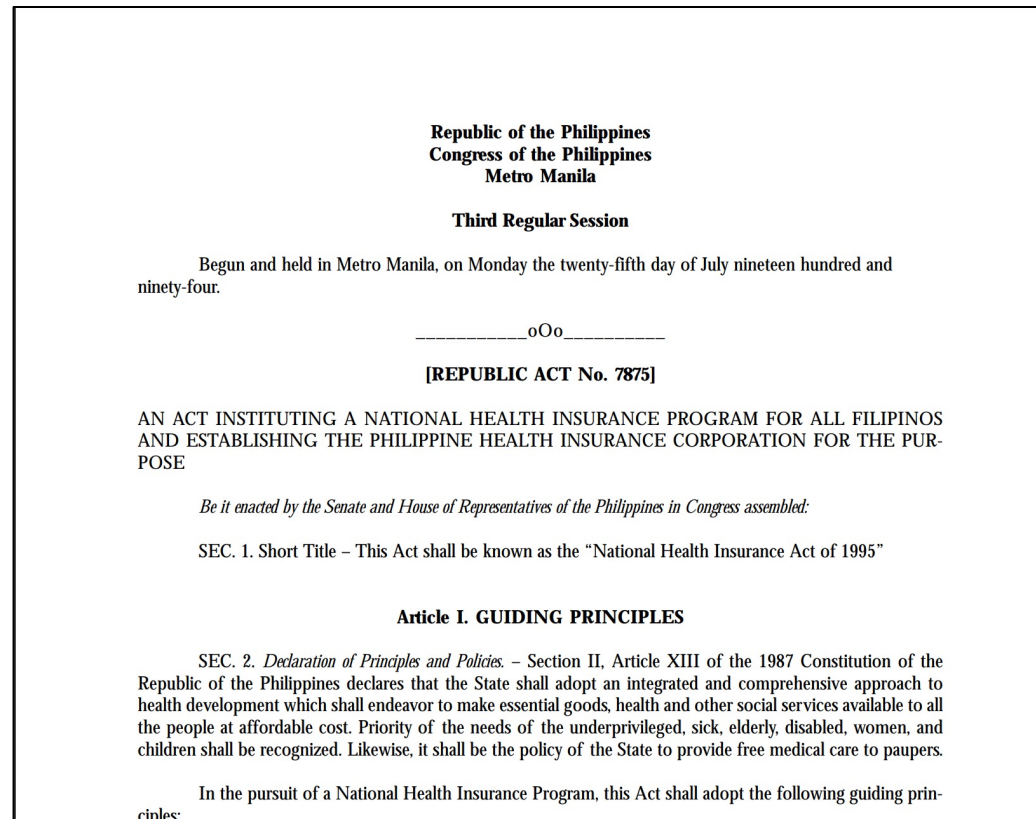# Spatiotemporal Analysis of Health Service Coverage in the Philippines

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What motivated us to do this study?

- **Knowledge gap:** Limited analysis (including the extent of disparities) of effective coverage occurs at the granular or provincial level.

- **Inform UHC reforms:** UHC is being implemented at the provincial level. Therefore, we need to examine provincial-level performance (in terms of equity and efficiency).

- **Data-driven operations**:
  - Geolocation data improved province-specific insights, enhancing precision for tailored health policies.
  - The analysis extended beyond standard descriptive methods, considering social determinants across different locations.
  - Standardizing datasets is crucial for accurately assessing national and local health systems advancing UHC goals.

What is the policy question? Why is relevant?

Republic of the Philippines
Congress of the Philippines
Metro Manila

Third Regular Session

Begun and held in Metro Manila, on Monday the twenty-fifth day of July nineteen hundred and ninety-four.

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[REPUBLIC ACT No. 7875]

AN ACT INSTITUTING A NATIONAL HEALTH INSURANCE PROGRAM FOR ALL FILIPINOS AND ESTABLISHING THE PHILIPPINE HEALTH INSURANCE CORPORATION FOR THE PUR-POSE

Be it enacted by the Senate and House of Representatives of the Philippines in Congress assembled:

SEC. 1. Short Title – This Act shall be known as the "National Health Insurance Act of 1995"

Article I. GUIDING PRINCIPLES

SEC. 2. *Declaration of Principles and Policies.* – Section II, Article XIII of the 1987 Constitution of the Republic of the Philippines declares that the State shall adopt an integrated and comprehensive approach to health development which shall endeavor to make essential goods, health and other social services available to all the people at affordable cost. Priority of the needs of the underprivileged, sick, elderly, disabled, women, and children shall be recognized. Likewise, it shall be the policy of the State to provide free medical care to paupers.

