

The Impact of the COVID-19 Pandemic on Social Health Insurance Claims for High-Burden Diseases in the Philippines

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Abstract

In the Philippines, anecdotes on the dwindling use of essential healthcare services as an indirect consequence of the COVID-19 pandemic are mounting, but compelling evidence remains scarce. In this study, we examined the magnitude of decline in insurance claims of twelve (12) high-burden diseases and five (5) common procedures from 1,286 public and private hospitals. From March to September 2020, seasonally adjusted insurance claims for high-burden diseases declined by almost 60 percent compared to the previous year. In contrast, change in insurance claims for procedures vary across hospital type, level, and ownership. We observed a 30 percent decline in claims for procedures in publicly owned end referral hospitals but with modest growth in lower-level hospitals. Less urgent procedures such as cataract surgery suffered a huge decline relative to chemotherapy, vaginal delivery, and cesarean sections. Governments must address the needs of both COVID and non-COVID patients to reduce the total harm caused by the pandemic.

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Foreword

On March 11, 2020, the World Health Organization declared COVID-19 a global pandemic. With dire predictions about how the virus could devastate populations and overwhelm health systems, many countries imposed stringent measures to limit spread and the resulting morbidity and mortality. Yet most of these policy approaches focused narrowly on potential impacts for COVID-19, without sufficient attention to how the pandemic and various response measures would have broader indirect impacts across other health needs and health services. While the evidence of disruptions to essential health services was largely anecdotal to begin with, and its health effects mostly modeled, increasingly detailed evidence is beginning to emerge from countries.

Over the past year we partnered with research institutions in Kenya, the Philippines, South Africa, and Uganda to document, from a whole-of-health perspective, what we know about the nature, scale, and scope of the disruptions to essential health services in those countries, and the health effects of such disruptions. This research provides initial insights on the observed near-term indirect health impacts of the pandemic and response measures, relying on the best available data in the months following lockdown measures. However, it is important to recognize the limitations of conducting research during a pandemic and a continuously evolving epidemiological and policy context. We plan to build on these studies as more and better data become available, and as public health responses continue until the pandemic is brought under control.

In this paper, Valerie Gilbert Ulep, Anton Paterno, Jhanna Uy, Vanessa Siy Van, Lyle Casas, and Justin Tan present findings on the impact of the COVID-19 pandemic on social health insurance claims for high-burden diseases in the Philippines. Worryingly, the authors found that from March to September 2020, seasonally adjusted insurance claims for 12 high-burden diseases declined by almost 60 percent compared to the previous year. Health insurance claims data like what was analyzed in this report from the Philippine Health Insurance Corporation (or PhilHealth) provide an opportunity to measure the indirect health impact of the pandemic. Repeat analyses of the data over time can help show how successful efforts to mitigate these effects are.

We are hopeful that the findings from this working paper—and the project as a whole—will contribute to our global knowledge about the ongoing and lingering effects of the pandemic, and ways to mitigate these effects. It is not too late for action. Armed with the kind of evidence in this working paper, national governments and global partners must focus their efforts on the most affected, most cost-effective services, and ensure that any lost generations due to the pandemic are minimized.

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1. Introduction

As COVID-19 continues to spread, governments are focused on tracking and managing COVID-19 cases and deaths. However, these numbers fail to capture the broader health impacts of the pandemic. In many low- and middle-income countries (LMICs) where health information and vital registry systems are relatively weak, the spillover health effects of the pandemic are seldom measured (Robertson, et al., 2020; Mikkelsen, Phillips, AbouZahr, & Setel, 2015).

The Philippines has been severely affected by the pandemic. As of April 4, 2021, the country recorded 800,000 confirmed COVID 19 cases and 13,000 deaths (Department of Health, 2021). However, behind these numbers is the growing burden of non-COVID illnesses. Several reports have suggested the declining use of essential healthcare services and deteriorating health status and well-being (UNDP and UNICEF, 2020; Egger , et al., 2021; Shapira, et al., 2020). The declining use of healthcare services could be attributed to a variety of reasons. Non-COVID 19 patients are foregoing hospitalization and life-saving procedures because of limited hospital resources. Hospitals are reducing healthcare services to re-allocate resources to accommodate COVID-19 cases. Patients are reducing clinic visits because of mobility restrictions or fear of getting infected. The country has remained under different levels of lockdowns since March 2020. Senior citizens, patients with comorbidities, and children are prohibited from leaving their homes unless necessary. All school levels have remained closed.

A better understanding of the direct and indirect health consequences of the pandemic would allow decision-makers to implement a more holistic and calibrated public health response. For this reason, we assess the extent and duration of changes in the use of essential health services in the Philippines. We analyzed the health insurance claims data from the Philippine Health Insurance Corporation or PhilHealth. We obtained monthly insurance claims of twelve (12) high burden diseases and the five (5) most common procedures from January 2018 to September 2020. These twelve (12) diseases account for about 50% of the total disease burden of the country (Institute for Health Metrics and Evaluation, 2021).

2. Methods

Context and data

PhilHealth is the primary government agency implementing the country's universal healthcare (UHC) program. It was established to provide health insurance coverage for all Filipinos. It is funded primarily through premiums from members and general taxation. PhilHealth is responsible for collecting premiums, establishing benefit packages, processing claims from hospitals and primary care facilities (Querri, et al., 2018). While all Filipinos are automatically enrolled in PhilHealth as mandated by the UHC Act *of 2019*, 85% of 110 million Filipinos are currently listed in the national health insurance database (Philippine

Health Insurance Corporation, 2020). Ninety-three percent (93%) of hospitals are accredited by PhilHealth.

We requested PhilHealth to extract the monthly insurance claims of 1,286 public and private hospitals from 2018 to 2020. We included both paid and denied inpatient insurance claims. While we have access to monthly data from January 2018 to December 2020, we decided to exclude insurance claims data from October until December 2020 in our analysis. Data from the fourth quarter of 2020 might not be complete because of possible delays in the submission of reimbursements from hospitals.

Hospitals in the Philippines are categorized based on capacity or level of care. Level 1 hospitals provide emergency care and treatment with general ancillary services. Level 2 hospitals, in addition to level 1 requirements, are departmentalized and have intensive care units (ICU), respiratory therapy services, and a clinical laboratory. Level 3 hospitals, on top of levels 1 and 2 requirements, are teaching and training hospitals with accredited residency training programs; they are considered as end-referral hospitals (Department of Health, 2021).

PhilHealth pays inpatient hospitals using bundled case rates, which is a fixed rate that PhilHealth reimburse for a specific illness. It covers professional fees and all facility charges including drugs, diagnostics, and supplies. Each medical claim has a corresponding ICD10 code and a Relative Value Scale (RVS) for a procedure claim. RVS is a systematic listing or coding of surgical procedures (PhilHealth Circular no. 3; 2013) (**Appendix A**).

