EpiMetrics, Inc.

Big Data in Universal Health

Case 2: Developing a Service Delivery Network

EXECUTIVE SUMMARY

Abstract

The project applied big data methods in three topics highly relevant to the DOH – social determinants of health (SDH) versus universal health care (UHC) inequalities, geographical inequalities, and outlier detection. The second case used geospatial software for the DOH that can visualize and analyze performance for indicators at the LGU-level for service delivery networks (SDNs), DOH programs and departments, SDH and health inequities, and LGU health statistics.

Since the application of big data in the Philippine setting is an emerging field, this project was a proof of concept for the DOH and PhilHealth to explore the field for important tools in the monitoring and evaluation of public health. With big data, analysis of diverse and voluminous data becomes possible, and the DOH can gain insight into the factors that significantly impact and influence the health of the nation. However, mechanisms and policies must be put in place to ensure that data is available, accessible, and of good quality in order to properly apply big data analytics**.** Case 2 aimed to investigate how can big data be can used to develop a nationwide Service Delivery Network and map out inequities in SDH and UHC.

Data from PhilHealth and DOH were utilized as baseline data. GIS mapping software was mainly used to analyze the health facilities being studies using PhilHealth and DOH data.

A total of 25 different SDNs were identified and mapped. The majority of the SDNs were in the island of Luzon. SDNs in the Visayas region roughly correspond to the current regional administrative divisions. Mindanao was divided into 5 sections, approximating the current regional administrative divisions. In case 2, the unavailability of viable data led to a change in the intended outputs. Several reasons for unavailability were identified: 1) the DOH Data Governance is not established thus resulting in difficulty gaining access to large, properly documented data sets, and 2) the compliance rates of non-DOH government-owned sources were limited. For Case 2, instead of a comprehensive temporal spatial map, SDN maps were made. Case 2, in general, measured the association of SDH-driven health inequalities and their relationship with UHC-related inequalities while providing possible spatial configurations for service delivery networks (SDN).

As technology advances, the Philippines must take advantage of its available healthcare related data and improve on it for better utilization and application. Case 2 measured the association of SDH-driven health inequalities and their relation with UHC-related inequalities while providing possible spatial configurations for service delivery networks (SDN). This case also highlighted the use of GIS mapping software which can be used to provide significant insights into the geography of health care.

Executive Summary

A. Introduction

Government agencies, specifically, the Department of Health (DOH) and the Philippine Health Insurance Corporation (PhilHealth) have been amassing data about the nation's health, universal health care, and on the social determinants of health (SDH). To assist the Department of Health (DOH) and the Philippine Health Insurance Corporation (PhilHealth) in the achievement of national and global health goals for sustainable development, this project used big data tools to maximize the generation of actionable information from the amassed data. Moreover, since the application of big data in the Philippine setting is an emerging field, this project was a proof of concept for the DOH and PhilHealth to explore the field for important tools in the monitoring and evaluation of public health.

B. Methods

The methods utilized in the Dartmouth Atlas were adopted on PhilHealth claims data. The data required for the development and visualization of service delivery networks (SDNs) are the following: base map, health facilities, and claims. Municipal, provincial, and national data for the base map was sourced from Global Administrative Areas. Health facilities data were retrieved from DOH KMITS, DOH HFSRB, and PhilHealth. Claims data from January to December 2015 were taken from the PhilHealth claims data.

A total of 25 different SDNs were identified and mapped. PhilHealth claims were used as the first and primary basis for the assignments of municipalities to health facilities. Proximity analysis was used as secondary basis for assignments, where there was insufficient data from the databases retrieved from PhilHealth and the DOH. A tertiary basis was the re-assigning of "orphan" areas.