In the pursuit of a National Health Insurance Program, this Act shall adopt the following guiding principles:
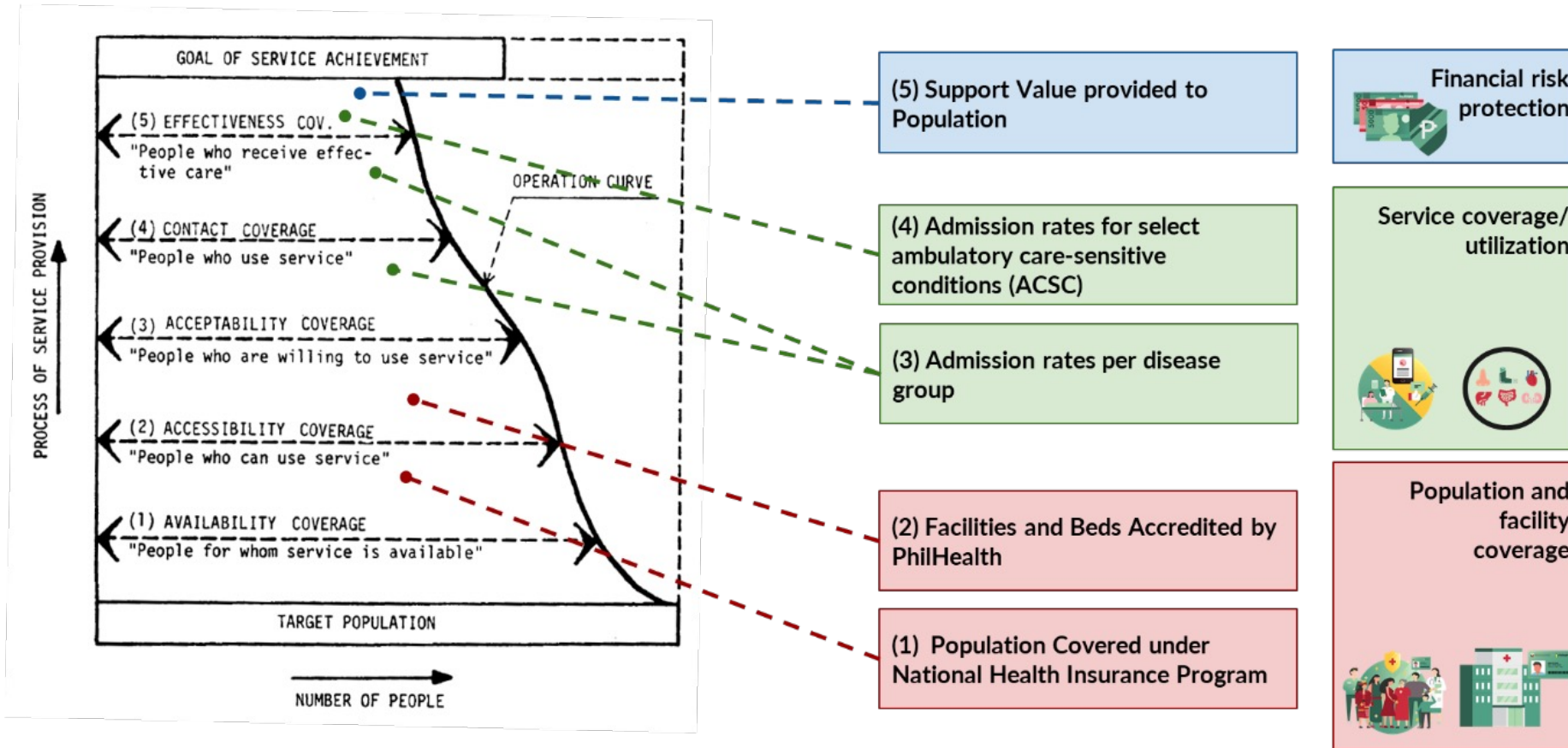
NHIP's creation strongly emphasizes addressing healthcare disparities. However, does the actual performance of NHIP align with these objectives?

Objective of the study

- We evaluate PhilHealth's healthcare service performance across three key domains:

  - **Population and facility coverage:** Focuses on the NHIP's covered population and accredited health facilities. This analysis explores the optimization of service availability and accessibility.

  - **Service coverage:** Examines admission/utilization rates across disease categories, revealing service utilization and quality efficiency based on care level.

  - **Financial risk protection**: Assesses the proportion of healthcare costs covered by NHIP, directly measuring the financial risk to the population when seeking healthcare.

Methods (1): Analytical Framework

Methods (2): Data sources

Data type	Variables included	Period covered	Source(s)
Membership data'	•member type, sex, and count •location (e.g. PhilHealth Regional Office name, province, municipality).	Annual data (2018 – 2021)	PhilHealth
Health facility data	•institution name, accreditation number, institution code, location, social sector (i.e. private, government), class (i.e. Level 1, 2 or 3 hospital, etc.), number of implementing beds and PhilHealth accredited beds	Annual data (2018 – 2021)	PhilHealth data on accredited facilities
	•accreditation year, DOH licensed or not, HCI number, accreditation number, HCI details (e.g. name, , hospital level, type, etc.), social sector (e.g. government, private), location details, number of DOH and PhilHealth accredited beds	Annual data (2018 – 2021)	DOH National Health Facility Registry (NHFR)
Electronic Insurance Claims (eClaims)	•patient characteristics •hospital and claims information such as unique identifier number for each claim filed, primary and secondary diagnosis/es in ICD-10 code, room type, year and date of admission, date the claim was received, received-refile date, date check was issued and institution code	Annual data (2018 – 2020)	PhilHealth
Philippine Standard Geographic Code (PSGC)	•Assigned code for each region, province, and municipality •LGU data (name, type, and other characteristics such as city type, income class, 2015 population count), number of barangays, urban population count •Poverty incidence at the province and municipality or city level	PSGC codes used as of September 30, 2020	PSA
Poverty Statistics	•province name, poverty cluster , poverty incidence rates, and 90 percent confidence interval values.	Annual data from 2018 to 2021	PSA
Global Burden of Disease (GBD) Grouping	•International Classification of Diseases (ICD) codes mapped to the GBD cause list •cause/disease description and ICD codes	N/A	IHME

Method (3): Data processing

PhilHealth data
- Membership
- Accredited facilities
- eClaims

$+$

Department of Health data
- National Health Facility Registry (NHFR)

$+$

PSA data
- Census on Population and Housing (CPH)
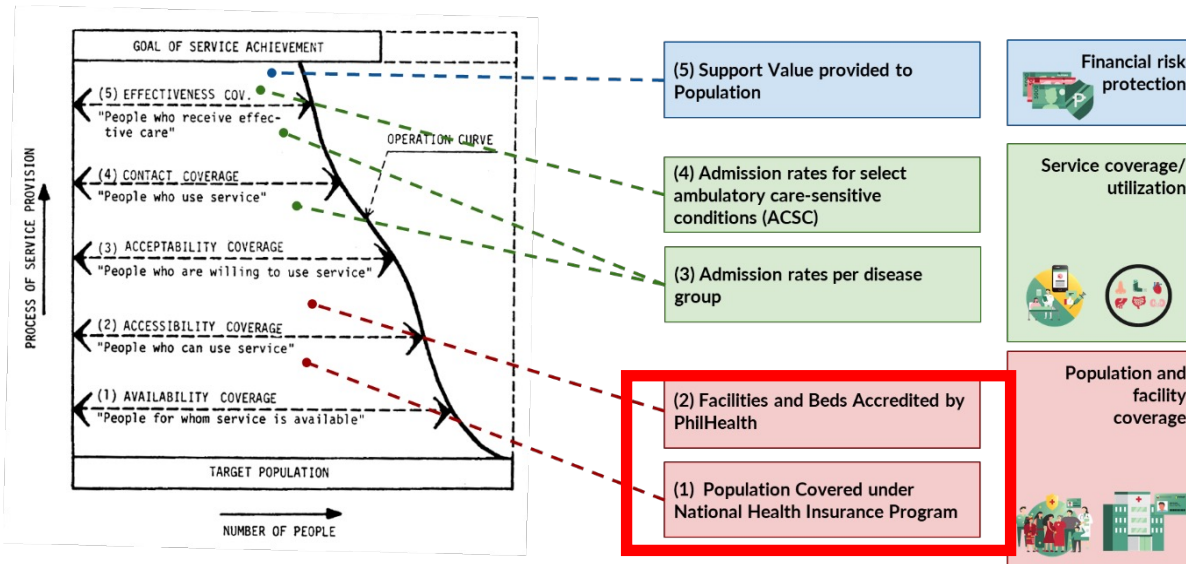- Philippine Standard Geographic Code (PSGC)
- Poverty Statistics

