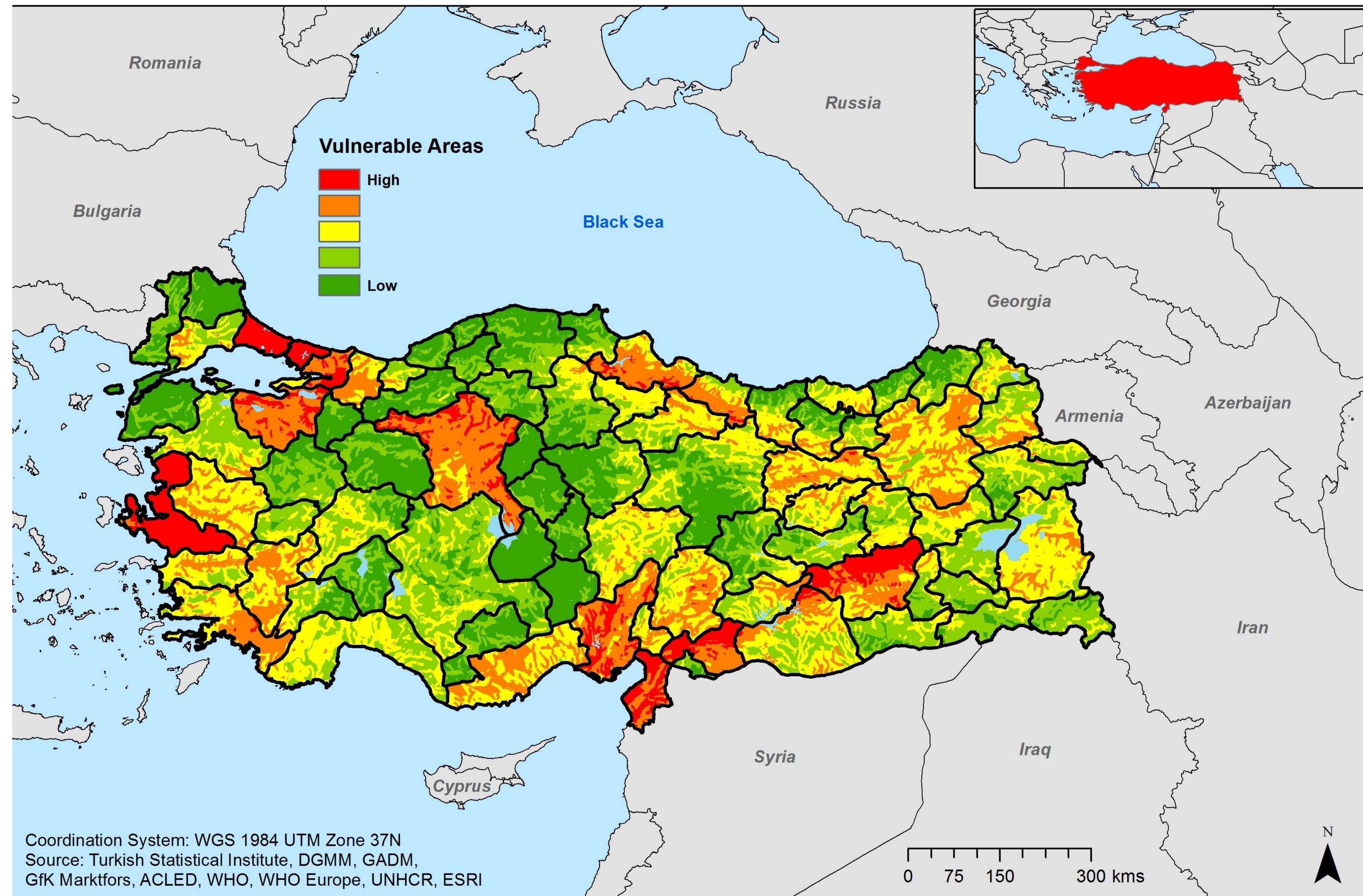


# Infectious Diseases Vulnerability Assessment in Turkey, 2018