C. Results and Discussion

A total of 25 different SDNs were identified and mapped. The majority of the SDNs were in the island of Luzon. SDNs in the Visayas region roughly correspond to the current regional administrative divisions. Mindanao was divided into 5 sections, approximating the current regional administrative divisions. In case 2, the unavailability of viable data led to a change in the intended outputs. Several reasons for unavailability were identified: 1) the DOH Data Governance is not established thus resulting in difficulty gaining access to large, properly documented data sets, and 2) the compliance rates of non-DOH government-owned sources were limited. For Case 2, instead of a comprehensive temporal spatial map, SDN maps were made. Case 2, in general, measured the association of SDH-driven health inequalities and their relationship with UHC-related inequalities while providing possible spatial configurations for service delivery networks (SDN).

D. Conclusions and Recommendations

The application of Big Data in the Philippine setting is an emerging field. This study proved that it is possible to utilize big data tools to create outputs that will contribute to the decision-making process in the healthcare system. Complementing case 1, this study measured the association of SDH-driven health inequalities and their relationship with UHC-related inequalities while determining the spatial and temporal variation at the LGU-level as seen in the development of service delivery network (SDN) map.

As technology advances, the Philippines must take advantage of its available healthcare related data and improve on it for better utilization and application. It is important that the country, particularly the Department of Health, invests in data governance. Mechanisms and policies must be put in place to ensure that data is available, accessible and of good quality in order to properly apply Big Data analytics.

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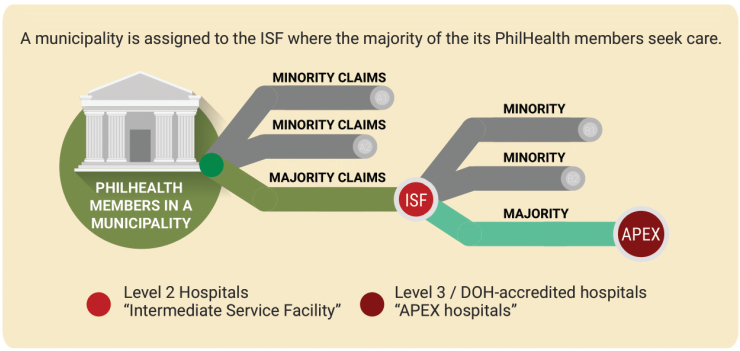
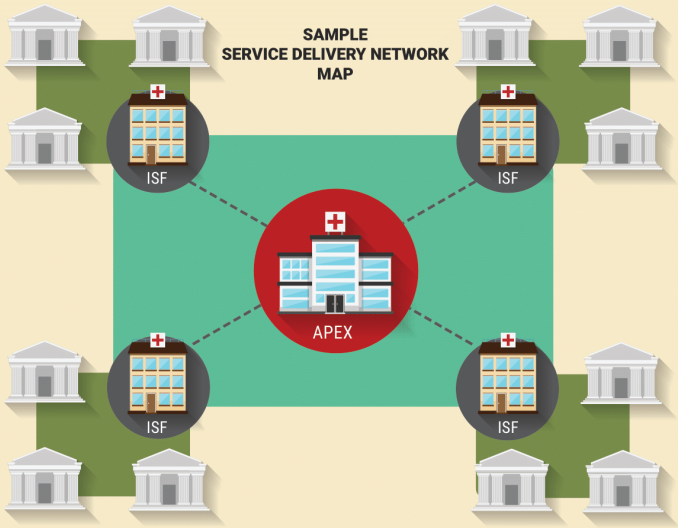
MAPPING SERVICE DELIVERY NETWORKS