$+$

IHME Global Burden of Disease data
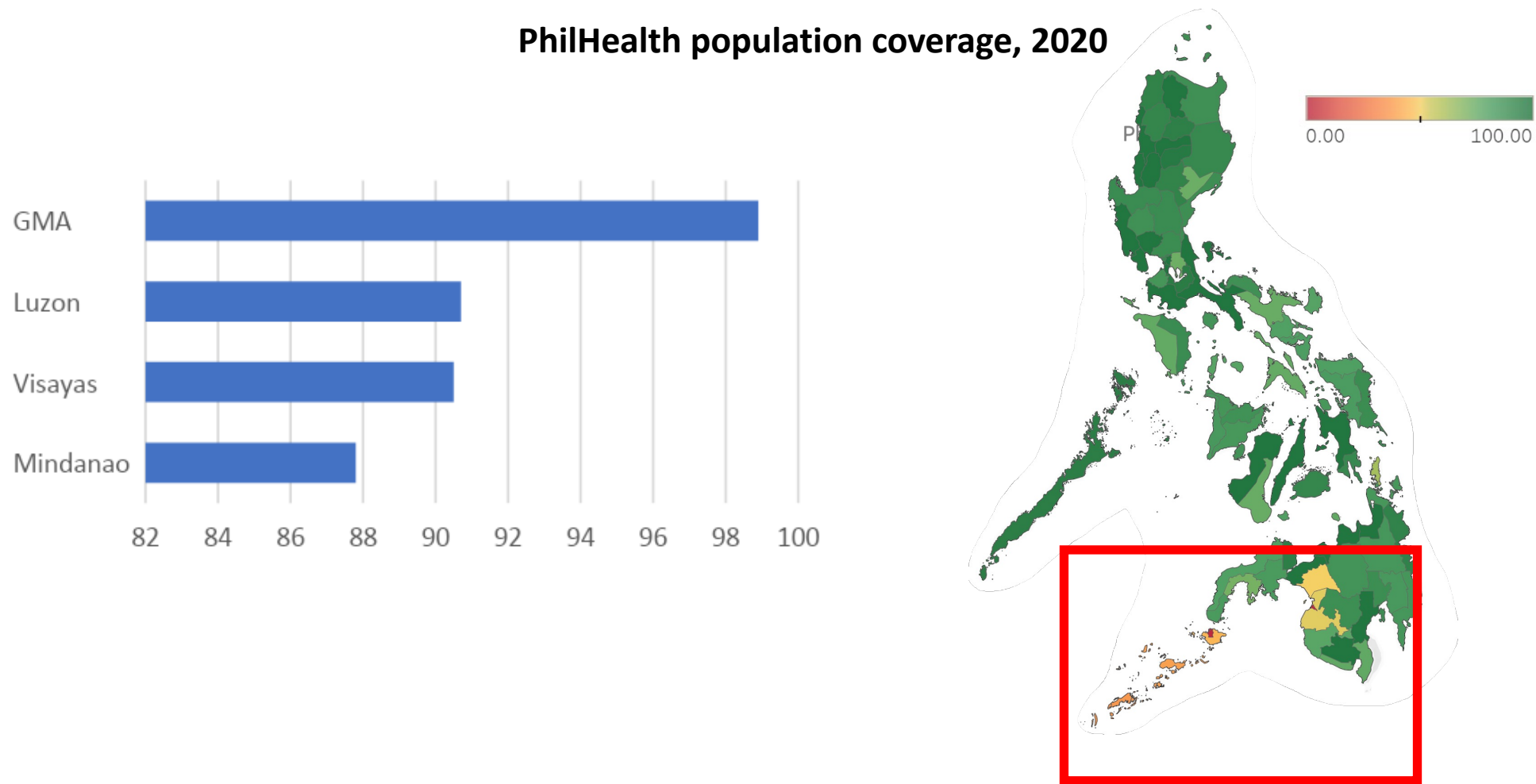- Disease grouping

Results: Access and availability coverage

- **Data Analysis Scope:** Examined membership and accredited facilities across provinces, focusing on inpatient services data due to limited outpatient and primary care information.

- **Coverage Metrics:** Evaluated population coverage (PhilHealth beneficiaries as a proportion of the province population) and facility coverage.

- **Equity and Correlation Analysis:** Investigated the relationship between population coverage, facility coverage, and poverty incidence per province, considering various subgroup characteristics.
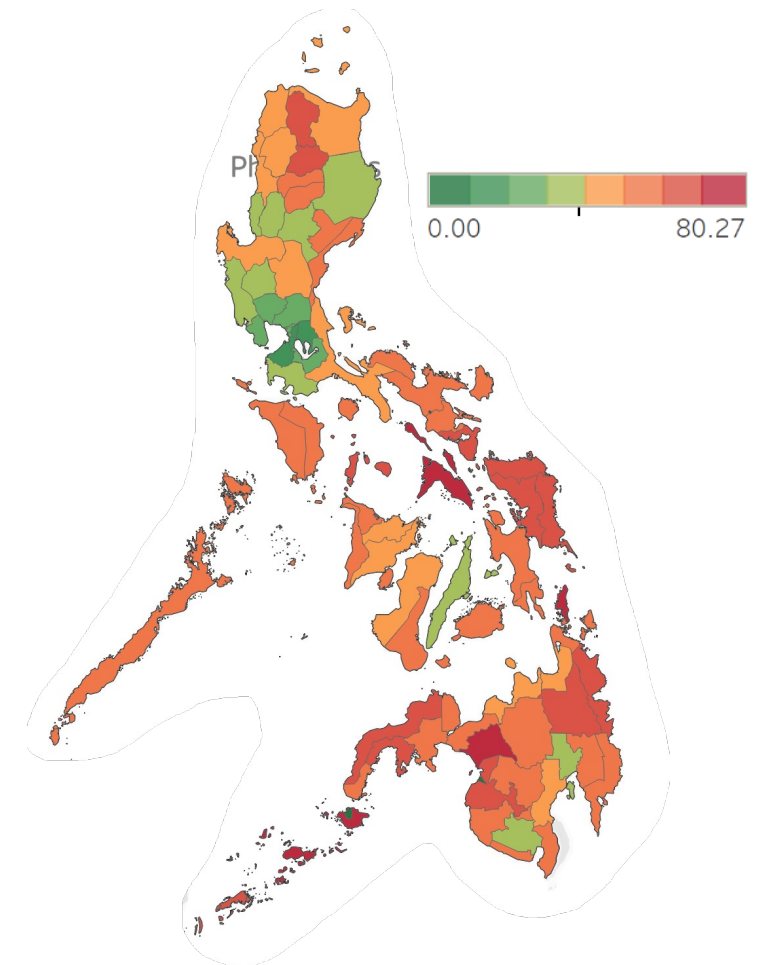
In 2020, UHC Law Achieved Near-Universal PhilHealth Coverage in the Philippines, Yet Mindanao's Conflict-Affected Provinces Lagging at Less than 50%.