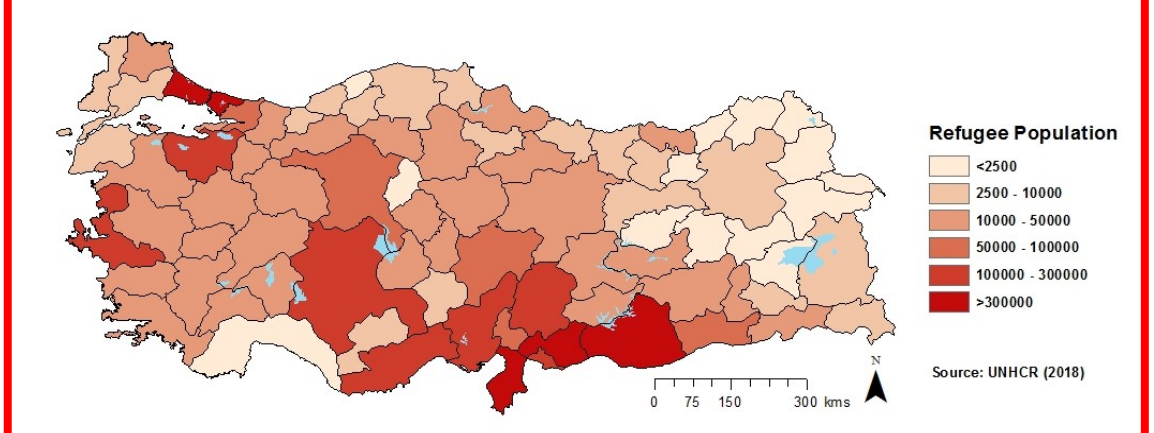
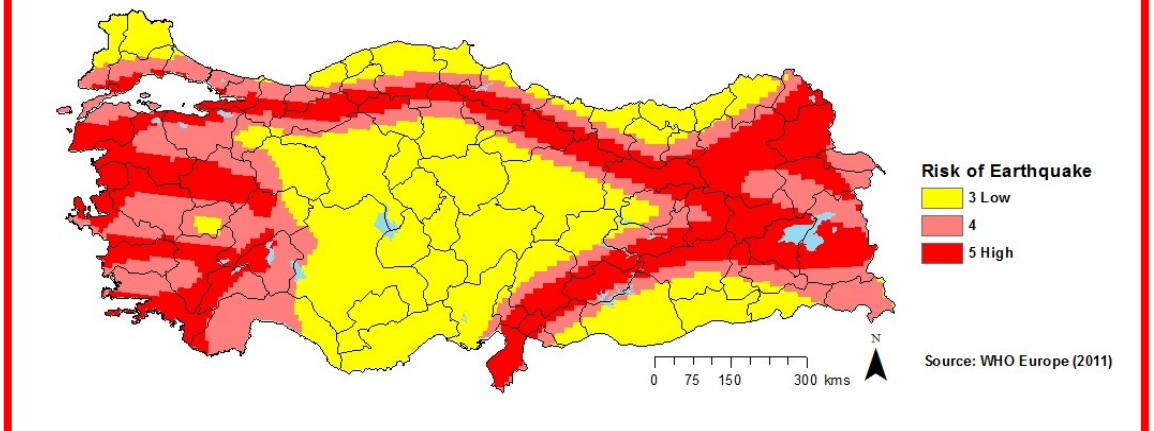
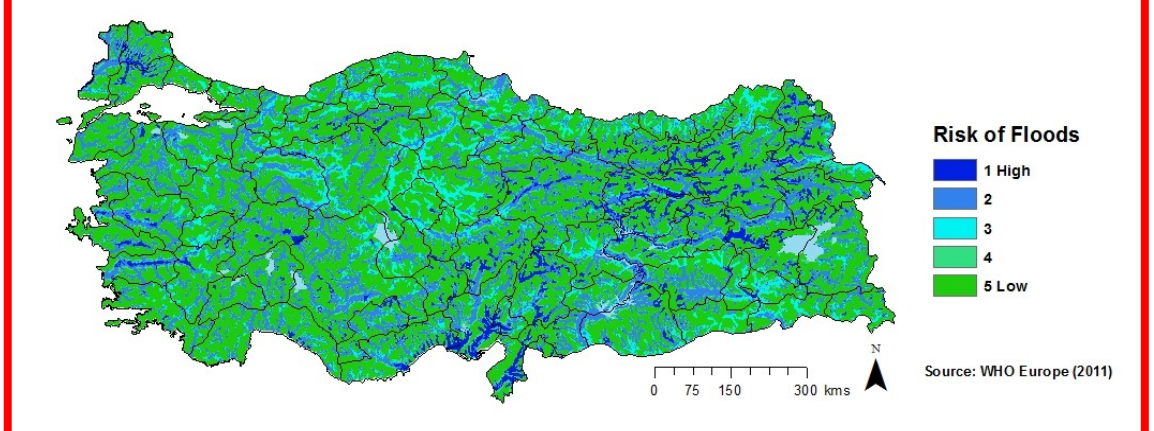
