TITLE: Healthcare Infrastructure and Gap Analysis at District Level, Uttar Pradesh, India

Group ID: Mapathon3580
Team Member: Hemank Vats (Lead)
         Anju
         Priyanshu Prasad
         Yazura Shankhdhar
Organisation: IIT (BHU), Varanasi
Contact/email: hemankvats25@gmail.com

Introduction

The latitude and longitude of Uttar Pradesh are 26.8467°N and 80.9462°E. Being the most populous state, Uttar Pradesh also has the greatest number of districts i.e., 75. The majority of the state's population live in rural areas where medical facilities are either not available or not up to the mark. The population density of the state is 828 persons per square kilo-meter.

Methodology

State's physical characteristics like hospitals, nursing homes and clinics have been mapped and analyzed using open-source software i.e., QGIS 3.16. To measure the physical characteristic mentioned above, data was collected from various datasets such as NITI Aayog, Census 2011 for population data and Google Earth Pro. For instance, density has been calculated by using different measurements like persons per square kilo-meter and source of information was collected from Census data.

To identify and import the above data, we used Google Earth Pro. Their locations were marked using latitudes and longitudes available on Google Earth Pro. This was also done manually to avoid mistakes like marking medical shops or fake institutes and other errors. This also helped in attending and adding data of each district separately. When all the institutes were marked, then they were imported in the QGIS software and several operations were performed on the data as to make it easy to read and analyze.

Specific Steps

1. District boundaries data sets were obtained from ISRO.
2. Datasets of hospitals was downloaded from Google Earth Pro and exported to (.KML) extension which could be then imported to QGIS.
3. Tiles which covered Uttar Pradesh was downloaded from BHUVAN.
4. After associating correct tiles with the location, certain attributes were linked with layers (excel saved as .csv and then dragged and dropped into QGIS). Population data and density was added in the attribute table of wards.
5. Population density map was prepared and viewed as graduated by clicking on properties of ward layer.
6. Hospitals were marked using the (.KML) files exported earlier directly into QGIS.
7. Then the analysis was done to calculate the density of population per hospital and number of hospitals for given unit of population or area of land as well.

Complexities

1. Data was not easily available from the local authorities; all data was mapped by the author itself.
2. Multiple districts were newly created and obtaining data for these districts was very difficult.
3. The data set contains various noise. (Multiple non-medical institutions added just because of name.)

Application

This map helps us to analysis and compare the population density with the number of hospitals in an area which in turn helps in planning of construction of hospitals. It also informs us about the areas where hospitals are not at all available or the number of hospitals available are very less.