PhilHealth population coverage, 2020

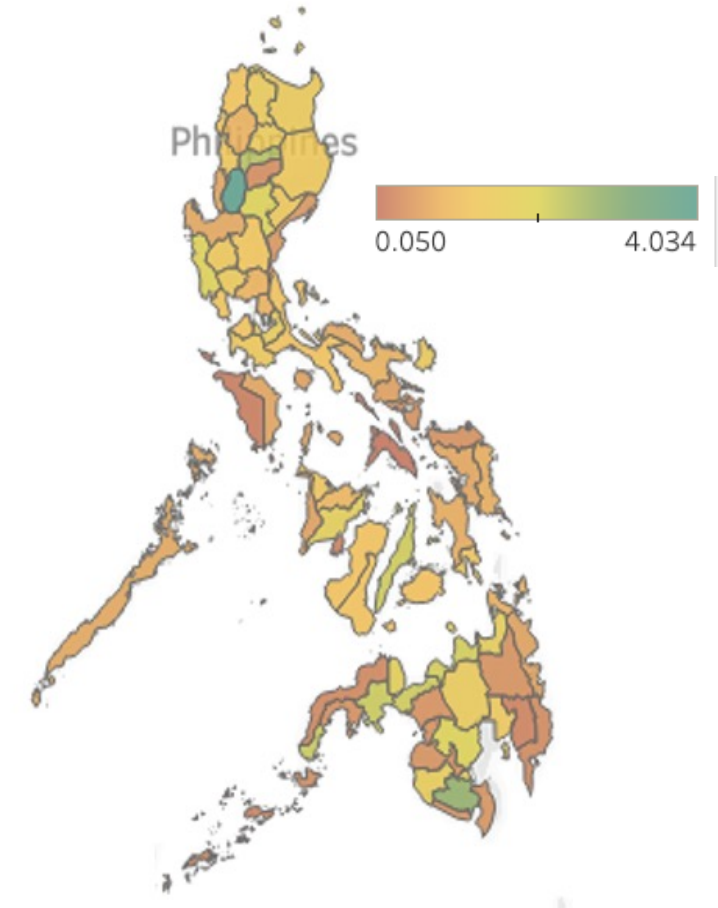# High Proportion of Direct Contributors in Greater Manila Area, While Indirect Contributors Predominate in Mindanao.

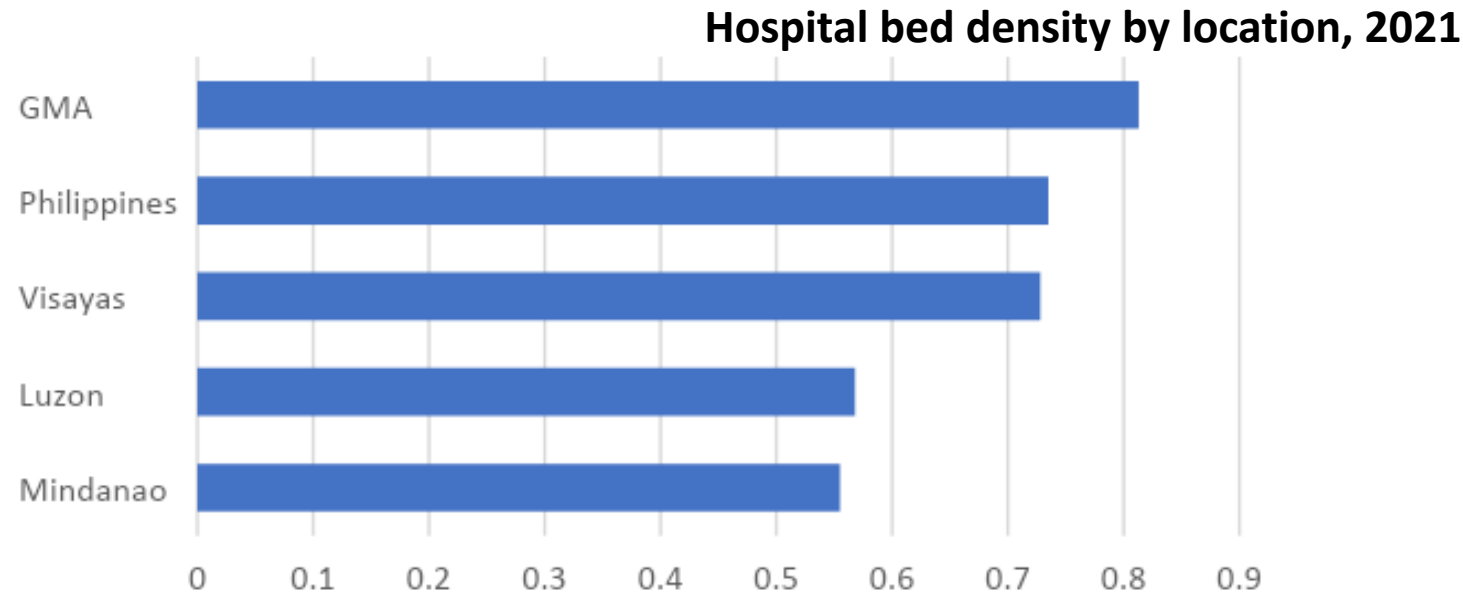**Share of indirect contributors to total registered members, 2020**

