

Budget Impact Analysis of the Proposed PhilHealth Case Rates for Acute Coronary Syndrome in the Philippines

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Abstract

OBJECTIVE: This study aimed to determine the budget impact of the proposed revised PhilHealth case rate packages for acute coronary syndrome (ACS).

METHODS: This budget impact analysis used the static approach or cost calculator modeling method. The prevalence of hospitalization for coronary artery disease in all PhilHealth-accredited hospitals in the country in 2017 and the data from the ACS registry project of the Philippine Heart Association were used in this study. The study multiplied the present PhilHealth coverage with the number of ACS hospitalization claims to come up with the total cost of ACS hospitalization in the next three years with the assumptions that the eligible population and the ACS PhilHealth case rates will remain constant for these years. The future ACS hospitalization costs were also determined if the proposed case rates were used rather than the current PhilHealth case rates. The cost of re-admissions was considered as savings in hospitalization cost (due to prevention of admissions if the appropriate interventions were given) and were deducted from the future total cost of ACS hospitalizations.

RESULTS: The annual total ACS hospitalization cost using the current case rates was Php 1,134,683,000. Using the proposed case rates, the total hospitalization costs over five years was Php 2,653,019,000 in the first year (proposed case rates implemented to only 20% of the ACS patients) and increased to Php 8,726,364,000 by year 5 (full implementation of the proposed case rates or to 100% of ACS patients). This resulted in a lower incremental cost in the first year of implementation compared with a less gradual implementation over 3 years. The total incremental costs would amount to PHP7.6 billion for full implementation.

CONCLUSION: The study provided the budget impact of the proposed revised ACS case rates. The incremental cost is relatively huge, however the benefits of providing coverage of guideline-directed therapy including invasive strategies for ACS must be considered.

INTRODUCTION

Budget impact analysis (BIA) is an important component of a “comprehensive economic assessment of a health care intervention”. It helps decision makers assess the affordability of a new health policy as it “addresses the expected changes in the expenditure of a health care system after the adoption of a new intervention”.^{1,2} However, “a BIA cannot give a single estimate applicable to all decision makers. Instead, the purpose of a BIA is to provide a valid computing framework – a ‘model’ - that allows users to apply input values and view financial estimates pertinent to their setting”.²

The epidemiologic burden of ischemic heart disease (IHD) or coronary artery disease (CAD) which includes both acute coronary syndrome (ACS) and non-ACS in the Philippines, was reported in a recent study. In 2017, there were 1,831 CAD cases for every 100,000 medical hospitalization claims from the Philippine Health Insurance Corporation (PhilHealth)-accredited hospitals or a 1.8% prevalence rate. In terms of ACS, there were 1,524 admissions for ACS for every 100,000 PhilHealth claims for a medical condition or 1.5% prevalence rate.³ The Department of Health, on the other hand, reported that IHD was the leading cause of mortality accounting for 97,945 deaths (15.75%) in the country for the year 2019.⁴

In terms of economic considerations, a local study which estimated the cost of hospitalization for ACS in 2019 using the healthcare perspective showed the huge disparity between the present PhilHealth case rates for ACS both for medical therapy alone and for invasive interventions and the actual ACS hospitalization costs.⁵

In view of the above findings and the impact of ACS among Filipino patients, a study proposing to revise the existing case rates for ACS was undertaken. However, it is imperative that the budget impact of these proposed revised case rates be analyzed.

The general objective of the study, therefore was to determine the budget impact of the proposed revised PhilHealth case rate packages for acute coronary syndrome. The specific objective was to determine the budget impact of the proposed revised PhilHealth case rate packages (either involving medical treatment alone or that for medical treatment plus invasive interventions for the following components of ACS: a) low and high risk Unstable angina (UA), b) Non-ST elevation myocardial infarction (NSTEMI), and c) ST elevation myocardial infarction (STEMI).

