Breast Cancer in the Philippines: A Financing Cost Assessment Study

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ABSTRACT

Objectives. The aim of the study is to estimate the cost of breast cancer diagnosis, treatment, and management in the Philippines. Specifically, it aims to identify the resource requirements and interventions related to breast cancer diagnosis, treatment, and management, measure resource volumes (number of units), learn to value resource items (unit costs), and determine the total cost of treatment per disease stage.

Methods. The study covered nine tertiary hospitals, seven of which were government hospitals and two were private hospitals, with all tertiary hospitals providing breast cancer services and accredited by Philippine Health Insurance Corporation (PHIC or PhilHealth) for the Z-Benefit Package. Interventions and services related to breast cancer included radiographic procedures, laboratory and imaging tests, chemotherapy drugs and medications, medical and surgical supplies, surgical rates (for breast surgery), accommodation, staff time and salary/professional fees, and other procedure fees. The study conducted in 2022, examined cost prices of breast cancer interventions and services from stage 1–3B.

Purposive and convenience sampling were used based on PhilHealth accreditation and willingness of hospitals to participate in the study. The study conducted a focus group discussion with oncologists, radiologists, anesthesiologists, and other health care providers to validate the clinical guideline used and to solicit inputs to the costing design, analysis framework, and tools for data collection. Data collection of financial cost information (charge price) was conducted using a set of costing matrices filled out by the various departments of the hospitals. Costs and median rates were calculated across hospitals on diagnostics and imaging tests, surgery costs of both public and private facilities, medical treatment, and radiotherapy.

Results. Breast MRI, Breast Panel, and Chest CT Scan are the top 3 most expensive diagnostic procedures ranging from PhP 8,102.00 to PhP 9,800.00 per procedure. Surgical procedures for breast cancer at private hospitals and public hospitals showed huge differences in costs. The cost of a cycle of chemotherapy ranges from PhP 596.70 to PhP 3,700.00 per session, while the cost of targeted therapy can cost up to PhP 46,394.21 per session. A year of hormone therapy ranges from PhP 3,276.00 with the use of Tamoxifen, and up to PhP

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68,284.00 with Goserelin. Aromatase inhibitors such as Anastrozole and Letrozole cost from PhP 18,000 to PhP 36,000, respectively. Multiple cycles depending on the diagnosis are prescribed per patient and used in combination with other chemotherapy medications or other therapies such as targeted therapy and hormone therapy are usually taken daily up to 5 to 10 years. Conventional radiotherapy can cost up to PhP 88,150.00 covering 28 sessions, CT simulation, and CT planning.

Conclusion. This cost study provides relevant information and better perspective on benefit development for the PHIC, policy development for Department of Health on where and how to focus their support for the patient's financial preparedness to address medical and financial catastrophes.

PhilHealth needs to guide the health care providers of their costing method and to develop their own integrated, interoperable, and comprehensive cost data library.

It recommends that the government allocate budget and cover for screening and assessment for earlier stage diagnosis of patients and lower health expenditure costs on cancer treatment.

Keywords: breast cancer, chemotherapy, mastectomy, radiation therapy, financial cost

INTRODUCTION

Cancer continues to be one of the leading causes of death in the Philippines. Over 140,000 Filipinos were diagnosed with cancer in 2018, with around 80,000 lives claimed.[1]

Breast cancer is a malignant proliferation of epithelial cells lining the ducts or lobules of the breast.[2] According to GLOBOCAN, it is the leading cause of cancer morbidity in the Philippines with 27,163 cases in 2020 and the 3rd leading cause of death due to cancer. Worldwide, incidence and mortality from breast cancer is expected to increase by 50% between 2002 and 2020. It will be greatest among developing countries with a 55% increase in incidence and 58% increase in mortality.[3] As such, there is a need to create a general cancer program or a breast cancer program especially in developing countries despite the low reported incidence of breast cancer in these areas.