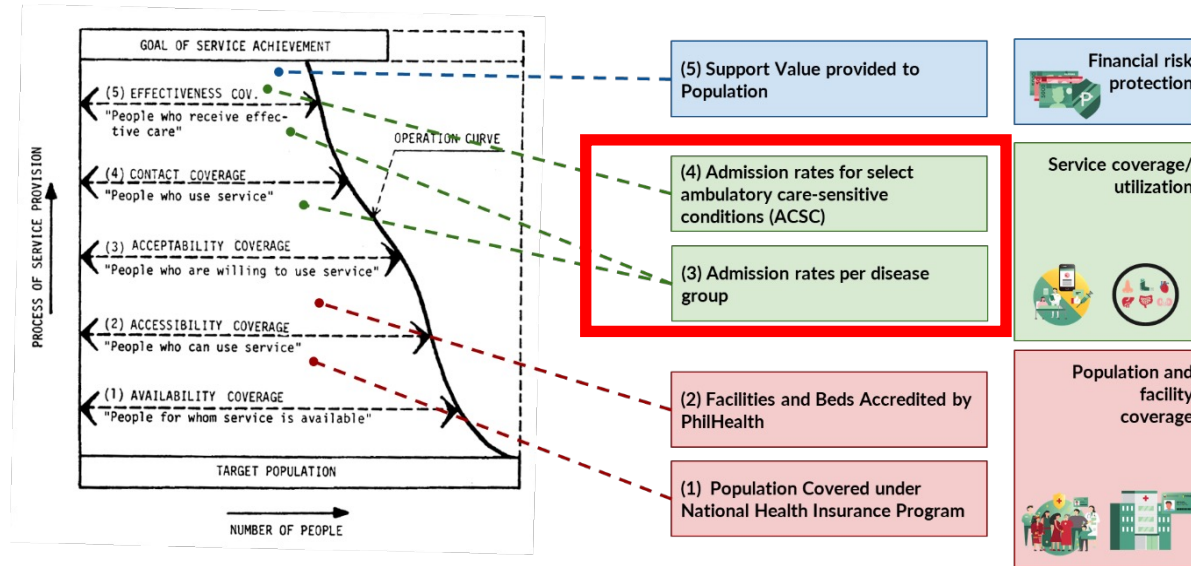|	All members	Direct contributor (%)			Indirect contributor (%)	
		Formal	Informal	Lifetime Paid	Senior Citizen	Indigent/ Sponsored
Philippines	100	27.0	17.5	2.3	11.4	35.8
GMA	100	39.3	21.5	2.3	11.9	16.5
Luzon	100	23.0	17.5	2.3	12.7	38.1
Visayas	100	23.8	16.2	2.5	12.3	40.4
Mindanao	100	22.0	14.8	2.0	8.6	48.5

•Indigent/sponsored members make up over 60 percent of the population in provinces like Sulu, Masbate, Lanao del Sur, Basilan, Tawi-Tawi, and Zamboanga del Norte, resulting in the majority of members being indirect contributors.

•Furthermore, there's an inverse relationship between population coverage and poverty incidence, with a coefficient of -0.4183, an R-squared value of 0.3304, and a statistically significant P-value of <0.0001.

Philippines

0.00   80.27

Geographical Disparities in Hospital Bed Density in the Philippines: A Nationwide Challenge Highlighting Access and Utilization Inequities.

Hospital bed density by location, 2021

- Disparities in hospital bed density reveal accessibility issues, particularly in Mindanao, with many provinces below one bed per population.
- Provinces with densities below 0.5 per 1,000, primarily in Mindanao, need more accredited beds and hospitals, especially for vulnerable subpopulations.
- Inequitable health service access is seen across locations and hospital characteristics. Privately owned Level 2 and 3 hospitals have higher bed densities than government-owned ones. GMA and Mindanao hospitals generally have higher bed densities, except for Level 1 government-owned hospitals in Mindanao.
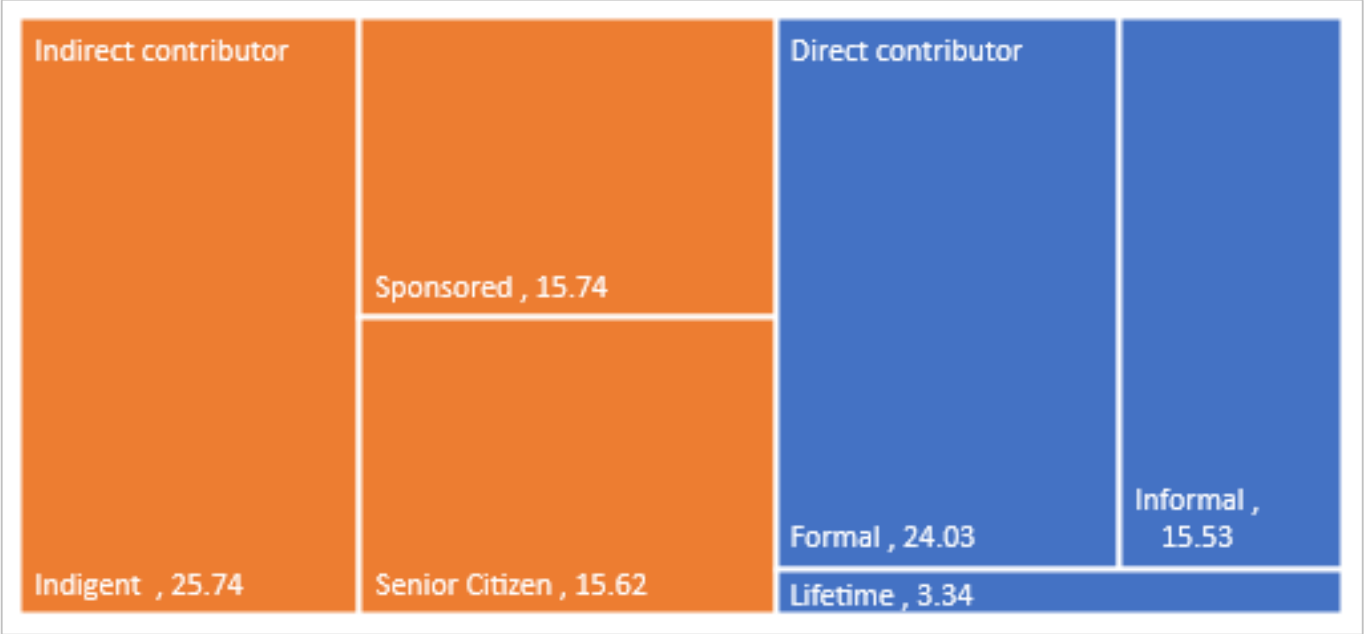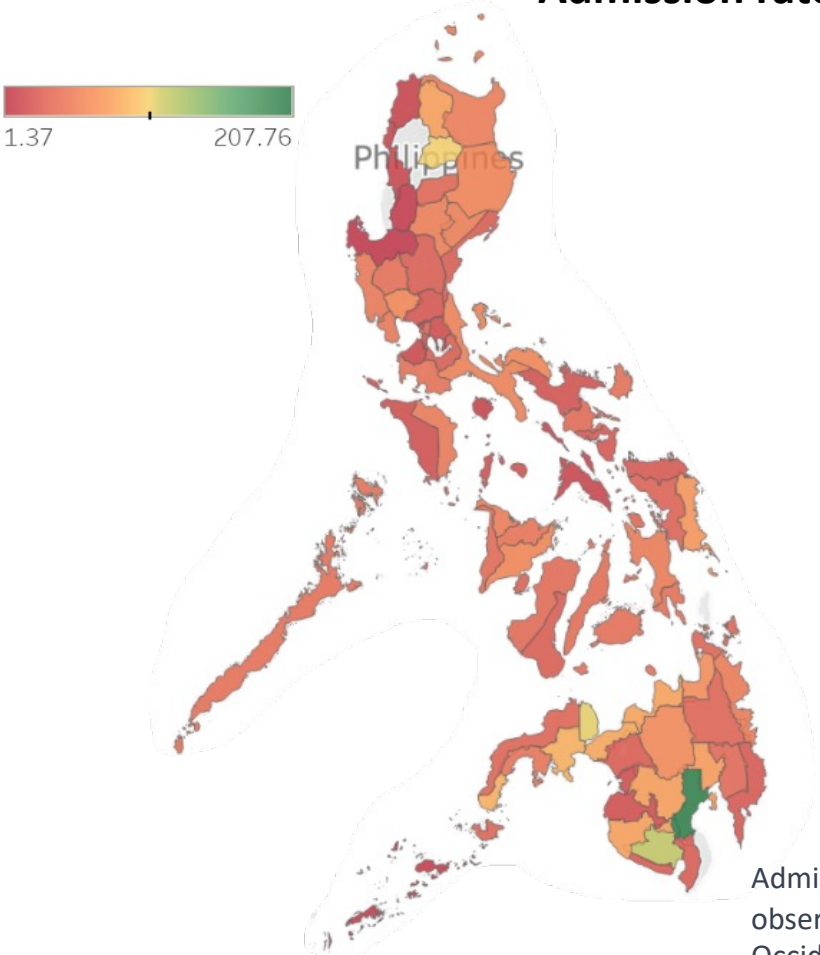
Results: Contact coverage