The data includes insurance claims of individual hospitals capturing 12 diseases and five (5) common procedures. Medical claims cover the following diseases: acute gastroenteritis, asthma, chronic kidney disease, chronic obstructive pulmonary disease, cancer, dengue, diabetes, hypertension, ischemic heart disease, pneumonia, stroke, and tuberculosis. Procedure claims include the following: chemotherapy, vaginal delivery, cataract surgery, hemodialysis, and cesarean section.

To supplement our analysis, we added monthly provincial socio-economic indicator from the Philippine Statistical Authority (PSA) in our insurance claims data. We assessed the extent of decline in insurance claims in poor provinces relative to rich provinces.

Statistical analysis

We started our analysis by adjusting the monthly insurance claims for seasonality. Following the method of Birkmeyer et al (2020), we used a corresponding month in 2019 as our control. We created a baseline adjustment factor by calculating the ratio of the average claims in January and February 2019 and the average claims for the same months in 2020. Secondly, we calculated the adjusted ratio by multiplying the baseline adjustment factor with the 2019 and 2020 claims ratio for each month. The inverse of the adjusted ratio is interpreted as the percentage change decline. Finally, we estimated the adjusted 2020 claims by multiplying the adjusted ratio with the 2019 monthly claims.

We disaggregated our analysis by type of claim, disease, and the following hospital characteristics: hospital level, ownership, provincial socio-economic status, and region. For the socio-economic status, we categorized provinces into socio-economic quintiles based on 2018 poverty incidence from PSA (Philippine Statistical Authority, 2021). We used STATA 16.0 for data processing and analysis.

3. Results

Table 1 shows the distribution of hospitals and insurance claims. The majority of hospitals are classified as level 1, but levels 2 and 3 hospitals account for about 70% of total beds in the country (Department of Health, 2021). The majority (62%) of hospitals are located in the top 40% richest provinces (first and second socio-economic quintile). Most hospitals are concentrated in a few regions in the country. About 45% of hospitals are located in three contiguous regions—National Capital Region (Metro Manila), Region III, and Region IVA. These regions are considered the epicenter of economic activity, which account for about 60% of the country’s Gross Domestic Product (GDP) (Philippine Statistical Authority, 2021). The three regions are highly dense in terms of population size (see Figure 1).

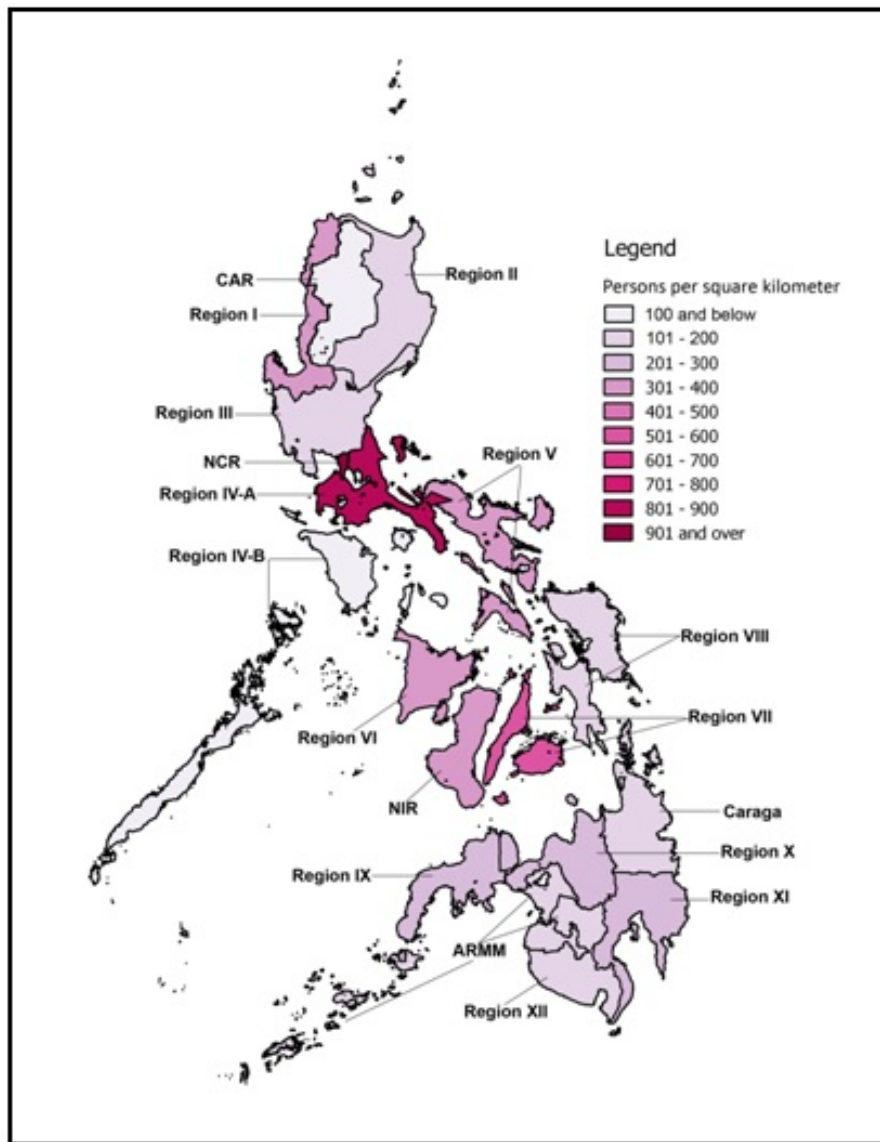
Table 1. Descriptive statistics

Categories		Number of hospitals		Number of claims (2018-2020*) in millions
		Frequency	%	
Total		1,286		12.4
Level	Level 1	824	64%	3.9
	Level 2	343	27%	5.0
	Level 3	119	9%	3.6
Ownership	Public	438	34%	4.3
	Private	848	66%	8.1
Ownership and level	Level 1 – Public	340	26%	1.9
	Level 2 – Public	42	3%	0.7
	Level 3 – Public	56	4%	1.7
	Level 1 – Private	484	38%	1.9
	Level 2 – Private	301	23%	4.3
	Level 3 – Private	63	5%	1.9
Provincial socio-economic status	First	505	39%	5.1
	Second	301	23%	3.0
	Third	216	17%	2.1
	Fourth	185	14%	1.6
	Fifth	79	6%	0.5
Region	Ilocos	80	6%	0.7
	Cagayan Valley	64	5%	0.4
	Central Luzon	175	14%	1.9
	CALABARZON	226	18%	1.9
	Bicol	56	4%	0.4
	West Visayas	64	5%	0.9
	Central Visayas	60	5%	0.9
	East Visayas	51	4%	0.4
	Z. Peninsula	39	3%	0.4

North Mindanao	72	6%	0.7
Davao	59	5%	0.5
SOCCKSARGEN	70	5%	0.6
NCR (Capital)	161	13%	1.8
CAR	28	2%	0.3
ARMM	28	2%	0.1
CARAGA	23	2%	0.2
MIMAROPA	30	2%	0.2

Note: excluded October-December 2020

Figure 1. Philippine map



Source: Philippine Statistical Authority

We observed a large decline in insurance claims for high-burden disease during the pandemic period. PhilHealth received 1.5 and 1.7 million insurance claims for the 12 diseases during the first and third quarters of 2018 and 2019. However, in 2020, it went down to 800,000 claims. Procedure claims remained relatively stable in the last three years. PhilHealth received 1.8 and 2.0 million for the first and third quarters of 2018 and 2019, In 2020, it increased to 2.2 million.