In the Philippines, the incidence of breast cancer falls within the range of 31.1 to 41.0 per 100,000 women. As for mortality due to breast cancer, the Philippines falls within the range of 12.1 to 15.0 per 100,000 women. The incidence rate was observed to be increasing sharply starting at the age of 30. In 2008, the incidence/mortality ratio in the Philippines is 3:1, which is relatively lower compared to other developed countries.[4] The associated years of healthy life lost in adults amounts to more than 34,000 disability adjusted life years (DALYs) for 40 to 44 years, more than 43,000 DALYs for 45 to 49 years, more than 44,000 DALYs for 50 to 54 years, and more than 39,000 for 55 to 59 years from breast cancer.[5]

Significance of the Study

In 2019, Republic Act No. 11215, the National Integrated Cancer Control Act or NICCA, was signed into law to help address the alarming cancer cases in the country. NICCA aims to streamline a responsive, equitable, accessible, and affordable cancer care plan with government and stakeholders' support. One of the ultimate goals of NICCA is to support patients, especially the poor, by increasing investments for funding through the Cancer Assistance Fund which will complement the support of the Philippine Health Insurance (PhilHealth).[6]

Expansion of the PhilHealth's Z - benefit package for Cancer, Zero and Fixed Co-Payment Policies, and DOH's Cancer Supportive Care and Palliative Care Medicines Access Program are major components of the Philippine Cancer Control Program. Last Feb 4, 2021, during the Pharmaceutical and Healthcare Association of the Philippines (PHAP) Forum in celebration of the World Cancer Day and second anniversary of the passing of NICCA, Sec. Francisco Duque emphasized such Financial Risk Protection mechanisms.[7]

Study Rationale and Objectives

Over the last decades, there have been significant changes in cancer treatment and diagnosis leading to improved outcomes. Unfortunately, these advances led to dramatic increases in cancer care costs for patients and society.

Advancement in cancer treatment, surgery, and diagnostics procedures led to sharp rise in cancer care costs. Cost is a critical and essential aspect to address when providing cancer care.

The current PhilHealth Z-benefit package for breast cancer does not cover all stages of the disease, it has a low coverage up to only PhP 100,000.00 – an amount not sufficient to cover the expenses for patient's cancer care – and due to the lack of cost data has not been updated since 2012.

This study used a mixed-methods approach of estimating the cost of diagnosing and treating Breast Cancer (BC) in the Philippines using prices from 2021. The study utilizes a bottom-up costing approach in providing unit prices for each intervention. Purposive and convenience sampling was utilized to identify hospitals in the study.

The Philippines' universal health care law has adopted the casemix system of diagnosis related group (DRG) as a payment method of the National Health Insurance. DRG requires updated clinical data, demographic data, and resource use data as well as costing data for processing claims payment.

The general objective of the study is to estimate the cost of breast cancer diagnosis, treatment, and management in the Philippines. Specifically, it aims to identify the resource requirements and interventions related to breast cancer

diagnosis, treatment, and management, measure resource volume (number of units), value resource items (unit cost) to serve as evidence for decision making and resource allocation, and inform PhilHealth on Z-Benefit Package development.[a]

Epidemiology

Cancer is one of the main causes of mortality worldwide. In 2008, 8 million deaths were recorded because of malignant diseases, and this figure is estimated to reach 11 million by 2030.[8] Breast cancer is the most common cancer among women and one of the most important causes of death among them. Although the prevalence of breast cancer is higher in developed countries, higher mortality rates are observed in less developed regions.[8]

In the GLOBOCAN 2020 report, breast cancer in the Philippines is the most common cancer accounting for 17.7% of all new cases (both sexes, all ages, population base = 109, 581, 085), and ranks third in cancer mortality with 10.7% (next to lung and liver cancers).[9] Compare these figures with those in the "2015 Philippine Cancer Facts and Estimates", published by the Philippine Cancer Society– where "incidence and mortality estimates were calculated using GLOBOCAN 2012 version" – showing the estimated new cases for breast cancer was ranked first, and third for estimated number of deaths.[10]

Breast cancer accounts for 17% of all cancer cases in the country for both sexes and 10.7% of all breast cancer deaths.[9] Public awareness on cancer prevention is low. Most Filipinos consult doctors only when their cancer is already in the advanced stages. Thus, survival rates are low.[11]

Cost of Breast Cancer Care

Most published studies on the cost of breast cancer by stage are limited and primarily conducted in high income countries.[12] According to Sun et al., one of the main reasons why there is limited data on the cost per staging is the lack of standardized code for breast cancer stages, as the WHO International Classification of Diseases (ICD) does not include codes for the stage of cancer diseases. A systematic review of breast cancer costs shows that stage II-IV were 32%, 95% and 109% higher than the cost of treating stage I since patients with advanced stage receive more treatment than early-stage patients.[12] Among the studies included in the systematic review, costs have varied in-between countries probably due to the difference in survival rates ranging from 80% in North America, 60% in middle income countries and below 40% in low-income countries which reflects the varying treatments that are accessible and available to patients.[12] Advancement in medical technology have led to changes in therapy for breast cancer treatment wherein breast conserving surgery is the intended surgical approach for early-stage breast cancer, and endocrine and targeted therapy have become more available. Although there has been limited available data, the review concludes that the results are still consistent with associating earlier detection of breast cancer and lower treatment costs.[12]

Social Health Insurance Coverage

In 2012, PhilHealth introduced the Z Benefit Package for breast cancer which covers PhP 100,000.00 for Stage 0 to IIIA.[13]

Apart from the Z Benefits for breast cancers, PhilHealth covers mastectomy and breast reconstruction surgery among other surgical procedures. Their description and rates are summarized in Appendix Tables 1 and 2 while Appendix Table 3 summarizes the radiation oncology rates.