- **Data Analysis Scope:** The study involved in-depth data analysis, focusing on primary diagnosis using ICD-10 codes, GBD groupings, and ambulatory-care sensitive conditions (ACSC).

- **Coverage Metrics:** Utilization rates were calculated by comparing the number of claims to the provincial population, and admission rates for specific conditions, such as NCDs, were examined.

- **Equity and Correlation Analysis**: The study explored equity and correlation, particularly regarding population coverage, facility coverage, and poverty incidence per province, shedding light on potential disparities in healthcare access and affordability.

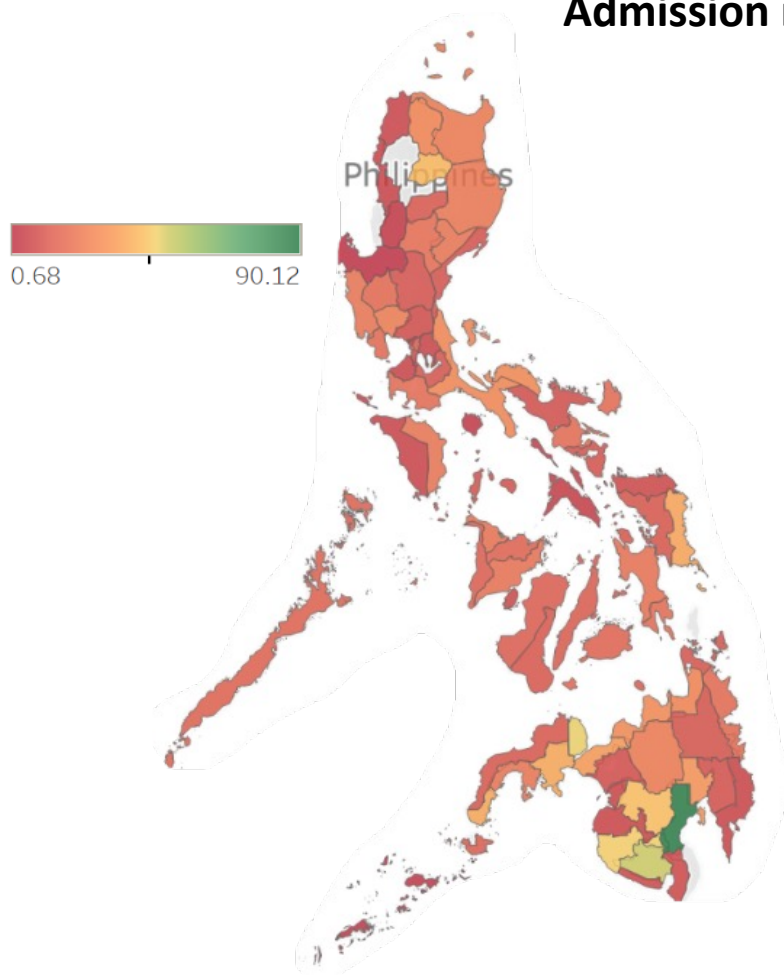# Significant Variation in Admission Rates Across Provinces in the Philippines.

Admission rates (per 1,000 population) in each province, 2020

1.37   207.76

Indirect contributor		Direct contributor	
	Sponsored , 15.74		Informal , 15.53
Indigent , 25.74	Senior Citizen , 15.62	Formal , 24.03	
		Lifetime , 3.34	

Admission rates per 1,000 population vary significantly among provinces (Figure 16), with the highest rates observed in Mindanao, such as Davao del Norte (207.76), South Cotabato (119.69), and Misamis Occidental (107.35)

Widespread High NCD Admission Rates, Especially in Mindanao, with Concerning Impact on Young and Middle-Aged Adults