Figure 2 shows the seasonally adjusted monthly medical and procedure claims. For medical claims, we observed a large decline during the pandemic. The lowest number of claims was recorded in April 2020, which coincided with the peak of the first national lockdown. We observed a modest recovery in May 2020, but it stagnated until the third quarter of 2020. The average change for March to September 2020 was 57% compared to the same period or months in the previous year. In March 2020, insurance claims for 12 high-burden diseases declined by 27%, and during the peak of the first lockdown in April 2020 insurance claims declined by 62%. We observed a lower decline at 56 %and 53% in May and June 2020, respectively. In August 2020, the medical claims declined again by 67%. This coincides with the “second wave” of infection. Tighter restriction was imposed during that month. The decline in insurance claims for the 12 diseases remained relatively low during pandemic period and no signs of recovery until the third quarter of 2020. For procedure claims, at least on aggregate, we observed stable insurance claims. The average change for March to September 2020 was 2% compared to the same period or months in the previous year. In March 2020, insurance claims for procedure declined by 3%, and during the peak of the lockdown in April and May 2020, it declined to 8% to 9%, respectively. A modest decline and recovery followed then after.

Figure 2. Total medical and procedural claims (seasonally adjusted), in thousands

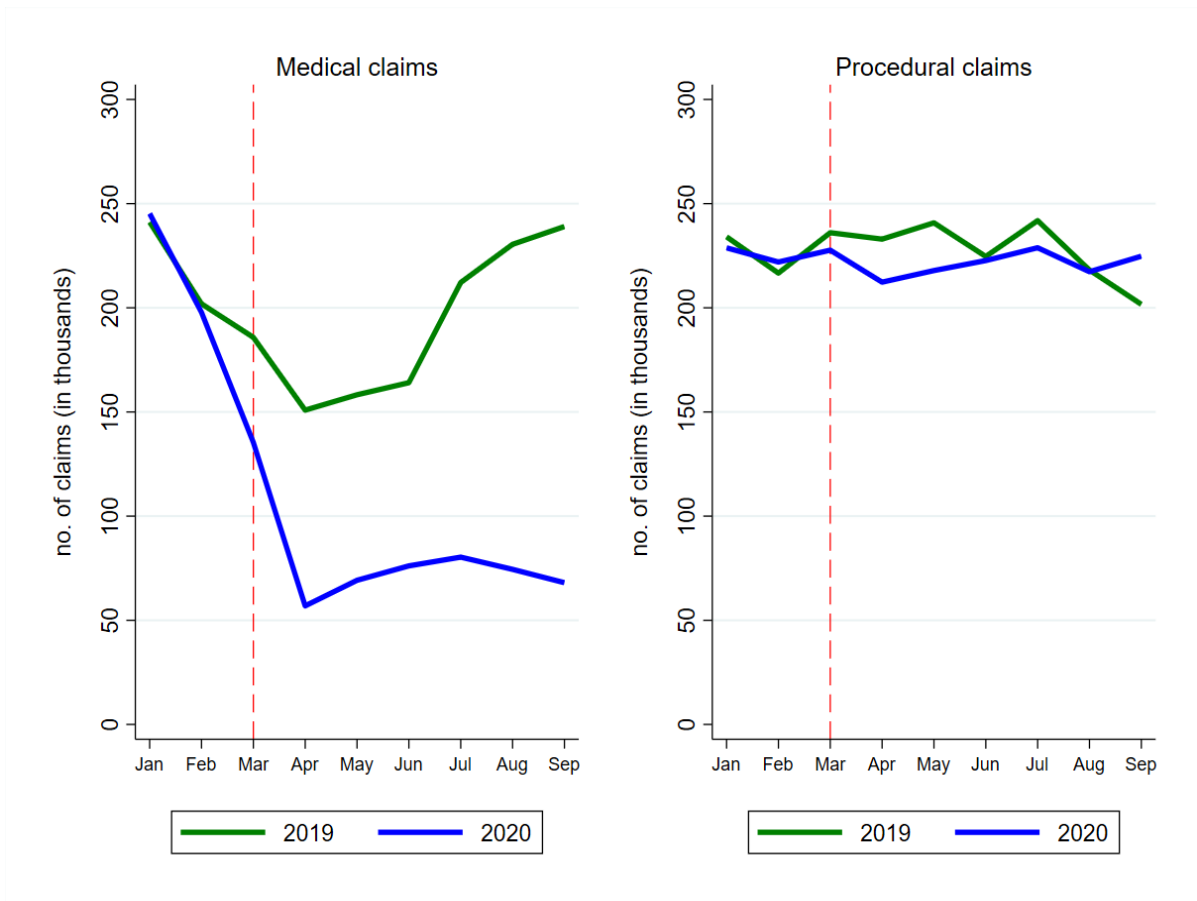


Table 3 shows medical and procedure claims by hospital characteristics. Medical claims declined in all hospitals during the pandemic regardless of level. The largest decline was recorded in higher-level or end-referral hospitals (level 3) with an average decline of 65%. Both public and private hospitals experienced similar levels of decline regardless of the socio-economic status of the province they are in. Poor and rich provinces experienced more or less similar levels of decline in insurance claims. Three (3) Philippine regions recorded the largest decline in insurance claims: Region IV-A, Central Visayas, and National Capital Region.

In contrast to medical claims in which we observed broad-based decline, change in procedure claims during the pandemic have a large heterogeneity. While level 3 public hospitals suffered almost a 30% decline in procedure claims, levels 1 and 2 public and private hospitals recorded a modest positive growth in procedure claims with private hospitals recording larger increase than public. Unlike public hospitals, level 3 private hospitals recorded one percent (1%) growth.