METHODS

This study used a mixed-method approach in estimating the cost of diagnosing and treating Breast Cancer (BC) in the Philippines using prices from 2021. The study utilizes a bottom-up costing approach in providing unit prices for each intervention. The study used actual prices from hospital to get the financial cost while using the clinical protocol and guidelines to estimate the resources used and interventions needed to provide care. The study used the purchaser perspective which aims to estimate the cost of covering a service for beneficiaries. Hence, for the sampling of facilities, purposive and convenience sampling was utilized to identify hospitals in the study. The research protocol has also undergone the San Juan De Dios Hospital Ethics Review Board and a one-year expedited approval on December 22, 2021 (IRB Reference No. SJIRB-2021-0044/E-OTR).

The sample for this study is composed of 19 Accredited Z-Benefit for Breast Cancer. Three private and 16 government hospitals were qualified and invited to participate in the study. Letters addressed to the Medical Directors were issued to inform them of the research and request for cost data. Online orientations were held with hospitals interested to participate in the study. Cost items to be gathered and data gathering strategies were outlined with key staff. Thereafter, copies of cost matrices were emailed for further details on cost prices needed. However, only two private hospitals, and seven government hospitals agreed to participate and shared actual cost information. Costing matrices used in the study to gather costing data were validated through a focus group discussion with oncologists, anesthesiologists, radiologists, and other relevant health providers involved in cancer care.

Financial cost was collected using the following information shown in Table 1. Financial cost refers to "the actual expenditure paid on the inputs for producing the services reflecting how much money has been spent."[14] Cost information was mostly collected as charge prices as these are the only readily available data that the facilities were willing to share to the study group.

[a] *PhilHealth recently updated their Z-Benefit Package for Breast Cancer using inputs from this study.)*

A data collection tool was developed using MS Excel. The data collection tool was given to the hospital administration staff to input and encode price information. Actual data collection took some time to complete in view of the many hospital departments involved as cost centers in providing breast cancer services. These included administrative and finance units, accounting offices, supply, surgery, imaging units, pharmacy, and radiology. Costing matrices were disseminated to these units to determine prices for each breast cancer procedure. In addition, hospitals followed specific internal protocols and had varying requirements to authorize data collection from within the hospital. Data gathering was approved by the Medical Director, passed through a research or ethics committee, or assign a specific unit or staff to coordinate data collection from the different units. Formal letters and forms were often required to extract data from hospital operations. Information was sometimes not readily available or organized to efficiently complete the cost matrices provided.

Data analysis shows results of median prices from all the available data collected. The median prices were then used as input to provide a snapshot analysis of the cost of Stage 2B Triple Positive Breast Cancer.

Scope and Limitations

The study sites were selected purposively. There is no intention to get a representative sample for the whole country.

The study has sampled all the accredited Z-Benefit package providers. Out of the 19 hospitals providing Z-Benefit package for breast CA, only nine hospitals agreed to participate in the study, seven of which were government hospitals while two were private hospitals. Therefore, median prices might be underestimated due to the nature of subsidized government prices. At the same time, not all hospitals were able to submit complete data sets.

The costing sample only covers interventions identified for the Z-Benefit Package for Breast Cancer. Due to the lack of a National Clinical Practice Guideline at the time of inception and data collection, the study utilized interventions mentioned in the National Cancer Care Network Guidelines. The study also included a snapshot analysis of the cost of a Stage IIB Triple Positive Breast Cancer following one of the clinical pathways used by a government hospital *that* was part of the sample. Diagnostic and treatment procedures offered by each hospital for breast cancer were outlined and costing indicated. These included laboratory and diagnostic imaging, medications, medical supplies, radiation therapy, medical staff or professional fees, the Z package benefits and other fees such as room rates, laboratory, Post Anesthesia Care Unit (PACU), and internship. In the meantime, only two out of the nineteen hospitals submitted surgery cost data.