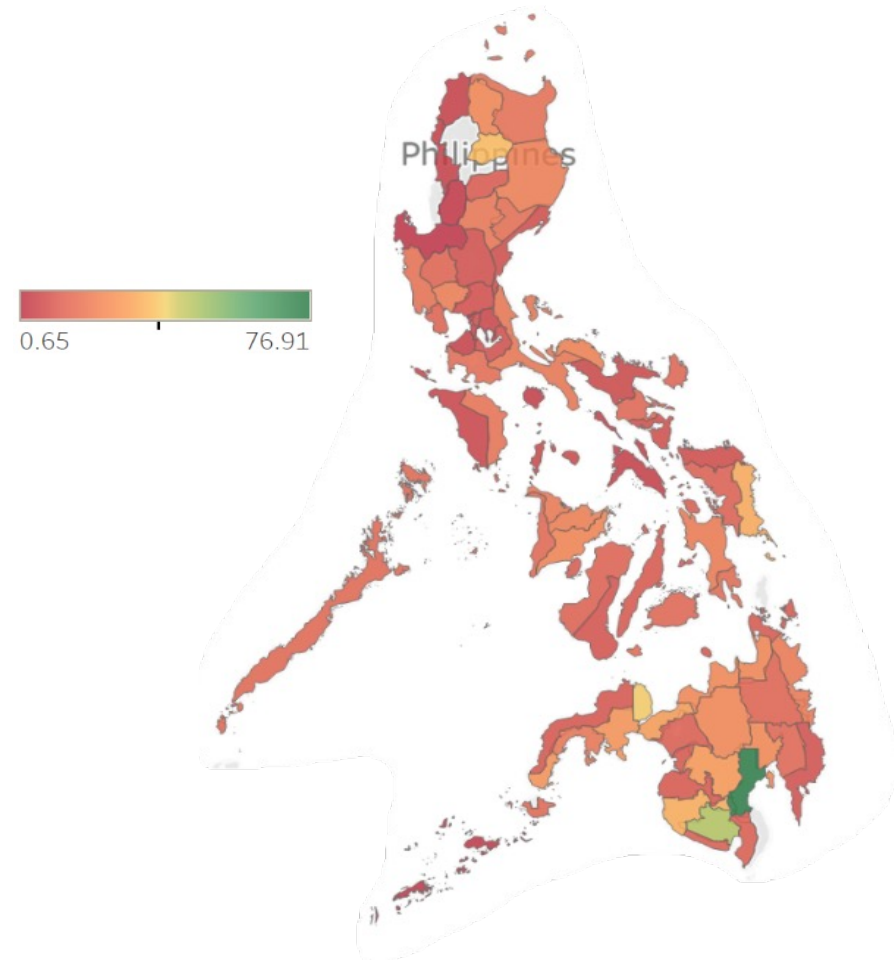**Admission rates for NCDs (per 1,000 population) in each province**

	Admission rate (per 1,000)	Share to Total Number of Claims (%)
0-4 years	4.43	10.87
5-19 years	4.94	12.12
20-59 years	16.72	41.03
60 years and above	14.66	35.98

High NCD admission rates, especially in Mindanao, indicate the widespread prevalence of NCDs nationwide. Quezon and Camarines Norte in Luzon also had NCD admission rates exceeding 25 per 1,000 population.

Widespread ACSC Admission Rates in the Philippines Point to Health System Challenges, With Concentrated Impact in Mindanao and Vulnerable Provinces; suggesting poor PHC.
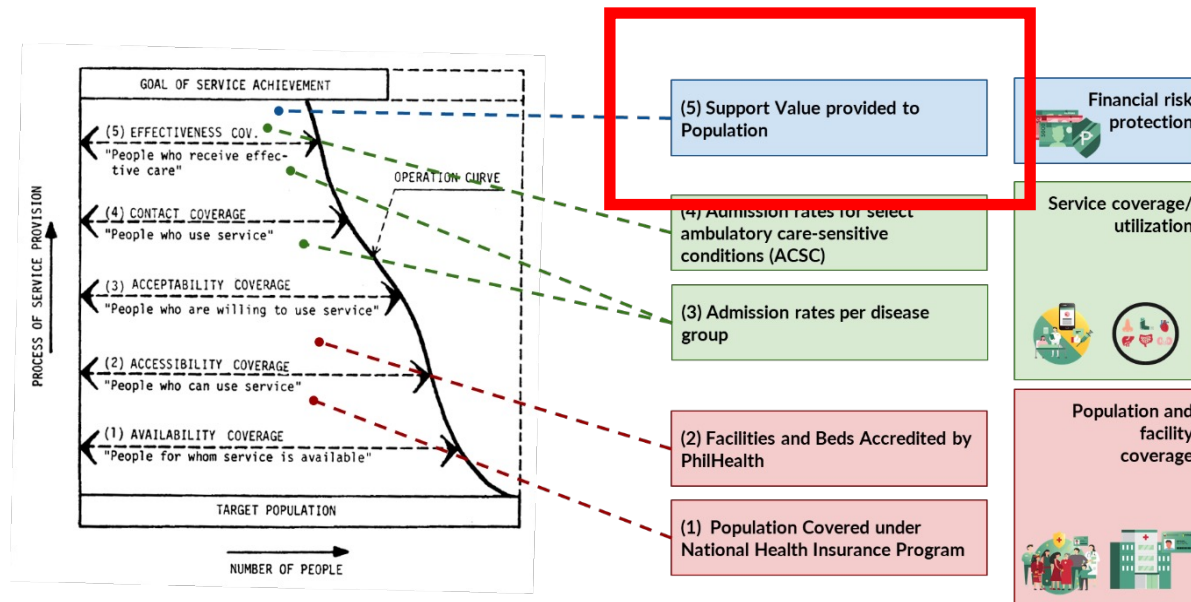
•**High ACSC Rates:** About 33.61% of admission rates fall under Ambulatory-Care Sensitive Conditions (ACSC), potentially avoiding nearly one-third of these cases through more efficient Primary Healthcare (PHC).