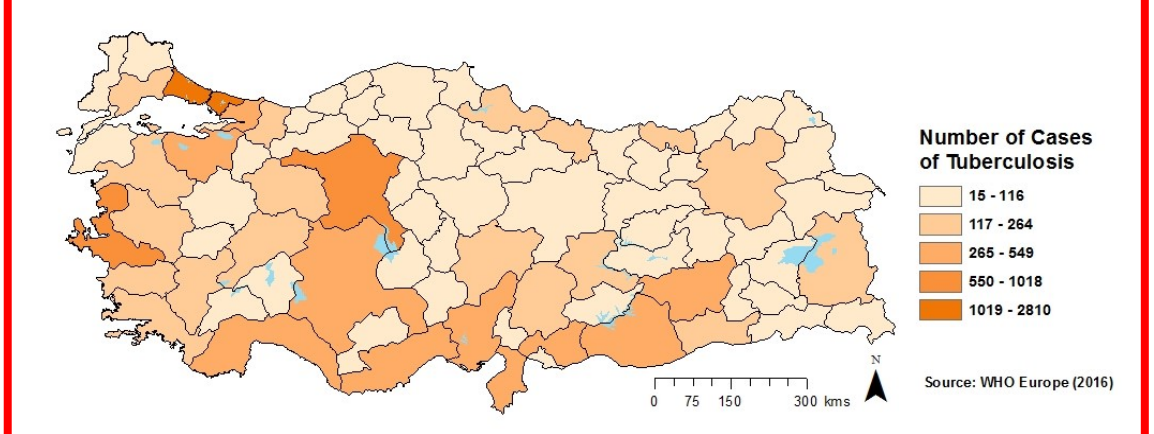
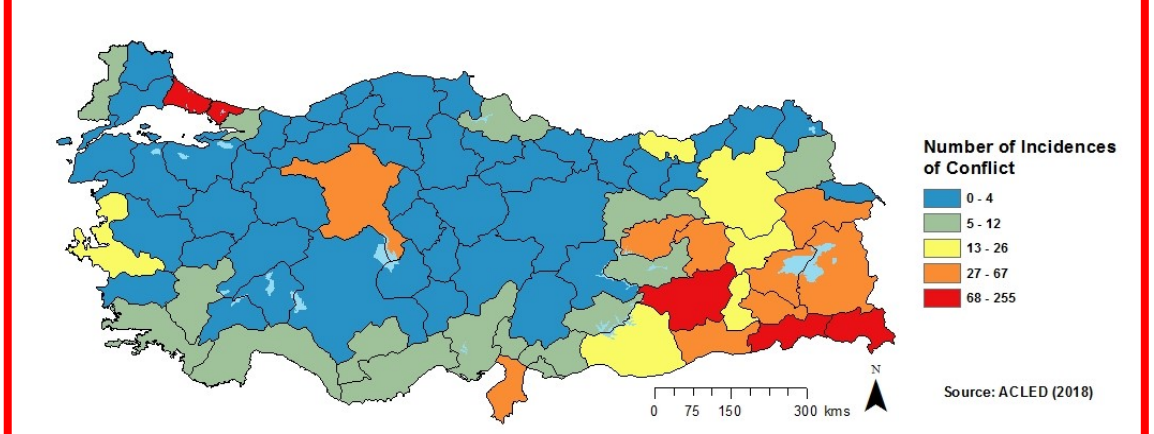
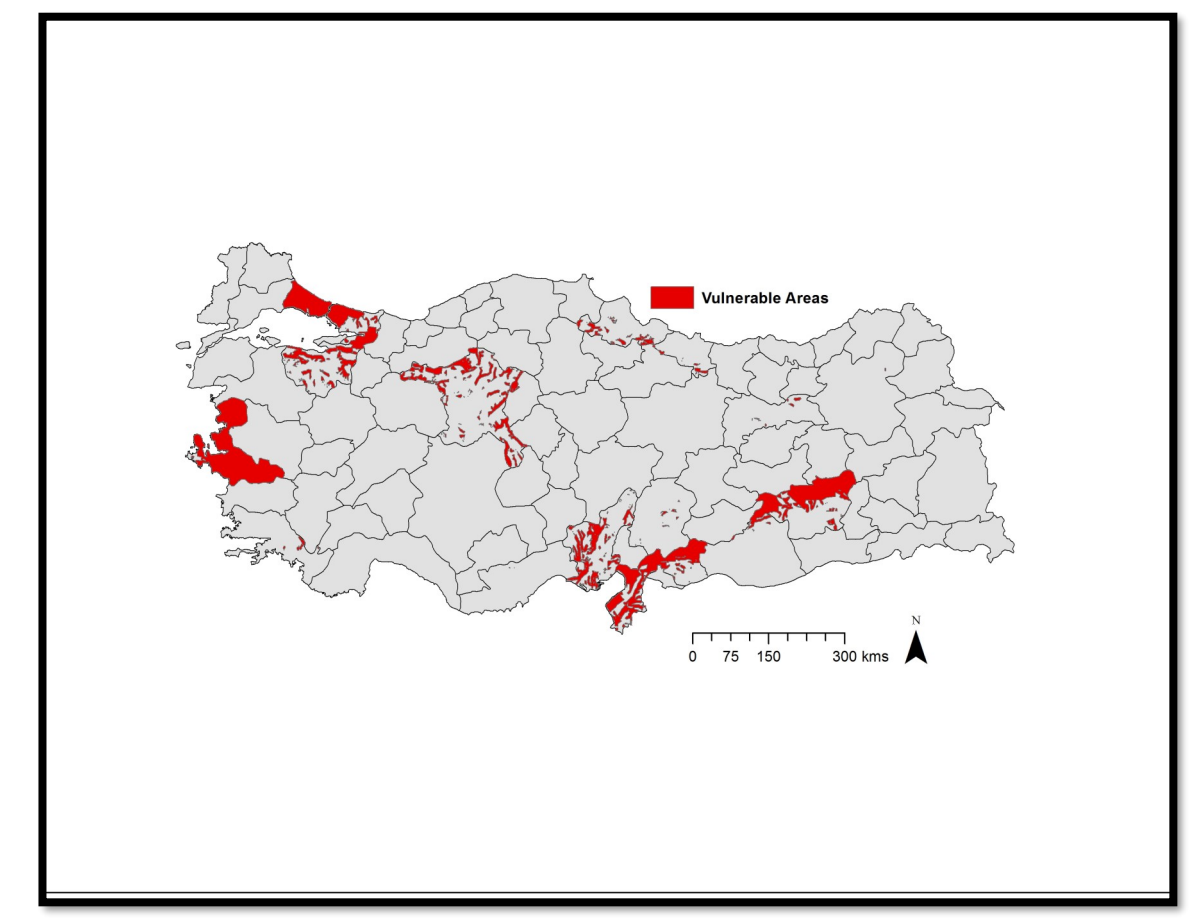


