

Mapping Human Migration and Meningitis in Niger

T. Timberlake¹, S. Adamo², S. Trzaska³

¹ Sustainable Development, Columbia University. ² Center for International Earth Science Information Network, Columbia University. ³ International Research Institute for Climate and Society, Columbia University.

The Sahel region in Africa is often referred to as the Meningitis Belt due to the region's high meningitis prevalence. To combat the disease's significant detrimental effects to welfare, it is necessary to understand why this region is so vulnerable to it. A range of factors is known to be associated with the occurrence of epidemics, and a possible influence of human migration patterns has been hypothesized but hardly studied. The objectives of this project were to evaluate available data on migration from the literature and to derive migration patterns that were then used to inform an exploration of connections between migration and meningitis. Niger, one of the countries in the meningitis belt, was used as a case study because of the availability of epidemiological data, which contrast with the scarcity of data and research on migration. The first step was to arrange a literature review on migration in Niger from a series of sources into a bibliographic database. This database was used to create GIS maps of available information on types of migration by district and region. Then, data from Niger's 2001 population census was used to identify and quantify migration patterns. Finally, possible connections between frequency of epidemics and migration levels of districts were explored. Data available in migration studies was notably sparse; however, the most relevant finding was the existence of seasonal, rural-urban population movements as means for supplementing agricultural incomes during dry seasons. ESDA techniques for examining spatial associations demonstrated that statistically significant spatial autocorrelation of frequency of epidemics and mobile population percentage each occurred. Though the spatial analysis at this stage was limited by the availability and resolution of migration data, the project provides a constructive starting point for future exploration of migration patterns and meningitis in Niger.