METHODS

Budget impact analysis can be performed either through a static or dynamic approach.⁶ In this study, the static approach or cost calculator modeling method (the simplest of the two approaches) was utilized. Its use, whenever possible, is recommended by the 2012 task force on BIA of the

International Society on Pharmacoeconomics and Outcomes Research (ISPOR) due to its “ease of use”.¹

The first of the major elements of a BIA is the determination or estimation of the size of the eligible population where the intervention would be applied. Two important local studies provided important details regarding the number of hospitalization for ACS in the country. One refers to the study on the prevalence of hospitalization for CAD in all PhilHealth-accredited hospitals in the country in 2017 and the other one is a study which reported the data from the ACS registry project of the Philippine Heart Association.^{3,7}

In terms of the number of hospitalizations for the ACS conditions in 2017, the nationwide prevalence study reported the following hospitalization claims from PhilHealth: 1) UA = 13,621, 2) NSTEMI = 3,083, and 3) STEMI = 5,164. Unfortunately, there were 20,622 hospitalizations with a final diagnosis of “myocardial infarction, unclassified”.³ PhilHealth utilizes the International Classification of Disease version 10 (ICD 10) system for encoding the final diagnosis. It should be noted, however that there is no ICD 10 code for either STEMI or NSTEMI. Therefore, if myocardial infarction (whether NSTEMI or STEMI) is written on the PhilHealth claim form without a corresponding ICD 10 code, these cases would most likely be classified under the “Myocardial Infarction, Unclassified” ICD 10 code. In view of this scenario, the proportion or percentage of NSTEMI and STEMI patients according to the PHA ACS registry data was utilized in order to delineate these “unclassified” MI patients as either STEMI or NSTEMI. Moreover, data from the PHA ACS registry provided the proportion of ACS patients who underwent invasive procedures - coronary angiography alone or with concomitant coronary angioplasty and those who underwent coronary artery bypass graft (CABG). In instances where data was lacking, experts’ opinions were sought for validation of the assumptions used in the BIA. These experts refer to the same panel of experts who were included in the study on the proposal for the revised ACS case rates. This panel of experts was convened in the formulation of the proposed ACS case rates (the criteria and composition of this panel was reported in the methodology of the said study).

The following are the current PhilHealth coverage for the following ACS conditions and essential procedures related to ACS diagnostic and therapeutic interventions: 1) Unstable Angina = PHP12,000, 2) Myocardial Infarction, (either NSTEMI or STEMI) = PHP18,900, 3) Coronary Angiography = PHP9,700, and 4) Coronary Angioplasty (immaterial of number of stents used = PHP30,300.⁸⁻¹⁰ These present PhilHealth coverage were multiplied with the number of ACS hospitalization claims to come up with the total cost of ACS hospitalization in the next three years with the assumptions that the eligible population and the ACS PhilHealth case rates will remain constant for these years. The future ACS hospitalization costs were also determined if the proposed case rates (results

given in the other study) were used rather than the current PhilHealth case rates.

The prevalence study reported that only a small percentage of the patients who had ACS underwent invasive procedures despite it being a Class I recommendation by several guidelines, particularly for STEMI.¹¹⁻¹³ Moreover, several re-admissions were noted among ACS patients. These re-admissions are important considerations in the BIA, with the assumption that they would have been prevented if the recommended procedures were undertaken. In this context, the cost of re-admissions (unit cost multiplied by the number of re-admissions) was considered as savings in hospitalization cost, hence they had to be deducted from the future total cost of ACS hospitalizations. The unit cost used for the re-admission is the PhilHealth case rate for ischemic heart disease without myocardial infarction which is PHP12,000.⁸

RESULTS

The ACS population was distributed into treatment modalities consisting of medical intervention alone (with or without thrombolysis) or a combination of medical and invasive interventions (coronary angiography or coronary angioplasty). This can be seen in Table 1 with the number of hospitalization claims together with the assumptions and sources of the data. As earlier mentioned, experts' opinions were sought for instances whereby no local data was available. In terms of the possible number of stents that could be used for PCI, it was decided by the same panel of experts the ACS PCI scenarios of having one or maximum of three stent/s. Though these would not have included all the possible variations in the number of stents used, it was agreed upon that these most probably represented majority of the ACS PCI scenarios in the country.

