TERRORISM AND ILLITERACY

A Geospatial Analysis of Pakistan from 1998—2012

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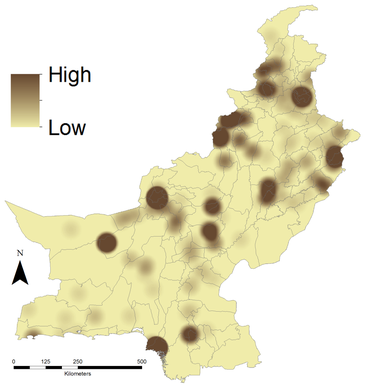
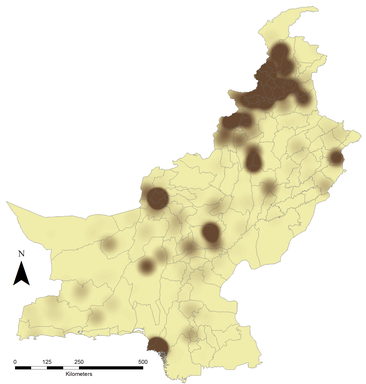
Terrorist Incidences

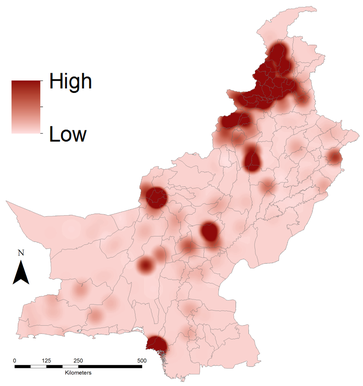
1998-2006



2007-2012

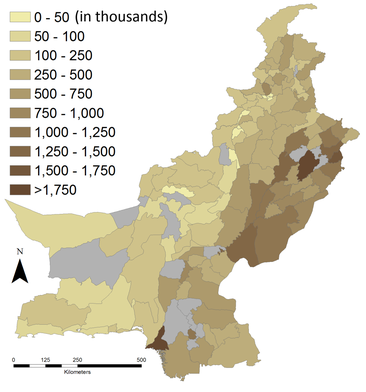


Increase from 1998—2012 (%)

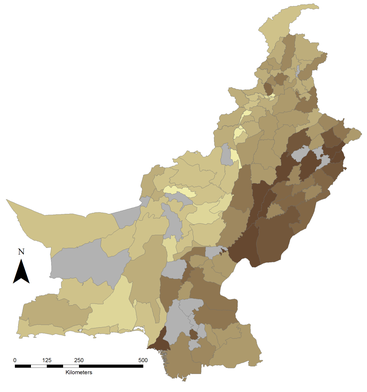


Illiterate Populations

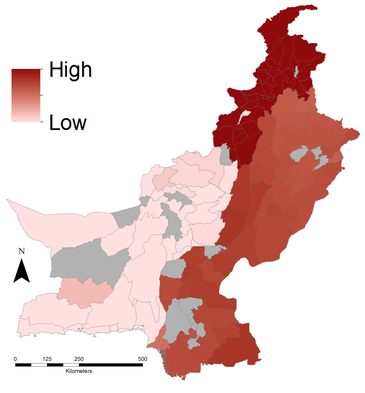
1998



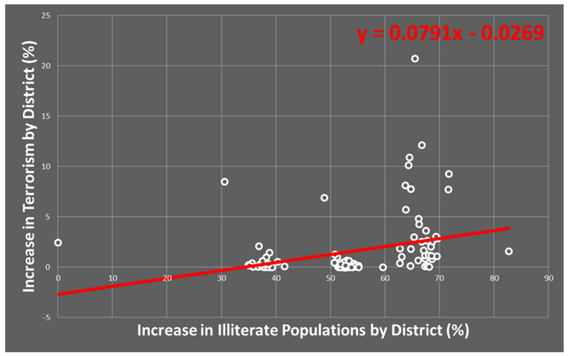
2012



Increase from 1998—2012 (%)



Increase in Terrorist Incidences and Illiterate Populations from 1998—2012



Map Projection: WGS 1984 UTM Zone 42N

Sources: Geonames, 2014; Global Terrorism Database, START, 2013; Common Operational Dataset (COD), UN OCHA, 2010

Overview

Pakistan has experienced a dramatic increase in the frequency of terrorist incidences over the past several years, rising steadily from a relatively low **37** recorded incidences in 1998 to **1,649** incidences in 2012. Terrorism can be explained by a range of risk factors, including individual characteristics, organizational traits, and social conditions. Pakistani officials in particular have frequently cited illiteracy as a major contributing factor to terrorism. In this study, I examine the relationship between terrorism and illiteracy using geospatial analysis.

Pakistan's latest census was completed in 1998. Since then, the population has grown dramatically from an estimated **135 million** to over **180 million** by 2010. The total illiterate population has also increased, though the literacy ratio is estimated to remain consistent.

Methodology

The START Global Terrorism Database (GTD) includes detailed records of thousands of terrorist incidences in Pakistan. As of 2012, the GTD records coordinates of terrorist attacks, which could easily be mapped in ArcGIS. Prior records included locations only by name, which varied in terms of spelling and administrative level identified. I addressed this issue by using an algorithm to match the location names available in the GTD to the list of geographic names available in Geonames, which are linked to coordinate data. Remaining unmatched records were matched manually. I categorized the cases of terrorism into a "before" group (1998-2006) and an "after" group (2007-2012). I generated a heat map that reflected the frequency of terrorist incidences by using a kernel density function, and I used a raster calculation to determine the percentage change in terrorism.

The UN OCHA Common Operational Dataset (COD) provides details of literate and illiterate populations by district in 1998 and 2010. I used a straight-line calculation to project the data to 2012. I joined the 1998 and projected 2012 illiteracy data to district-level geospatial shapefiles, which I then converted to raster files. I used a raster calculation to determine the percentage change in illiteracy. Some district data was unavailable, and is presented as gray zones.

To determine the intersection of the percentage change in terrorist incidences and the percentage change in illiterate populations, I performed a raster multiplication. High values reflect cases of high percentage increases in both terrorist incidences and illiterate populations.

Using the ArcGIS zonal statistics tool, I extracted by district the mean percentage increase in terrorist incidences and the mean percentage increase in illiterate populations. I then used the extracted data to generate a simple scatterplot and a linear model of best fit.

Results

On average, a 1% increase in the illiterate population increases the frequency of terrorist incidences by **.0791%** for each district. This analysis is not statistically rigorous, and it merely reveals a simple correlation between terrorism and illiteracy in Pakistan. However, it does lend some support to the assertion that illiteracy is a contributing factor of terrorism in Pakistan.