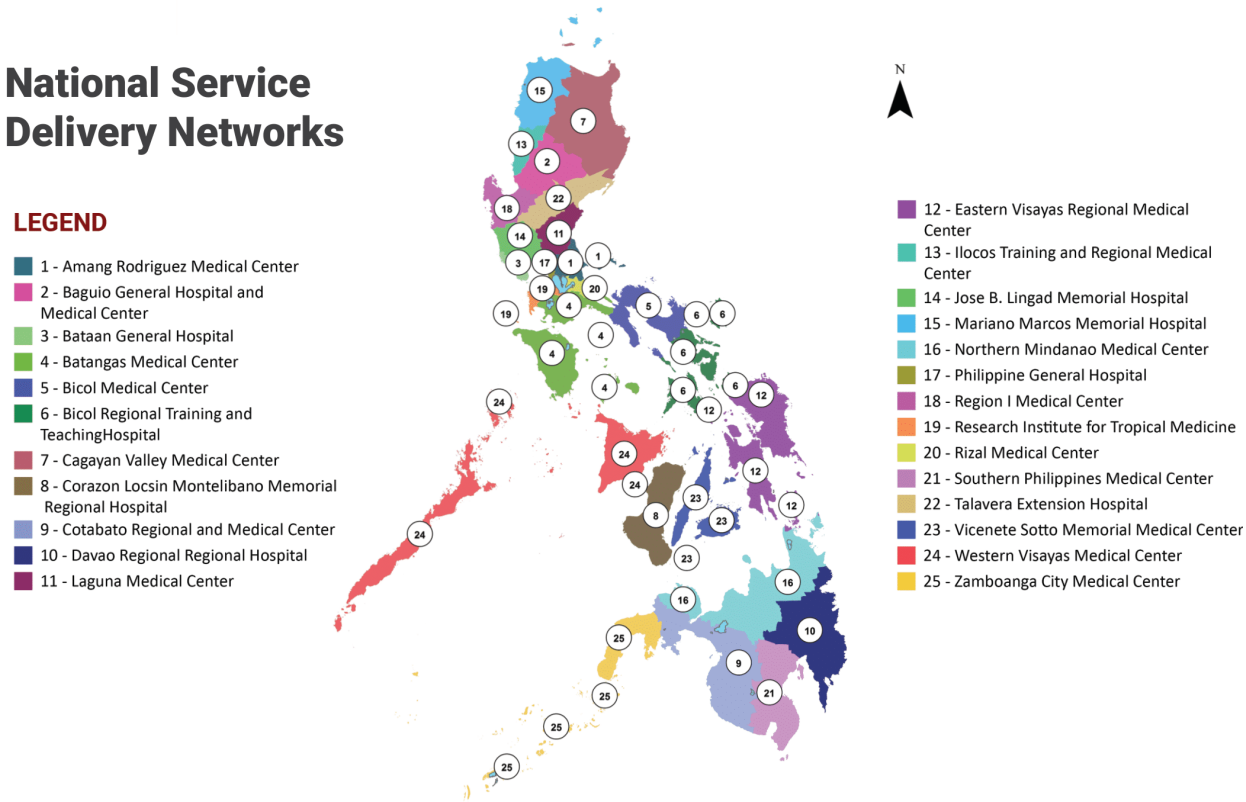
The Department of Health's Administrative Order (DOH AO) no. 2017-0014 defines Service Delivery Networks (SDNs) as a "network of organizations that provides or makes arrangements to provide equitable, comprehensive, integrated, and continuous good quality health services to a defined population, with minimum duplications and inefficiencies." The overall aim of SDNs in the Philippines is to act as a vehicle to deliver a comprehensive range of quality health services that are geographically and financially accessible.

In this project, the generation of SDN maps followed the methods used in the Dartmouth Atlas. Definitions of the SDNs followed those contained in the DOH AO 2017-0012 Framework for Redefining Service Delivery Networks: local pharmacies, barangay health stations, rural health units, outpatient clinics, ambulatory surgical centers, laboratories, level 1 or 2 hospitals, and mobile health services.

Data analysis followed a four-step process:
(1) Mapping available health care providers,
(2) Designating municipalities to facilities,
(3) Visualizing the SDNs, and
(4) Refining the SDN maps.



National Service Delivery Networks



ORIGINAL RESEARCH: Wong, J, and Estanislao, R.D. (2018) Use Case of Big Data: Service Delivery Network Mapping. Makati City: EpiMetrics, Inc.

EpiMetrics HEALTH EQUITY THROUGH RESEARCH

Figure 1. Map of Service Delivery Networks in the Philippines

EpiMetrics

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