With the number of eligible population identified (Table 1), they were multiplied with the present PhilHealth case rates to come up with the total hospitalization costs for UA, NSTEMI, and STEMI for the subsequent years (number of eligible population

and PhilHealth case rates for ACS and PCI held constant). These costs are summarized in Table 2.

On the other hand, Table 3 shows the total future and incremental ACS hospitalization costs for the next three years if the proposed ACS case rates were used instead of the current ones and three years was chosen as the period of implementation of the new case rates. In this set-up, the total costs for the first and second years represent a combination of usage of the proposed and existing ACS PhilHealth case rates. For example, for the first year, if the proposed case rates will be implemented to only 30% of the ACS patients, the old ACS case rate is applied to the remaining 70%. The proposed case rates will be applied to 100% of the patients in the third year of implementation. Consequently, 100% of the savings in the hospitalization cost brought about by prevention of re-admissions (if invasive interventions – PCI, were done aside from medical therapy) will also be realized on the third year of implementation.

Table 4 is similar to Table 3, however, the future cost and incremental costs were spread over the next five years instead of three years. With the assumption that the PhilHealth case rates will remain constant, the hospitalization costs seen in Table 2 would be the same even for the next five years. A relatively gradual implementation, i.e., five years instead of three years resulted to an incremental cost of almost PHP1.5 billion as compared to PHP2.3 billion for the first year of implementation.

DISCUSSION

Guideline-directed interventions in ACS, both medical and invasive, have been proven to be beneficial in reducing morbidity and mortality. A conservative estimate of ACS hospitalization cost by Mendoza et al reported a range of PHP65,000 to 90,000 for medical intervention alone and PHP265,000 – 425,500 for ACS with PCI.⁵ However, this

Table 1. Number of Hospitalization Claims for ACS

| Type of ACS | Intervention | No. of Hospitalization Claims | Assumptions | Source |
|------------------------|-------------------------------------|-------------------------------|-----------------|----------------------|
| Unstable Angina | | 13,621 | | |
| Low risk | Medical | 10,965 | 80.5% of 13,621 | Reference #s 3 and 6 |
| High risk | Medical plus invasive | 2656 | 19.5% of 13,621 | Reference #s 3 and 6 |
| | plus coronary angiography (CA) only | 1328 | 50% of 2656 | Reference #s 3 and 6 |
| | plus CA and PCI—1 stent | 332 | 25% of 1328 | Experts' opinion |
| | plus CA and PCI—2 stents | 664 | 50% of 1328 | Experts' opinion |
| | plus CA and PCI—3 stents | 332 | 25% of 1328 | Experts' opinion |

(continuation of Table 1)

| | | | | |
|----------------------|--|---------------|-------------------------------------|----------------------|
| NSTEMI | | 14,724 | 3083 plus 56.45% of 20,622 = 14,724 | Reference #s 3 and 6 |
| | Medical | 10,160 | 69% of 14,724 | Reference #s 3 and 6 |
| | Medical plus invasive | 4564 | 31% of 14,724 | Reference #s 3 and 6 |
| | plus coronary angiography (CA) only | 1141 | 25% of 4564 | Reference #s 3 and 6 |
| | plus CA and PCI—1 stent | 856 | 25% of 3423 (4564 – 1141 = 3423) | Experts' opinion |
| | plus CA and PCI—2 stents | 1712 | 50% of 3423 | Experts' opinion |
| | plus CA and PCI—3 stents | 856 | 25% of 3423 | Experts' opinion |
| STEMI | | 14,145 | 5164 plus 43.55% of 20,622 = 14,145 | Reference #s 3 and 6 |
| | Medical | 4951 | 35% of 14,145 | Reference #s 3 and 6 |
| | With thrombolysis | 2475 | 50% of 4951 | Reference #s 3 and 6 |
| | Without thrombolysis | 2475 | 50% of 4951 | Reference #s 3 and 6 |
| | Medical (without thrombolysis) plus Invasive | 3678 | 40% of 9194 (65% of 14,145 = 9194) | Reference #s 3 and 6 |
| Without thrombolysis | plus coronary angiography (CA) only | 405 | 11% of 3678 | Reference #s 3 and 6 |
| | Plus CA and PCI—1 stent | 818 | 25% of 3273 (3678 – 405 = 3273) | Experts' opinion |
| | Plus CA and PCI—2 stents | 1637 | 50% of 3273 | Experts' opinion |
| | Plus CA and PCI—3 stents | 818 | 25% of 3273 | Experts' opinion |
| | Medical (with thrombolysis) plus Invasive | 5516 | 60% of 9194 | |
| With thrombolysis | plus coronary angiography (CA) only | 607 | 11% of 5516 | |
| | Plus CA and PCI—1 stent | 1227 | 25% of 4909 (5516 – 607 = 4909) | Experts' opinion |
| | Plus CA and PCI—2 stents | 2455 | 50% of 4909 | Experts' opinion |
| | Plus CA and PCI—3 stents | 1227 | 25% of 4909 | Experts' opinion |