Host Population at Risk	
Adana	626,384
Ankara	1,298,605
Bursa	845,058
Diyarbakır	829,989
Gaziantep	1,119,087
Hatay	945,296
Istanbul	14,207,452
Izmir	4,088,984
Kocaeli	755,861
Samsun	141,083
Şanlıurfa	73,190

## Conclusion

To answer the first research question, a map is created to show the number of refugees in Turkey by province. The most number of refugees are located in the South of the country, closer to the border with Syria, as well as in Istanbul.

For the infectious diseases, the refugee and host population is particularly vulnerable to the spread of tuberculosis, leishmaniosis, measles (among children), Hepatitis, and HIV. Although no incidence rates were found for HIV and malaria, there is still a huge concern of spread of these diseases because of the influx of refugees in Turkey. To calculate the vulnerability, I used the tuberculosis incidence rates information for Turkey as an estimate for the incidence rates of other infectious diseases.



## Background

As of October 2017, there were more than 3.5 million refugees in Turkey -- which according to United Nations' Refugee Agency United Nations High Commissioner for Refugees (UNHCR), is one of the world's largest refugee population. In 2011, a deadly civil war broke out in Syria and since then, Turkey has become home to a large number of refugees from Syria. Among others, Turkey also hosts refugees from Afghanistan, Iraq, Iran, and Somalia. While the Turkish authorities runs camps to house these refugee populations, more than 90% of these refugees in Turkey live outside of camps in urban and peri-urban areas -- scattered all across the country.

When they migrate from their home countries, the refugees are vulnerable and susceptible to contracting infectious diseases. The idea of the project is to map the vulnerability of the refugees to infectious diseases. This mapping will eventually help in better surveillance of breakout of infectious diseases and thereby help in preparing for appropriate response.

## Methodology

This project aims to determine: where refugees are most populated in Turkey and of those regions where is the population most vulnerable to infectious diseases?

The project creates a vulnerability score using 10 different factors were included as follows: population density; population of refugees; number of physicians (health); density of refugee health care centers; density of terrorist attacks (security); risk of flood and earthquake (natural disaster); distance from roads (access to healthcare services) and from river (risk of spread of infectious disease); and occurrence of Tuberculosis in the host population (estimate for all infectious diseases).

Each attribute was given scores based on natural breaks (Jenks). Population At Risk Calculation: The highest risk (dark red) areas were identified via reclassification and tied to the population density, using zonal statistics. The vulnerability scores of provinces were then aggregated to create a final map.

Cartography and Design by Pulkit Aggrwal  
May 8, 2018  
DHP P207 - GIS for International Applications  
Professor Patrick Florance

**THE FLETCHER SCHOOL OF LAW AND DIPLOMACY**  
TUFTS UNIVERSITY