Table 3. Total medical and procedure claims, by hospital characteristics

	Categories	Medical		Procedural	
		No. of claims at baseline (March to September 2019)	Change (%)	No. of claims at baseline (March to September 2019)	Change (%)
Level	Level 1	650,263	-55.2%	281,407	4.5%
	Level 2	424,662	-56.7%	725,305	1.9%
	Level 3	265,717	-62.6%	589,338	-12.1%
Ownership and level	Level 1 – Public	377,829	-59.8%	103,392	1.3%
	Level 2 – Public	101,470	-62.1%	69,851	-4.5%
	Level 3 – Public	157,595	-62.4%	260,172	-27.2%
	Level 1 – Private	272,434	-48.4%	178,015	6.5%
	Level 2 – Private	323,192	-55.0%	655,454	2.6%
	Level 3 – Private	108,122	-62.9%	329,166	0.6%
Provincial socio-economic status	First	396,536	-62.2%	790,288	-1.3%
	Second	341,138	-58.2%	389,613	-7.8%
	Third	270,049	-51.8%	226,898	-5.7%
	Fourth	234,852	-54.3%	152,816	8.7%
	Fifth	98,067	-51.8%	36,435	-0.2%
Region	Ilocos	97,125	-50.6%	72,313	-5.9%
	Cagayan Valley	57,032	-26.3%	42,464	-2.7%
	Central Luzon	147,177	-59.1%	295,475	0.9%
	CALABARZON	172,319	-68.0%	267,052	7.1%
	Bicol	62,824	-52.1%	45,157	11.3%
	West Visayas	121,069	-57.6%	103,716	-6.1%
	Central Visayas	63,801	-60.8%	136,331	-10.4%
	East Visayas	67,808	-58.5%	38,264	15.7%
	Z. Peninsula	57,663	-62.8%	37,822	-14.1%
	North Mindanao	90,373	-60.1%	77,954	0.6%
	Davao	69,143	-47.4%	45,220	-18.9%
	SOCCSKSARG EN	94,375	-47.6%	56,255	3.5%
	NCR (Capital)	127,366	-65.8%	285,073	-9.2%
	CAR	25,478	-48.1%	46,475	-8.8%
	ARMM	28,959	-56.4%	3,070	19.7%
	CARAGA	28,854	-51.1%	14,763	-13.5%
MIMAROPA	29,276	-51.7%	28,646	-5.6%	

Figures 3 depicts the decline in insurance claim by disease. Acute gastroenteritis, asthma, chronic pulmonary disease, and pneumonia suffered a 60-70% decline. While the decline for chronic kidney disease, cancer and stroke were at a lower range of 20-30%. Insurance claims for dengue fever declined during the pandemic, but this reflects the cyclical cases of dengue fever in the country. The Department of Health declared dengue outbreak in 2019, with significantly lower cases reported in 2020 (Department of Health, 2019). **Figure 4** depicts the monthly claim for selected common procedures. Cataract extraction suffered a sharp decline by almost 70% during the pandemic. The lowest level occurred in April 2020

followed by a steady recovery in the second and third quarters of 2020. Other procedures such as chemotherapy, vaginal delivery, and cesarean section recorded a relatively lower decline. **Table 4** shows the number of claims and the corresponding change. **Appendix D** show the average monthly claims by disease (not adjusted for seasonality).