NSTEMI=non-ST-elevation myocardial infarction; STEMI=ST-elevation myocardial infarction; NSTEMI-ACS=non-ST elevation acute coronary syndrome; UA HR=unstable angina high risk; CA=coronary angiogram; PCI=percutaneous coronary intervention

Table 2. ACS Hospitalization Costs Using Current PhilHealth Case Rates

| Type of ACS | Annual Cost in Philippine Pesos |
|-----------------|---------------------------------|
| Unstable Angina | 216,573,000 |
| NSTEMI | 393,063,000 |
| STEMI | 525,047,000 |
| Total | 1,134,683,000 |

ACS=acute coronary syndrome; NSTEMI=non-ST-elevation myocardial infarction; STEMI=ST-elevation myocardial infarction.

Table 3. Future and Incremental ACS Hospitalization Costs for the Next 3 Years

| | 1st Year—30% New (70% Old)* | 2nd Year—70% New (30% Old)* | 3rd Year - 100%* |
|---|--------------------------------|--------------------------------|----------------------|
| UNSTABLE ANGINA | 484,272,000 | 1,129,968,000 | 1,614,240,000 |
| NSTEMI | 758,463,000 | 1,769,747,000 | 2,528,210,000 |
| STEMI | 1,379,163,000 | 3,218,047,000 | 4,597,210,000 |
| SUB-TOTAL | 2,621,898,000 | 6,117,762,000 | 8,739,660,000 |
| Less savings [prevention of readmissions: prevalence × case rate; 1108 in 2017; case rate = PHP 12,000] | 30% of 13,296,000 | 70% of 13,296,000 | 13,296,000 |
| Total future costs* | 3,412,187,000 | 6,448,860,000 | 8,726,364,000 |
| Incremental costs (future cost less present cost, ie, using PhilHealth case rates) | 2,277,504,000 | 5,314,177,000 | 7,591,681,000 |

NSTEMI=non-ST-elevation myocardial infarction; PHP=Philippine pesos; STEMI=ST-elevation myocardial infarction.

*represents use of new case rates for 30% or 70%, while the old case rate is applied to the rest of the population; the corresponding savings is applied accordingly e.g., 30% of savings if the new case rate is applied to 30% of the population (100% savings is applied in the 3rd year once implementation is 100%).

