Spatial Analysis of Political Dynasties & Social Demographics in the Philippines: A Geographic Review of the Social Trends under the Duterte Presidency

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INTRODUCTION & RESEARCH QUESTION

Using ArcGIS software, this project assesses the geographic distribution of political dynasties alongside other social demographics in the Philippines. It looks specifically into the (1) spatial distribution of fat political dynasties across the country, (2) the hot and cold spots of the political dynasties, (3) and other spatial distribution of other social variables related to health (infant mortality rate), income (poverty incidence), education (functional literacy rate), and crime (drug-related deaths).

A **political dynasty** is defined as the "situation in which an incumbent official has at least one relative in elected office in the past or the present government." (Mendoza et. al 2013). Political dynasties are correlated with weak development outcomes, lower standards of living, and higher inequality, and increasing poverty (Mendoza 2012; Mendoza et. al 2012). Moreover, political dynasties are correlated with less effective and democratic governance (Tusalem and Pe-Aguirre, 2013). Incumbency has also been found to increase the probability of having a political dynasty (Querubin, 2019). A 2013 study found that 70% of Congress representatives are from a political dynasty. Similarly, in 2019, 80.25% of all gubernatorial positions were held by dynastical politicians (Mendoza et. al. 2013).

The following maps visual the areas that have higher rates of political dynasties, infant mortality rates, poverty incidences, functional literacy, and drug-related deaths in the 17 regions of the Philippines. **It adds to the growing literature on political inequality and its impact on human development.** Additionally, it is the first to use spatial analysis to explore the relationship among these variables. The time frame of analysis is the first three years of the former president Rodrigo Roa Duterte's term. 2016-2019 was defined by increased impunity, extrajudicial killings, and worsening inequality (Human Rights Watch, 2017; The Economist, 2021; Rappler, 2020). Projects like the Drug Archive have established that a typical victim was low-income. Little is known, however, about other inequalities that defined the context of drug killings. By studying these relationships, the project illuminates the trends that defined the first half of Duterte's presidency and the lives lost in the War on Drugs.

METHODOLOGY

ArcMap 10.8.3 was used to analyze the relationship between political dynastical and other variables. Political dynasties data is on the provincial level, while all other variables are on the regional level. All variables were visualized on choropleth maps. A Hot Spot Analysis (Getis-Ord Gi*) was also conducted on the political dynasty dataset to analyze the distribution of provinces with significantly high numbers (hot spots) or low numbers (cold spots) of political dynasties. Identify hot spots also creates comparability between the provincial level dynasty data and other variables on the regional level. To be a statistically significant hotspot, a province with high % of political dynasties must be surrounded by other features with high values as well.

Not all the variables are available for the the same year. As a rule of thumb, I chose datasets that fell within the first three years of Duterte's presidency. 2016 data on provincial % share of fat political dynasties is from APC's Political Dynasties Dataset. Census data on infant mortality data is from 2017, poverty incidence is from 2018, and functional literacy rate for those ages 16 to 64 is from 2019. RStudio was used to scrape data on drug-related deaths between May 10, 2016 to September 29, 2017 and to construct the correlation matrix visualization Finally, spatial information was sourced from gadm.org and National Mapping and Resource Information Authority (NAMRIA).

First, the spatial distribution of fat political dynasties % share by province was mapped into the Philippine geography. Hot and cold spots in the provinces were also identified. **Next,** the other factors relating to education, health, poverty, and drug-related crime were mapped on a regional level to reveal their spatial distribution. **Finally**, a correlation matrix of these five regional variables (literacy rate, drug-related deaths rate, fat dynasties % share, poverty incidence rate, and infant mortality) was created. The matrix summarizes the different correlations between two of the variables.

FINDINGS AND RESULTS

Spatial distribution **(Figure 1a)** shows that there are more provinces at the lowest quintile of the fat dynasties % share (yellow) than in the highest quintile (red). However, to analyzed whether a province has relatively many or few political families (spatial clustering), hot spot analysis was conducted. Using the contiguity edges method, hot spots are found in the top and center provinces of Luzon (northern island) and Sulu and Maguindanao (southern island), and cold spots are clustered in central Luzon (Mountain Province, Ifugao, Isabela) as well as the South Cotabato in the Mindanao **(Figure 1b)**.

