, Cruzeiro do Sul and Sena Madureira as their respective first-step cities. Group 4 comprises cities with the first step being a non-pre-selected city according to the BI in Acre. Group 5 includes cities with their first step being cities with high BI scores in other states.