Table 4. Future and Incremental ACS Hospitalization Costs for the Next 5 Years

| | 1 st Year 20% New (80% Old)* | 2 nd Year 40% New (60% Old)* | 3 rd Year 60% New (40% Old)* | 4 th Year 80% New (20% Old)* | 5 th Year 100% |
|--|---|---|---|---|------------------------------|
| UNSTABLE ANGINA | 322,848,000 | 645,696,000 | 968,544,000 | 1,291,392,000 | 1,614,240,000 |
| NSTEMI | 505,642,000 | 1,011,284,000 | 1,516,926,000 | 2,022,568,000 | 2,528,210,000 |
| STEMI | 919,442,000 | 1,838,884,000 | 2,758,326,000 | 3,677,768,000 | 4,597,210,000 |
| SUBTOTAL | 1,747,932,000 | 3,495,864,000 | 5,243,796,000 | 6,991,728,000 | 8,739,660,000 |
| Less savings: cost of readmissions | 20% of 13,296,000 | 40% of 13,296,000 | 60% of 13,296,000 | 80% of 13,296,000 | 13,296,000 |
| Total future costs* | 2,653,019,000 | 4,171,355,000 | 5,689,692,000 | 7,208,028,000 | 8,726,364,000 |
| Incremental costs (future cost less present cost) | 1,518,336,000 | 3,036,672,000 | 4,555,009,000 | 6,073,345,000 | 7,591,681,000 |

NSTEMI=non-ST-elevation myocardial infarction; STEMI,=ST-elevation myocardial infarction.

*Represents use of new case rates for 20% or 40% or 60% or 80%, while the old case rate is applied to the rest of the population; the corresponding savings is applied accordingly e.g., 20% of savings if the new case rate is applied to 20% of the population (100% savings is applied in the 5th year once implementation is 100%).

study was limited by its data source since costing was based only on few hospitals (located in the National Capital Region and a suburban area south of Manila). In addition, the cost for PCI was based on the use of a single stent only. Thus, the proposed revised rates were based on a later study which involved cardiologists from the northern to the southern parts of the country aside from the National Capital Region and computed PCI cost using a maximum of three stents. Given the highest possible PhilHealth coverage of PHP39,750 (total

coverage for PCI and ACS), the current PhilHealth coverage for ACS hospitalizations represent a small percentage of the actual hospitalization cost.⁵ In 2018, the Filipino average annual family income and expenditure were PHP313,000 and PHP239,000, respectively, leaving only PHP79,000 as savings.¹⁴ With majority of health care delivery obtained through out-of-pocket expenses,⁵ it is understandable that a lot of patients will not be able to afford the above ACS hospitalization costs, hence the proposal for the revised ACS case rates.

On the other hand, a budget impact analysis is important whenever revisions in the existing financing of health care interventions are proposed. A BIA would enable health policy and decision makers determine the effect of implementing the revised coverage for ACS on its current and future budget. Moreover, the BIA can also help plan the period of implementation, i.e., a shorter or a more gradual implementation given the budget constraints. For example, using the existing PhilHealth case rates, the current ACS hospitalization costs a little more than PHP1.13 billion, while full implementation of the proposed rates would amount to about PHP7.6 billion. Implementing it in three or five years would mean an incremental cost of PHP600 million or PHP1.47 billion during the first year of implementation. Subsequent years would then lead to higher incremental costs in consideration of the percentage of implementation for these years. These amounts maybe huge, however, the resulting reduction in morbidity and mortality as well as possible increase in economic productivity of those patients who will be able to return to work must be considered.

Lastly, the use of the PhilHealth case rate for ischemic heart disease without myocardial infarction (PHP12,000) as the unit cost for the re-admissions could be an under-estimation. Lumping these re-admissions under the above diagnosis did away with the possibility that some re-admissions were for myocardial infarction which corresponds to higher hospitalization costs. Moreover, the number of re-admissions for the same condition or diagnosis, e.g., myocardial infarction which occur within 90 calendar days is not provided coverage by PhilHealth because of the PhilHealth single period confinement rule. Under this rule, admissions and re-admissions for the same condition or procedure within a period of 90 calendar days would correspond to only one PhilHealth case benefit. Thus, if an ACS patient gets re-admitted for the same ACS condition within 90 calendar days, the second confinement for the same diagnosis would not get the PhilHealth coverage.¹⁵

CONCLUSION

The study provided the budget impact of the proposed revised ACS case rates. The total incremental costs would amount to PHP7.6 billion for full implementation. Reduction in morbidity and mortality and a possible increase in economic productivity by enabling coverage of these guideline- directed interventions should be an important consideration in the efficient use of health care resources. Lastly, since the basis of the hospitalization claims was that for 2017, the cost would hold true if the number of ACS hospitalization claims remain constant.

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