Figure 3. Total medical claims, by disease (seasonally adjusted), in thousands

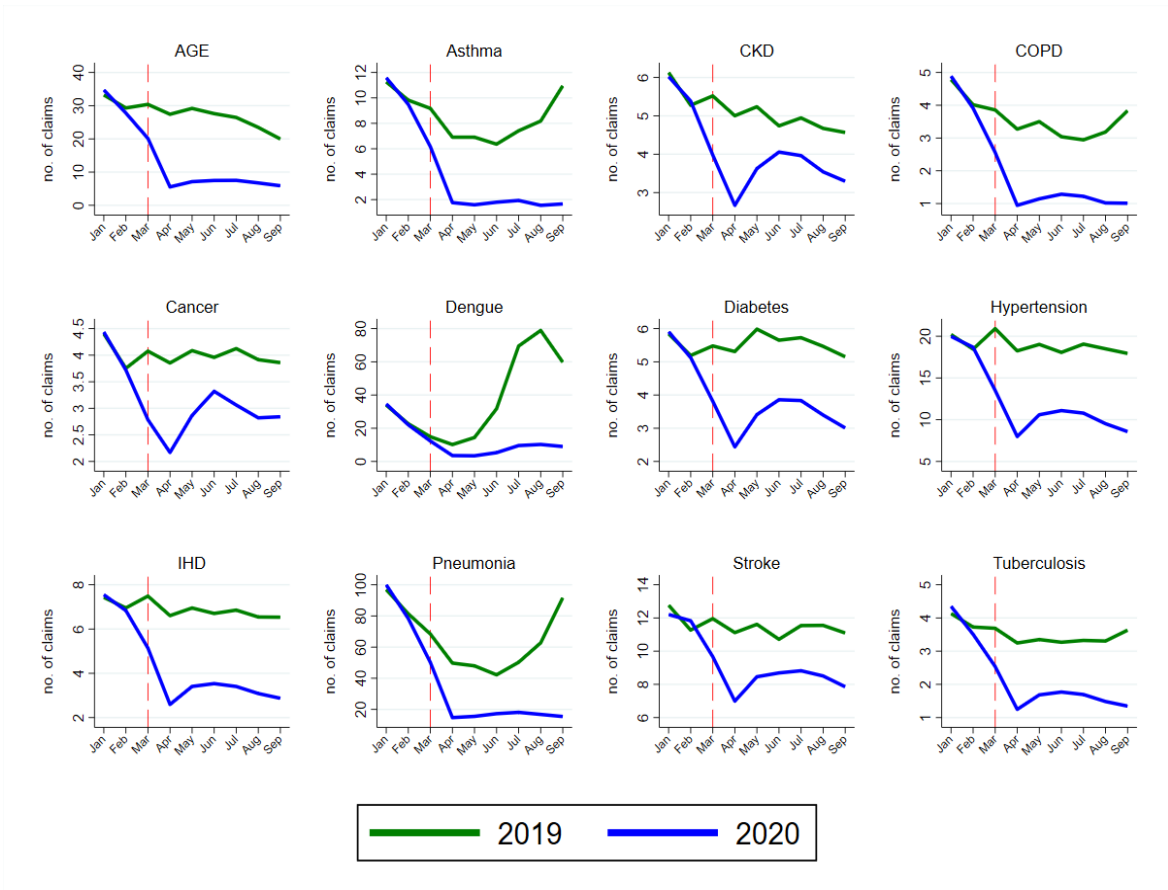


Figure 4. Total medical claims, by procedure (seasonally adjusted), in thousands

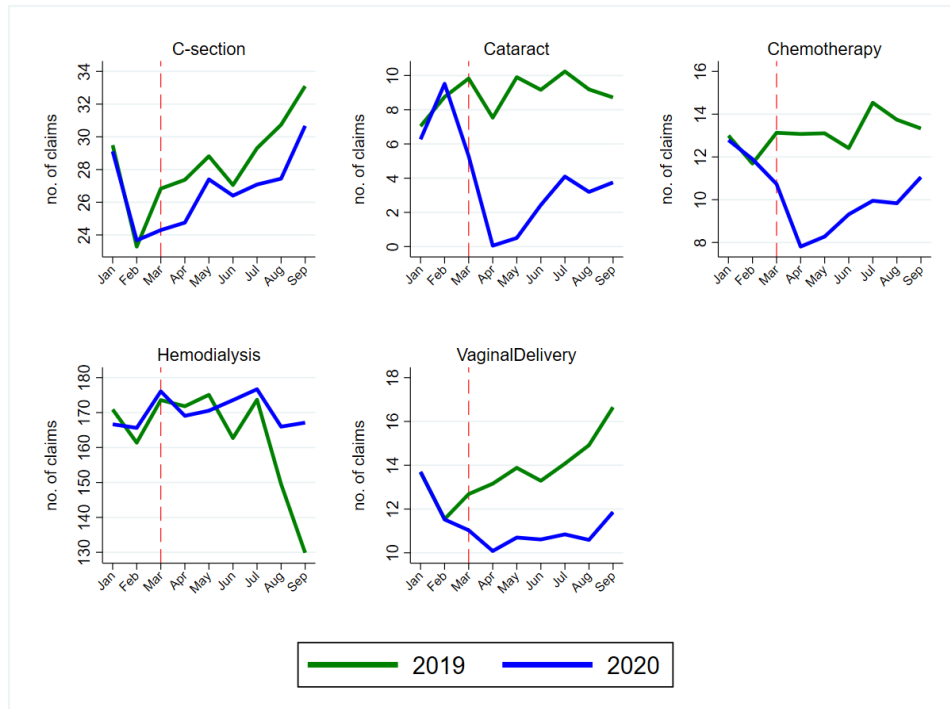


Table 4. Total medical and procedure claims, by disease

	No. of claims at baseline (March to September 2019)	Change (%)
AGE	184,514	-68%
Asthma	55,910	-71%
C-section	203,219	-7%
CKD	34,689	-27%
COPD	23,633	-61%
Cancer	27,873	-29%
Cataract	64,579	-71%
Chemotherapy	93,333	-28%
Dengue	279,350	-71%
Diabetes	38,771	-39%
Hypertension	131,728	-46%
Hemodialysis	1,136,268	6%
IHD	47,685	-50%
Pneumonia	413,067	-63%
Stroke	79,603	-26%
Tuberculosis	23,819	-51%
Vaginal Delivery	98,651	-23%

Table 5 shows the broad-based decline in medical claims, with level 3 hospitals having the largest decline. When it comes to procedure claims, the decline varies by hospital ownership and level. For example, the decline in claims for cesarean section and vaginal delivery in level 3 hospitals was compensated by an increase in insurance claims from level 2 hospitals with larger increases in private hospitals. We observed a similar trend for chemotherapy. The decline in claims for level 3 hospitals was compensated by an increase in claims for level 2 hospitals with larger increases in private hospitals. In contrast, claims for cataract extraction declined in all levels of public and private hospitals, but we observed an increasing trend in claims for both public and private hospitals in the second and third quarters of 2020.

Table 5. Change in total claims, by hospital level and disease

	Private			Public		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
AGE	-62%	-74%	-81%	-63%	-70%	-79%
Asthma	-69%	-74%	-84%	-66%	-71%	-78%
C-section	38%	3%	-22%	2%	-27%	-37%
CKD	3%	-21%	-40%	-21%	-34%	-39%
COPD	-57%	-64%	-74%	-54%	-69%	-71%
Cancer	9%	-11%	-37%	-12%	-27%	-44%
Cataract	-59%	-62%	-78%	-85%	-78%	-87%
Chemotherapy	9%	-6%	-26%	-50%	4%	-43%
Dengue	-58%	-70%	-74%	-74%	-75%	-84%
Diabetes	-24%	-39%	-58%	-35%	-48%	-60%
Hypertension	-33%	-50%	-65%	-42%	-53%	-59%
Hemodialysis	5%	5%	12%	17%	16%	-5%
IHD	-34%	-48%	-60%	-49%	-53%	-64%
Pneumonia	-61%	-62%	-67%	-66%	-67%	-59%
Stroke	3%	-15%	-30%	-7%	-38%	-53%
Tuberculosis	-50%	-55%	-59%	-46%	-53%	-55%
Vaginal Delivery	6%	-9%	-22%	-10%	-25%	-54%

4. Discussion

Insurance claims precipitously declined at least from March to September 2020 as the country struggled to contain the spread of COVID-19. This decline is a deviation from the year-on-year growth of PhilHealth claims. Based on a separate analysis of PhilHealth’s annual reports, insurance claims have increased annually by 12.5% in the last 10 years (2009-2019), which could be attributed to health financing reforms in recent years to expand health insurance coverage and benefit. About 85% of the country are PhilHealth members, and about 70% of the population rely on PhilHealth to finance their health expenses (Philippine Health Insurance Corporation, 2020; Philippine Statistical Authority, 2017). The decline therefore reflects the magnitude of impact of the pandemic on access to inpatient healthcare services.

Various reasons could explain the large decline in insurance claims during the pandemic. First, patients might have avoided going to hospitals because of the fear of getting infected. In a survey conducted in September 2020, around 85% of the population are afraid of catching COVID-19 (Social Weather Station, 2021). Second, mobility restrictions could have hindered patients to seek hospital care. The government has imposed wide-scale lockdowns and strict border control to slow the spread of COVID-19. The public transportation system was shut down particularly in mega-cities including Metro Manila from March to June 2020. Based on mobility data, foot traffic in public transportation never reached the pre-pandemic level in 2020 (Hale, et al., 2021). Third, the rapid decline in income could have reduced demand for healthcare (Yang, Prescott, & Bae, 2001; Baltagi, Lagravinese, Mascone, & Tosetti, 2016). The country's economy declined by almost 10% in 2020 and unemployment rates hit 17% and 10% in April and July 2020, respectively which significantly reduced the purchasing power of Filipino households (Philippine Statistical Authority, 2021). While PhilHealth is mandated to provide financial protection to all Filipinos, out-of-pocket spending remains an important source of financing in the country. The support value of PhilHealth, that is, the percentage covered by PhilHealth of the total cost incurred during a hospital stay, has hovered between 50% and 60% despite efforts to reduce private out-of-pocket spending and increase public spending (Obermann, Jowett, & Kwon, 2018). Fourth, reports suggest that some hospitals have temporarily reduced or shut down less essential hospital operations and services to re-allocate their resources for COVID-19 patients. The government directed public and private hospitals to allocate a minimum of 30% and 20% of their total beds to COVID-19 patients.

Assuming insurance claims accurately reflect the needs for healthcare services, the decline suggests a looming public health crisis. Infectious diseases such as acute gastroenteritis and pneumonia will have long-term consequences in children. The high incidence of untreated infection and record-high food insecurity will exacerbate chronic malnutrition in the country. Gastroenteritis and pneumonia mostly afflict children (Department of Health, 2020). About 30% of under-5 children are considered stunted (UNDP and UNICEF, 2020; Food and Nutrition Research Institute, 2020). The decline in claims for non-communicable diseases (NCDs) particularly respiratory-related diseases such as COPD and asthma have implications on disease prognosis and quality of life of patients suffering from chronic conditions. NCDs are the leading causes of disease burden in the country (Institute for Health Metrics and Evaluation, 2021). Perhaps the only consolation is the relatively lower decline in claims for life-threatening health conditions such as cancer, chronic kidney disease, and stroke.