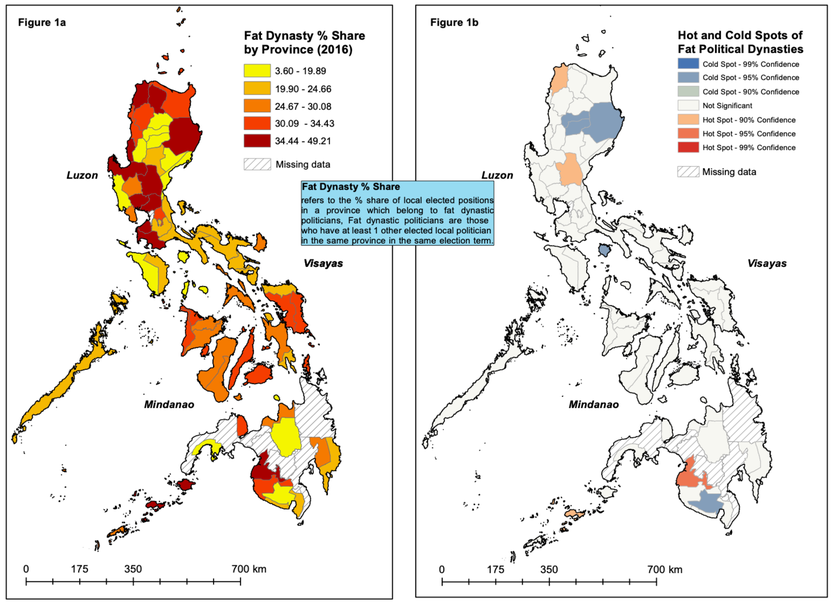


Figure 1: Political Dynasties in the Philippines (2016)

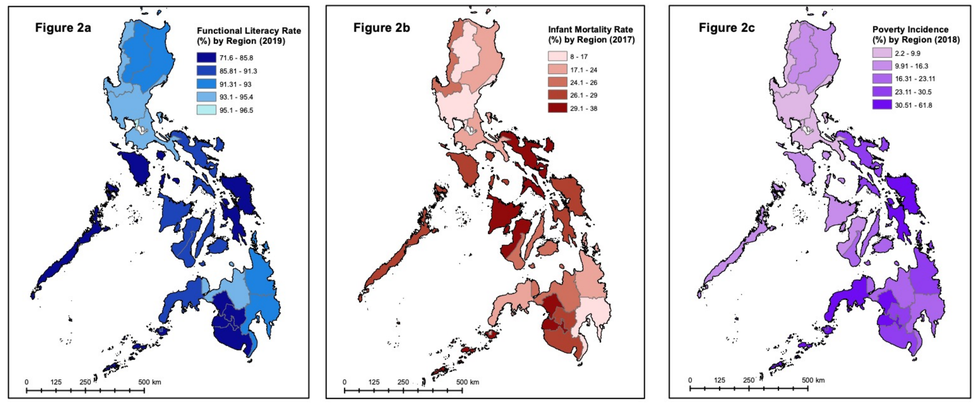


Figure 2: Education, Health & Poverty Trends by Region

Figure 2a-c shows a concentration of high literacy in Luzon, especially in areas adjacent to the capital, and some areas in the southern island Mindanao. Literacy has a negative relationship with infant mortality and poverty. In other words, areas with low literacy have higher infant mortality and poverty incidence.

Finally, **Figure 3** shows a stark concentration of drug-related deaths in areas with higher literacy, higher infant mortality, and lower poverty, though this trend is more pronounced in Luzon than in Mindanao. The capital is in Luzon.

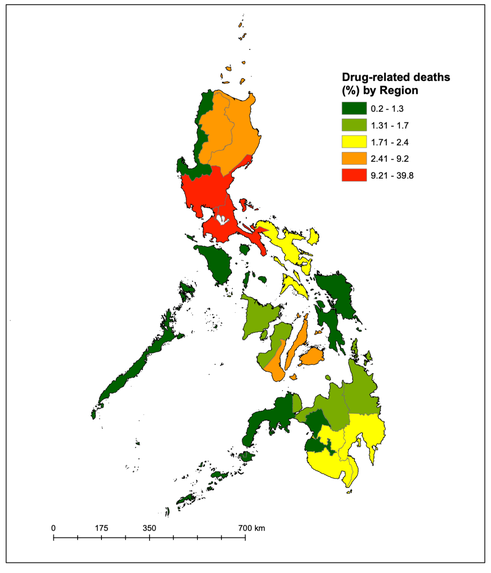
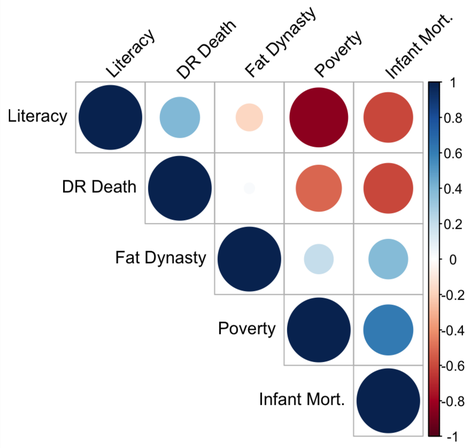