•**Geographical disparities:** Provinces in Mindanao, including Cotabato, South Cotabato, Lanao del Norte, Misamis Occidental, Sultan Kudarat, and Zamboanga del Sur, along with Eastern Samar in Visayas and Kalinga in Luzon, exhibit ACSC admission rates exceeding 25 per 1,000 population. These disparities may arise from greater accessibility to hospitals than PHC providers, resulting in higher demand for hospital services in regions with limited healthcare facility access.
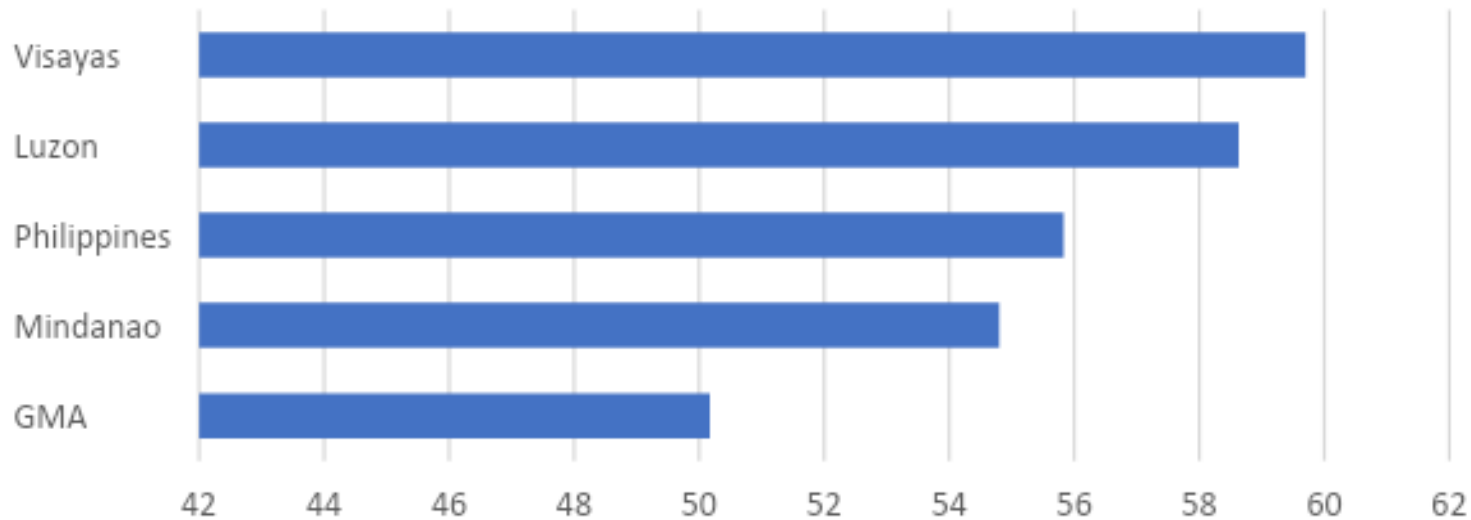
Results: Effective Coverage (e.g., Financial Protection)

- **Objective:** Estimate the support value offered by the National Health Insurance Program (NHIP) in the context of effective financial protection within the healthcare system.
- **Financial Protection Focus:** The primary goal is to reduce out-of-pocket (OOP) patient costs not covered by insurance to the greatest extent possible.
- **Support Value Definition:** Support value is determined as the total cost covered by the national health insurance, calculated as a proportion of the total hospital charges for services (according to Equation 3).
- **Scope of Analysis:** The analysis is conducted at multiple levels, including the provincial level, and it is further stratified by membership category and disease groupings.

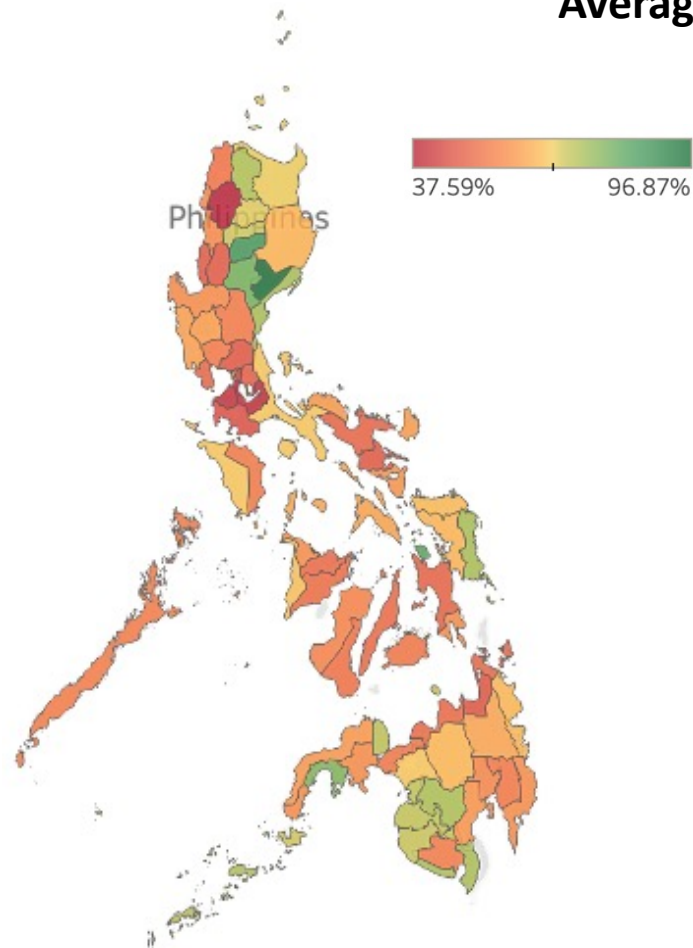# NHIP Provides 60% Coverage of Hospital Charges, with significant variation.

Average support value by location, 2018 -2021

	Government	Private
Direct Contributors	66.41	44.45
Formal	69.35	45.56
Informal	67.25	47.11
Lifetime	62.61	40.69
Indirect Contributors	64.53	49.54
Indigent	65.59	56.53
Senior Citizen	63.12	41.84
Sponsored	64.87	50.24

Disparities in Support Value and High Out-of-Pocket Costs Highlight the Urgency of Strategic Healthcare Reforms in the Philippines.

Average support value by province and disease, 2018 - 2021

37.59%   96.87%

Top 15 GBD subgroups	Total adjusted claims amount (billion PHP)	Total adjusted claims charge (billion PHP)	Average support value (%)
Lower respiratory tract infection	21.8	44.54	48.93
Maternal and child care	7.57	16.96	44.63
Dengue	7.34	16.2	45.32
Neonatal disorders	6.68	14.61	45.73
Stroke*	6.33	11.83	53.52
Urinary diseases and male infertility	5.82	14.2	41
Diarrheal diseases	5.6	9.88	43.57
Primary hypertension*	5.05	9.08	43.28
Chronic kidney disease*	3.74	8.27	39.61
Upper digestive system disorders	3.07	7.22	42.58
Ischemic heart disease*	2.65	7.03	37.73
Asthma*	2.41	5.22	46.05
Other cardiovascular and circulatory diseases*	2.16	5.32	40.54
Diabetes Mellitus*	1.83	5.01	36.5
Maternal disorders	1.71	4.02	42.5

Summary/key insights

- Access and availability coverage

- Contact coverage

- Effective coverage

Key Policy Areas for Recommendations

- Enhancing Data for Informed Policy and Operations

- Addressing Supply Challenges to Reduce Disparities

- Boosting Demand by Tailoring Services to Health Needs Enhancing Efficiency, Such as Through Primary Health Care, to Minimize Hospital-Centric and Unnecessary Admissions

- Implementing Strategic Purchasing to reduce OOP

Thank you!