PRESCRIPTIONS

POLICY BRIEF

Three Use Cases for Big Data in Universal Health Care
Developing Service Delivery Network Maps

POLICY LESSONS

A Data Governance Policy should be implemented in the Department of Health.
Datasets related to health were not interoperable and unstandardized. More meaningful analyses for health policy remain difficult.

The SDNs defined through the case provide a starting point for the defining of SDNs and the irrespective catchment areas on a national level.
PhilHealth claims were used as the first basis for the assignments of areas to SDNs, and it is presumed that the facility where the claim was filed and recorded is the facility of choice of the claimant. In order to account for the difficulty of measuring travel time and distance for all areas nationwide, it was presumed that the facility where the claim was filed is also the facility either nearest or with the shortest travel time for the claimant.

Medical Geography and the use of Geographic Information Systems tools such as ArcGIS and QGIS can aid in service provision planning.
The use of ArcMap and PhilHealth claims data, and health facilities data from the DOH Knowledge Management and Information Technology Service as well the Health Facilities and Services Regulatory Bureau can aid in the development of the Service Delivery Networks, one of the three guarantees of the Philippine Health Agenda. It can help in the geographic and spatial considerations for developing the SDNs, but must itself be complemented by other methods for designing SDNs, rooted in an understanding of local social contexts.

INTRODUCTION

In the Philippines, the Department of Health (DOH) and the Philippine Health Insurance Corporation (PhilHealth) are exerting great efforts towards the achievement of the Sustainable Development Goal (SDG) targets of reduced disease burden and Universal Health Care (UHC). Over time, the DOH and PhilHealth has amassed data about the nation's health and universal health care. Out of this wealth of unused data, big data analytics and data science can produce analyses and tools that will help DOH and PhilHealth gain insights that can assist them in making evidence-based decisions, improve organization operations, and implement targeted interventions in the achievement of the health agenda.

The current health agenda guarantees delivery of services through Service Delivery Networks (SDN), which is defined by DOH Administrative Order (AO) No. 2017 - 0014 as a "network of organizations that provides or makes arrangements to provide equitable, comprehensive, integrated, and continuous good quality health services to a defined population, with minimum duplications and inefficiencies." The overall aim of SDNs in the Philippines is as a vehicle to deliver a comprehensive range of quality health services to Filipinos, that are geographically and financially accessible.

This project was a proof of concept for the DOH and PhilHealth to explore the uses of big data and data science as important tools to use in pursuit of providing the guarantees promised in the PHA. The project did this by applying big data methods in three topics highly relevant to the DOH, one of which is the use of geospatial data in producing maps to aid in the building of the SDNs.

METHODS

The methods utilized in the Dartmouth Atlas in the USA were adopted. The method uses four steps. The first is identifying all referral facilities in the Philippines, using definitions contained in AO 2017-0014 Framework for Redefining Service Delivery Networks. The second is analyzing the 2015 PhilHealth claims records to determine the catchment areas for each facility. The claims data contains the municipality of origin of a claimant. PhilHealth claims per catchment area are

tallied, and the referral facility catchment areas are assigned to the Apex Hospitals where plurality of its claims are filed. The municipalities assigned to a single Apex Hospital constitute the SDN catchment area. The third is visualizing these on mapping software. The fourth is reassigning areas to ensure that SDN catchment areas are geographically contiguous if land based, or adjacent, for areas that include islands.

RESULTS

A total of 25 different SDNs were identified and mapped. The majority of the SDNs are in the island of Luzon, with several smaller SDNs defining the central to northern Luzon area. The larger islands in the middle of the archipelago, namely Palawan, Panay, Mindoro, Cebu, Bohol, Leyte, and Samar are not subdivided by SDNs save for Samar. SDNs in the Visayas region roughly correspond to the current regional administrative divisions save for Palawan, which shares with Panay, and Negros, which belongs to its own SDN. Mindanao is divided into 5 sections, approximating the current regional administrative divisions, save for ARMM, where the Sulu archipelago including Basilan share with the Zamboanga peninsula, and not with Cotabato, Maguindanao, and Lanao del Sur.

CONCLUSION

The SDNs produced from the use of GIS and existing data show SDNs that revolve around major urban centers, normally located on low lying areas, and where the DOH retained hospitals are located. A total of 25 such as SDNs are produced with a significant number in Luzon due to the larger number of DOH retained hospitals in that island. These SDNs in general are not delineated along current administrative and political boundaries.

It needs to be emphasized however that these SDNs were defined using the data available. If more complete data were available, these SDNs can be defined using more sophisticated tools. For example, if hospital admissions data were available for all hospitals, then the SDN mapping could account for patients not currently utilizing PhilHealth. If road network data were available, then a network analysis could have been conducted, allowing for a much better analysis of distance than proximity analysis could accomplish.

RECOMMENDATIONS

- **Researchers should study the proposed models of government decentralization and determine where SDNs can be located in varied governance architectures**. While the revision of the constitution and the structure of government is still unclear, models are already proposed in Legislature. Various models and types of decentralization, whether in Federalist or Unitarian states, need to be explored in research on constructing SDNs (Araral et al., 2017).

- **Researchers should continue to determine optimal methods for designing and constructing SDNs.** The analysis of this study posits a method based on PhilHealth claims as an indicator of facility access, and the maps produced may already serve as initial starting points in development of SDNs. This study also began the definition of SDNs from the national level. Construction of SDNs beginning with individual facilities may also be explored.

- **Given the paucity of road network data, researchers intending to use geographic analysis on travel times should devote effort into producing primary data**. Free and open source tools, such as the Open Data Kit (ODK) may be used, open source datasets such as OpenStreetMap may be tapped, among others.

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