We have noticed broad-based decline in medical claims, but changes in procedure were remarkably heterogeneous. The decline in elective surgeries (e.g., cataract surgeries) across all levels reflects the health system's effort to reduce less urgent care during the pandemic. The decline in claims for cesarean section and vaginal deliveries in end-referral hospitals (level 3) and the increase in claims for lower-level hospitals signal efforts to improve efficiency. Many level 3 hospitals in the country were considered as COVID-19 referral hospitals.

Our studies have several limitations. First, insurance claims are not necessarily reflective of the actual need for healthcare. While it is true, the decline in the number of claims for life threatening diseases even in public hospitals strengthened our argument that the pandemic

negatively impacted both essential and non-essential services. Second, changes in health-seeking behavior were not captured in the study. The shift from hospital-centric care to primary care and the adoption of other modalities such as telemedicine were excluded in our analysis.

Our results provide evidence about the broad health impact of the pandemic on non-COVID-19 patients. Some medical conditions, included in our analysis such as cancer, CKD, and stroke require effective hospitalization to improve prognosis. Hence, fewer hospitalizations for these diseases or conditions could lead to harm. Governments and health systems must find innovative solutions on how patients with conditions requiring hospitalization can access it during the pandemic.

Bibliography

- Baltagi, D., Lagravinese, R., Mascone, F., & Tosetti, E. (2016). Health Care Expenditure and Income: A Global Perspective. *Health Economics*, 26(7). doi: <https://doi.org/10.1002/hec.3424>
- Department of Health. (2019). *Dengue Surveillance Update*. Manila: Department of Health. Retrieved from <https://doh.gov.ph/sites/default/files/statistics/2019%20Dengue%20Monthly%20Report%20No.%208.pdf>
- Department of Health. (2020). *Field Health Service Information System 2019*. Manila: Department of Health. Retrieved from https://doh.gov.ph/sites/default/files/publications/FHSIS_2019_AnnualReport_09_30_2020_signed.pdf
- Department of Health. (2021, April 1). *DOH website*. Retrieved from DOH COVID Tracker: <https://doh.gov.ph/covid19tracker>
- Department of Health. (2021). *Philippine Health Facility Development Plan 2022-2040*. Manila: Department of Health.
- Egger, D., Miguel, E., Warren, S., Shenoy, A., Collins, E., Karlan, D., . . . Mobarak, A. (2021). Falling living standards during the COVID-19 crisis: Quantitative evidence from nine developing countries. *Science Advances*, 7(6). doi:10.1126/sciadv.abe0997
- Hale, A., Gldsmidt, K., Patheric, P., Philip, Webster, Cameron-Blake, . . . Tatlow. (2021). A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker). *Nature Human Behavior*. doi:<https://doi.org/10.1038/s41562-021-01079-8>
- Institute for Health Metrics and Evaluation. (2021, January 10). *GBD Compare*. Retrieved from www.healthdata.org/
- Mikkelsen, L., Phillips, D., AbouZahr, C., & Setel, P. (2015). A global assessment of civil registration and vital statistics systems: monitoring data quality and progress. *Lancet*, 1395-406.
- Obermann, K., Jowett, M., & Kwon, S. (2018). The role of national health insurance for achieving UHC in the Philippines: a mixed methods analysis. *Global Health Action*, 11(1). doi: 10.1080/16549716.2018.1483638
- Philippine Health Insurance Corporation. (2020). *Stats and Charts*. Mandaluyong: Philippine Health Insurance Corporation. Retrieved March 3, 2021, from https://www.philhealth.gov.ph/about_us/statsncharts/snc2020_1stSem.pdf
- Philippine Statistical Authority. (2021, February 15). *Labor Force Survey*. Retrieved from PSA website: <https://psa.gov.ph/statistics/survey/labor-and-employment/labor-force-survey/title/Employment%20Situation%20in%20February%202021>
- Philippine Statistical Authority. (2021). *Updated 2015 and 2018 Full Year Poverty Statistics*. Manila: Philippine Statistical Authority.
- Querri, A., Okhado, A., Kawatsu, L., Remonte, M., Medina, A., & Garfin, A. (2018). The challenges of the Philippines' social health insurance programme in the era of Universal Health Coverage. *Public Health Action*, 8(4), 175-180.

- Roberton, C., Carter, E., Chou, V., Stegmuller, A., Jackson, B., & Tam, Y. (2020). *Early Estimates of the Indirect Effects of the Coronavirus Pandemic on Maternal and Child Mortality in Low and Middle Income Countries*. Rochester, NY: Social Science Research Network.
- Shapira, G., Ahmed, T., Drouard, S., Fernandez, P., Kandpal, E., Nzelu, C., & Wesseh, C. (2020, December 30). *Disruptions in Essential Health Services During the First Five Months of COVID-19: Analysis of Facility-Reported Service Volumes in Eight Sub-Saharan African Countries*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3757414
- Social Weather Station. (2021, March 1 1). Retrieved from <http://www.sws.org.ph/swsmain/generalArtclSrchPage/?page=1&srchprm=&arttyp=6&stdtrng=&endtrng=&swityp=>
- UNDP and UNICEF. (2020). *The Impact of the COVID-19 Crisis on Households in the National Capital Region in the Philippines*. Manila: UNICEF.
- Yang, B., Prescott, N., & Bae, E. (2001). The impact of economic crisis on healthcare consumption in Korea. *Health Policy and Planning*, 16(4), 372-385.