Figure 3: Drug-related deaths



The correlation matrix describes the relationship between the five variables. Infant mortality rates are negatively correlated with increased literacy and death but positively related to fat dynasties, poverty incidence. Poverty follows similar patterns. Fat dynasties are positively correlated with all factors except drug-related deaths. Drug-related deaths are negatively correlated with poverty, infant mortality and positively related to literacy and—to a lesser extent—to fat dynasties.

CONCLUSIONS

It is worth noting that the cold spots in central Luzon belong to 2 administrative regions, with Mountain Province and Ifugao in CAR and Isabela in Region II. Fat dynastical rule may therefore have less to do with regional boundaries. Spatially, the relationship between the number of political dynasties with social demographics is not as clear. For example, the hot spot in Luzon is in Nueva Ecija, a province located in Region III, is also within a region that has relatively higher functional literacy, but lower poverty and infant mortality rates. On the other hand, the hot spot in Mindanao is in Maguindanao, an area with the opposite set of trends. It may be that the correlation between fat political dynasties and lower quality of life is stronger outside of Luzon. This is substantiated by findings in the literature (Mendoza et. al, 2012). Drug-related deaths also exhibit an interesting pattern wherein higher rates of death are concentrated in Luzon and adjacent areas, pointing again to the possibility of deeper, geographic inequalities between Luzon and Mindanao islands.

The correlation matrix also provides evidence that fat dynasties are correlated with weaker development outcomes, showing a negative relationship with literacy and a positive relationship with poverty and infant mortality. Worth noting, however, is the positive correlation between fat dynasties and drug-related deaths. More political dynasties may entail more drug-related deaths. This is substantiated by the record number of local politicians killed during the period (ABSCBN, 2021). Still, this does not fully explain the complex relationship of drug-related killings with other variables. There is little doubt that individuals killed were often impoverished; however, over 68% of deaths in the sample were in the National Capital Region and its adjacent regions on the north and south (Region III & IV-A). It is possible that more data was collected in these regions because of greater media coverage. These regions are more urbanized with higher development outcomes, but the same regional characteristics may not be extendable to the specific segment of society that was targeted by the antidrug campaign.

IMPLICATIONS AND FUTURE RESEARCH

The spatial analysis reveals that several inequalities are at work. Political inequality in the Philippines, in the form of family's control of province positions, exhibits similar patterns with inequalities relating to health, education, poverty, and crime.

Because of the impact of fat political dynasties on a region's development outcomes especially in poorer areas, policymakers should prioritize increasing political inequality. One concrete way is to support the passage of anti-political dynasty laws that limit the proliferation of political clans. Bills to limit dynastical rule have been sitting in Congress since 1987. Moreover, programs to address poverty, infant mortality, and lower literacy in relatively low-income regions in Visayas and Mindanao must continue despite deeply embedded political clan rule. The similar spatial distribution of political dynasties with other social demographics confirm the correlation among inequalities, though there is a marked difference between regions in Luzon and in Mindanao. Policymakers should design mechanisms to safeguard programs from local corruption and control to combat social inequality even within the context of political inequality.

Future research should look deeper into alternative methods on collecting data on social demographics, and other possible explanations on the overconcentration of deaths in NCR and adjacent regions. Data collection, especially on crime, was challenging to collect. Moreover, more evidence on the positive correlation between deaths and prevalence of fat political dynasties is needed to fully understand their relationship. Finally, scholars have long pointed out the urban-rural divide as a structural issue in the Philippines. Further research on the geographic inequalities between Luzon and Mindanao is needed to fully analyze why the relationship between these variables look different.

REFERENCES

- PIDS Economic and Social Database & PSA OpenStat for social variables
- gadm.org & National Mapping and Resource Information Authority (NAMRIA) for geographic data
- APC for Political Dynasties Dataset
- The Drug Archive for drug-related deaths