Agricultural Cover

PERCENT OF TOTAL AREA

35 45 50 55 65

Methods cont.

A similar process was utilized to calculate an “environmental vulnerability composite.” The environmental indicators utilized Modis land cover. The raster data sets queried total land cover for both forests and agriculture from 2002 and 2012. The difference between the two showed total land cover change over ten years. Similar to above, individual environmental vulnerability variables were aggregated to produce a composite score and symbolized to show variation across municipalities.

The social and environmental composites were then added together to form a vulnerability analysis complete with both social and environmental variables.

Results & Discussion

Including both social and environmental variables in the vulnerability assessment suggested that far fewer individuals were at high risk (~17.5 million) than in the purely social analysis. This is likely because municipalities with high social vulnerability and environmental vulnerability became significantly worse off than the communities only burdened with social vulnerability.

There are a couple of limitations to this analysis. First of all, data utilized in this analysis was largely from 2007, and therefore social vulnerability scores could fail to represent the current reality of the social landscape in Brazil. Furthermore, environmental variables were limited to land cover change along the lines of forest and agriculture. Many other variables could be included: temperature and aspect, to determine ideal breeding grounds for mosquitos, water bodies, and the range of habitat for different host species. These variables should be included in future analysis. Finally, it was assumed that each variable held equal weight in determining the vulnerability to zoonoses, however, in reality it is probable that the weight of each of these variables depends on where the individuals live.

Social Vulnerability

Deforestation and human vulnerability

Methods

Over the course of this project, three vulnerability analyses were performed for Brazilian communities on a municipal level using different combination of indicators. First, vulnerability was assessed using social variables from the Brazilian census. Age, socioeconomic status, population density, and distance from the nearest “Basic Health Unit” were classified at natural breaking points and symbolized at a municipality level to show the distribution of data within the larger population. Each of these classifications received a vulnerability “rank” from 1-5, with 1 being the least vulnerable and 5 being the most vulnerable. This individual vulnerability was then aggregated to develop a “social vulnerability composite.”