Appendix A. ICD-10 and RVS codes used

Illness	ICD Code
Acute Gastroenteritis (AGE)	A09.0, A08.0, A08.1, A08.2, A08.3, A08.4, A07.0, A07.1, A07.2, A07.3, A07.8, A05.0, A05.2, A05.3, A05.4, A05.8, A04.0, A04.1, A04.2, A04.3, A04.4, A04.5, A04.6, A04.7, A04.8, A03.0, A03.1, A03.2, A03.8, A00.0, A00.1, A00.9, A03.9, A04.9, A05.9, A07.9, A08.5, or A09.9
Asthma	J45.00, J45.10, J45.80, J45.90, or J46
Cancer	C00.0, C00.9, C01, C02.0, C02.1, C02.2, C02.3, C02.4, C02.8, C02.9, C03.0, C03.1, C03.9, C04.9, C05.0, C05.1, C05.9, C06.0, C06.1, C06.2, C06.9, C07, C08.0, C08.1, C08.9, C09.0, C09.9, C10.0, C10.3, C10.4, C10.9, C11.0, C11.1, C11.2, C11.3, C11.9, C13.1, C13.9, C14.0, C14.8, C15.0, C15.2, C15.3, C15.4, C15.5, C15.8, C15.9, C16, C16.0, C16.1, C16.2, C16.3, C16.4, C16.5, C16.6, C16.9, C17.0, C17.1, C17.2, C17.9, C18.0, C18.1, C18.2, C18.3, C18.4, C18.5, C18.6, C18.7, C18.8, C18.9, C19, C20, C21.0, C21.1, C21.8, C22.0, C22.1, C22.2, C22.3, C22.4, C22.7, C22.9, C23, C24.0, C24.1, C24.8, C24.9, C25.0, C25.1, C25.2, C25.3, C25.4, C25.7, C25.8, C25.9, C26.0, C26.1, C26.8, C26.9, C30.0, C30.1, C31.0, C31.1, C31.2, C31.3, C31.8, C31.9, C32.0, C32.1, C32.2, C32.3, C32.9, C33, C34.0, C34.1, C34.2, C34.3, C34.8, C34.9, C37, C38.0, C38.1, C38.3, C38.4, C38.8, C39.0, C39.8, C39.9, C40.0, C40.1, C40.2, C40.3, C40.9, C41.0, C41.1, C41.2, C41.3, C41.4, C41.8, C41.9, C45.0, C45.1, C45.9, C46.9, C47.0, C47.2, C47.3, C47.4, C47.5, C47.6, C47.9, C48.0, C48.1, C48.2, C49.0, C49.1, C49.2, C49.3, C49.4, C49.5, C49.6, C49.8, C49.9, C50.0, C50.1, C50.2, C50.3, C50.4, C50.6, C50.8, C50.9, C51.0, C51.1, C51.2, C51.9, C52, C53.0, C53.1, C53.8, C53.9, C54.0, C54.1, C54.2, C54.3, C54.8, C54.9, C55, C56, C57.0, C57.3, C57.4, C57.7, C57.8, C57.9, C58, C60.9, C61, C62.0, C62.1, C62.9, C63.0, C63.2, C63.7, C63.9, C64, C65, C66, C67.0, C67.1, C67.2, C67.3, C67.5, C67.6, C67.7, C67.8, C67.9, C68.0, C68.9, C69.1, C69.2, C69.3, C69.4, C69.5, C69.6, C69.9, C70.0, C70.1, C70.9, C71.0, C71.1, C71.2, C71.3, C71.4, C71.5, C71.6, C71.7, C71.8, C71.9, C72.0, C72.1, C72.2, C72.3, C72.4, C72.5, C72.8, C72.9, C73, C74.0, C74.1, C74.9, C75.0, C75.1, C75.3, C75.5, C75.9, C76.0, C76.1, C76.2, C76.3, C76.4, C76.5, C76.7, C76.8, C77.0, C77.1, C77.2, C77.3, C77.9, C78.0, C78.1, C78.2, C78.3, C78.4, C78.5, C78.6, C78.7, C78.8, C79.0, C79.1, C79.3, C79.4, C79.5, C79.6, C79.7, C79.8, C80, C81.0, C81.1, C81.9, C82.0, C82.1, C82.2, C82.7, C82.9, C83.0, C83.3, C83.5, C83.7, C83.8, C83.9, C84.0, C84.1, C84.3, C84.4, C84.5, C85.0, C85.1, C85.7, C85.9, C90.0, C90.1, C90.2, C91.0, C91.1, C91.2, C91.3, C91.4, C91.5, C91.7, C91.9, C92.0, C92.1, C92.2, C92.3, C92.4, C92.5, C92.7, C92.9, C93.0, C93.1, C93.9, C94.0, C94.2, C94.4, C94.5, C95.0, C95.1, C95.2, C95.7, C95.9, C96.0, C96.1, C96.2, C96.7, or C96.9
Chronic Kidney Disease (CKD)	N19, N18.0, N18.5, N18.8, or N18.9
Chronic Obstructive Pulmonary Disease (COPD)	J44.0, J44.1, J44.8, or J44.9
Dengue	A97.0, A97.1, or A97.2
Diabetes Mellitus	E10.0, E10.1, E10.2+ N08.3*, E10.5, E10.6, E10.7, E10.8, E10.9, E11.0, E11.1, E11.2+ N08.3*, E11.5, E11.6, E11.7, E11.9, E12.0, E12.2+ N08.3*, E12.5,

E12.6, E12.8, E13.0, E13.1, E13.2+ N08.3*, E13.5, E13.6, E14.0, E14.1, E14.2+ N08.3*, E14.5, E14.6, E14.7, or E14.9

Hypertension	10.1, I10.9, I11.0, I11.9, I12.0, I12.9, I13.0, I13.1, I13.2, I13.9, I15.0, I15.1, I15.2, I15.8, or I15.9
Ischemic Heart Disease	I20.0, I20.1, I20.8, I20.9, I21.0, I21.1, I21.2, I21.3, I21.4, I21.9, I22.0, I22.1, I22.8, I22.9, I23.0, I23.1, I23.2, I23.3, I23.8, I24.0, I24.1, I24.8, I25.0, I25.1, I25.3, I25.4, I25.5, I25.6, I25.8, or I25.9
Pneumonia - Moderate Risk	J18.02, J18.12, J18.22, J15.02, J15.12, J15.22, J15.32, J15.42, J15.52, J15.62, J15.72, J12.02, J12.12, J12.22, B01.2+ J17.1*, B05.2+ J17.1*, B06.8+ J17.1*, B25.0+ J17.1*, B37.1+ J17.2*, B44.0+ J17.2*, B44.1+ J17.2*, B58.3+ J17.3*, B65.8+ J17.3*, B65.9+ J17.3*, A01.0+ J17.0*, A02.2+ J17.0*, A37.8+ J17.0*, A37.9+ J17.0*, A48.1, B77.8+ J17.3*, J12.92, J13.2, J14.2, J15.92, or J18.92
Stroke	I60.0, I60.1, I60.2, I60.3, I60.4, I60.5, I60.6, I60.7, I60.8, I60.9, I61.0, I61.1, I61.2, I61.3, I61.4, I61.5, I61.6, I61.8, I61.9, I62.0, I62.1, I62.9, I63.0, I63.1, I63.2, I63.3, I63.4, I63.5, I63.6, I63.8, I63.9, I63.9+G46.7*, or I64
Tuberculosis	A15.0, A15.1, A15.2, A15.4, A15.5, A15.6, A15.7, A15.8, A15.9, A16.0, A16.1, A16.2, A16.3, A16.4, A16.5, A16.7, A16.8, A16.9, or A15.3

Procedure	RVS Code
Chemotherapy Administration	96408, 96440, 96445, 96450, or 96542
Vaginal Delivery	59409 or 59612
Extracapsular Cataract Removal	66982, 66984, or 66987
Hemodialysis	90935
Cesarean Section	59513, 59514, or 59620

Appendix B. Average number of medical claims by hospital characteristics

	Jan-Dec 2018	Jan-Dec 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sep 2020
Hospital level											
Level 1	103.8	117.4	112.9	92.8	65.7	27.9	33.7	36.4	39.7	37.2	33.3
Level 2	164.2	184.7	191.5	153.0	103.5	43.4	54.5	60.6	63.5	59.4	52.3
Level 3	306.2	330.2	353.3	277.2	178.5	73.4	85.9	97.0	94.5	83.2	86.6
Ownership											
Public	187.3	212.9	207.3	170.6	117.8	49.2	55.5	60.3	64.4	60.1	55.8
Private	113.5	125.1	129.7	102.8	69.9	29.5	38.1	42.3	44.3	40.8	36.9
Socio-economic status of province											
1st quintile	108.3	118.0	132.5	104.0	65.9	23.2	29.8	34.1	34.5	32.0	32.5
2nd quintile	152.8	168.8	166.6	134.1	91.4	35.9	41.7	46.9	53.5	53.4	50.2
3rd quintile	158.8	183.6	166.1	135.2	101.1	47.2	57.8	62.9	63.3	53.6	44.5
4th quintile	166.5	187.7	185.4	153.5	108.7	52.8	63.4	66.1	71.3	65.0	54.7
5th quintile	159.0	184.6	171.4	144.9	103.2	51.7	61.5	65.3	67.9	65.0	56.7
Region											
Ilocos	167.3	178.6	174.1	142.5	98.2	40.8	54.9	61.3	73.5	74.1	69.7
Cagayan Valley	142.9	145.8	133.6	107.9	78.9	39.6	49.0	51.2	54.4	51.1	46.4
Central Luzon	117.5	126.4	150.6	117.4	74.5	28.9	35.7	42.4	45.8	44.5	43.0
CALABARZON	93.1	111.4	111.7	89.5	57.8	16.8	22.7	26.4	25.5	22.8	22.6
Bicol	133.0	157.7	160.7	135.9	102.0	57.1	68.0	72.4	70.6	64.0	57.0
West Visayas	212.3	262.8	219.7	185.1	144.0	61.1	81.0	90.5	87.3	68.0	49.3
Central Visayas	158.3	170.2	202.5	149.4	106.7	46.7	45.8	38.7	40.1	43.8	47.1
East Visayas	162.4	199.1	216.3	177.3	124.8	61.3	71.9	60.5	69.7	67.3	56.5
Z. Peninsula	169.8	200.5	157.6	131.6	92.5	45.2	51.5	59.5	58.1	52.0	49.7
North Mindanao	175.7	190.4	186.1	143.0	94.3	46.9	51.0	53.2	57.9	54.5	44.3
Davao	172.0	180.5	174.7	142.8	104.2	45.0	50.3	58.6	66.4	60.7	61.9
SOCCSKSARGEN	174.3	195.0	166.7	143.6	106.8	48.8	63.0	76.6	84.4	71.1	52.2
NCR (Capital)	115.3	121.3	138.3	107.4	62.8	19.3	24.7	29.8	27.6	24.7	28.0
CAR	132.4	137.8	126.3	113.0	86.1	41.1	43.0	41.9	45.4	43.1	41.0
ARMM	131.9	150.2	118.0	113.7	77.2	30.0	39.1	46.8	52.5	48.9	40.0
CARAGA	173.6	203.6	249.6	192.5	134.5	61.6	76.5	76.2	74.8	72.4	53.6
MIMAROPA	126.7	145.1	136.5	114.7	79.1	39.1	40.8	50.1	65.0	70.2	68.0

Appendix C. Average number of procedural claims by hospital characteristics

	Jan-Dec 2018	Jan-Dec 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sep 2020
Hospital level											
Level 1	42.0	46.6	51.1	48.3	50.4	50.6	53.2	54.3	57.0	56.0	58.8
Level 2	251.1	276.4	343.1	338.0	352.3	336.7	346.7	356.2	365.4	345.7	355.0
Level 3	640.2	655.0	743.2	715.7	711.1	615.1	618.7	627.7	638.6	597.2	618.9
Ownership											
Public	122.1	134.3	147.6	138.3	136.5	116.9	119.9	125.0	131.1	122.0	130.3
Private	169.2	179.6	216.5	212.6	220.8	211.3	216.9	220.4	225.1	215.0	220.3
Socio-economic status of province											
1st quintile	199.0	207.2	242.3	239.9	243.5	221.8	224.8	229.9	235.8	223.1	233.8
2nd quintile	155.4	169.5	197.2	185.2	190.6	178.4	181.1	184.0	188.4	184.8	191.3
3rd quintile	119.6	139.2	171.5	165.0	170.0	164.5	176.1	181.3	188.4	173.9	177.7
4th quintile	107.4	110.7	128.6	124.9	132.4	128.1	133.1	135.5	139.0	132.5	132.4
5th quintile	50.1	62.3	72.1	66.4	69.3	69.2	72.5	74.8	77.8	68.4	67.7
Region											
Ilocos	115.6	119.6	131.3	122.2	120.8	112.9	121.3	123.5	129.1	129.0	135.8
Cagayan Valley	77.7	88.1	95.3	88.5	92.7	90.0	93.7	101.7	110.2	99.7	117.7
Central Luzon	201.6	221.3	256.1	248.9	252.5	239.2	246.5	254.6	262.2	256.8	269.0
CALABARZON	152.1	158.0	185.9	179.8	184.0	175.4	179.1	183.4	191.2	186.5	193.7
Bicol	101.4	108.8	126.4	124.1	134.1	129.5	129.0	138.1	145.1	133.4	143.3
West Visayas	190.7	216.5	296.0	293.1	299.1	285.0	296.6	306.2	316.0	296.2	292.3
Central Visayas	256.5	293.9	347.1	329.4	341.7	320.6	324.1	322.6	320.7	317.8	320.4
East Visayas	113.3	102.7	108.2	102.0	108.4	104.5	110.8	109.1	114.4	110.4	115.8
Z. Peninsula	99.1	128.9	165.2	153.0	157.3	149.7	164.0	169.7	169.9	142.3	130.8
North Mindanao	130.9	141.9	172.2	165.1	177.0	171.5	174.5	176.3	178.9	162.3	160.4
Davao	101.3	102.9	121.4	110.9	111.8	102.4	103.2	104.5	104.7	103.2	109.9
SOCOSARGEN	98.1	107.2	118.2	112.9	118.7	118.2	130.3	132.0	135.8	131.0	127.6
NCR (Capital)	233.3	234.7	274.9	274.3	278.1	239.1	240.3	241.7	242.7	215.3	227.7
CAR	184.8	212.4	232.8	254.9	256.8	217.0	202.7	214.1	232.9	227.6	230.7
ARMM	10.6	15.2	15.2	14.0	17.0	14.9	13.1	14.0	15.3	13.0	12.9
CARAGA	68.7	84.3	97.9	93.4	95.3	91.0	98.4	99.7	103.7	96.8	91.7
MIMAROPA	109.5	126.2	156.8	147.7	152.3	147.9	154.1	156.3	160.8	158.9	170.5

Appendix D. Average claim per hospital, by disease (not adjusted for seasonality)