RESULTS

Screening and Diagnosis

Table 2 summarizes the median cost of imaging and laboratory tests used to diagnose breast cancer. Breast MRI, Breast Panel, and Chest CT Scan are the Top 3 most expensive diagnostic procedures ranging from PhP 8,102.00 to PhP 9,800.00 per procedure.

Treatment and Management

Surgery and Other Procedures

Table 3 and Table 4 show the rates of surgical procedures to diagnose and treat breast cancer. Professional fees, medical supplies, and other fees such as OR fees are the main cost drivers of the procedures.

Medical Treatment and Management

The cost per cycle of medical treatment and management of Breast CA is summarized in Table 5. The cost of a cycle of chemotherapy ranges from PhP 596.70 to PhP 3,700.00. Meanwhile, the cost of targeted therapy can cost up to PhP

Table 1. Cost Items and Data Source

Cost Item	Cost Information	Data Source
Drugs and Medicines	Charge Price	Price List
Diagnostics and Imaging	Charge Price	Price List
Medical Supplies and Consumables	Charge Price	Price List
Procedure Fee	Charge per procedure	Price List
Professional Fee	Charge per consultation / procedure	Price List
Accommodation	Charge per day	Price List

Table 2. Diagnostic and Imaging Tests

Diagnostic and Imaging Tests	Median	Min	Max
2D-Echocardiogram	4,004.00	3,300.00	5,040.00
Breast MRI	9,800.00	9,200.00	11,683.11
Breast Panel (Hormone + IHC)	8,675.50	8,000.00	9,351.00
ER/PR Hormone Test	4,085.00	4,085.00	4,085.00
HER2 Neu immunohistochemistry testing	2,495.00	1,400.00	3,805.00
Breast Ultrasound	950.00	450.00	2,553.00
Chest diagnostic CT with contrast	8,102.00	3,000.00	14,052.00
Chest Radiography	370.00	150.00	1,277.00
Core-needle biopsy	2,600.00	700.00	15,200.00
Mammography	2,337.50	1,800.00	6,250.00
Metabolic panel with liver function tests and alkaline phosphatase	6,920.00	3,410.00	6,950.00

46,394.21 per cycle. Furthermore, a year of hormone therapy ranges from PhP 3,276.00 with the use of Tamoxifen, and up to PhP 68,284.00 with Goserelin. Aromatase inhibitors such as Anastrozole and Letrozole cost from PhP 18,000 - PhP 36,000, respectively. Multiple cycles depending on the diagnosis are prescribed per patient and can be used in combination with other chemotherapy medications or other therapies such as targeted therapy and hormone therapy which is usually taken daily for up to 5 to 10 years.

Radiotherapy

Table 6 shows the different rates for various radiation oncology procedures. Rates for radiotherapy are shown on a daily basis, while rates for CT simulation and Treatment Planning are shown as one-time payment. The data includes rates from two government hospitals only.

Snapshot Analysis of Stage IIB Triple Positive Breast Cancer

To illustrate the cost of treatment of breast cancer, Table 7 shows the breakdown of interventions needed to treat a Breast CA Stage IIB triple positive patient. Diagnostics and imaging include such as breast ultrasound, chest radiography, mammogram, complete metabolic panel, core needle biopsy, 2D-echocardiogram, and tests such as immunohistochemistry testing for HER2 status, and genetic testing to confirm ER/PR status. The **total median cost of diagnostics is at PhP 23, 761.50**. Meanwhile, surgical procedures such as **total mastectomy can cost up to PhP 277,912.62.** This cost already includes professional fees and other preoperative laboratory tests. We have also assumed that for medical management, a patient with Stage IIB triple positive cancer will have to undergo chemotherapy, targeted therapy, and hormone therapy followed by radiotherapy. We

Table 3. Cost of Surgical Procedures in One Private Hospital

	Drugs and Medicines	Medical Supplies	Labs and Imaging	Other Fees	Professional Fee	Accommodation Fee	Total
Total Mastectomy	40,676.23	57,061.80	27,583.01	32,124.20	207,600.00	10,780.00	375,825.24
Modified Radical Mastectomy	18,743.49	31,740.61	14,967.71	27,305.80	120,375.00	9,700.00	222,832.61
Lumpectomy (Excisional Biopsy)	2,240.80	8,116.34	4,063.50	8,604.48	7,020.00		30,045.12
Lumpectomy (Wide Local Excision)	15,126.21	30,579.34	3,982.28	21,241.45	23,190.94	5,615.00	99,735.22
Sentinel Lymph Node Biopsy	25,154.71	18,148.02	11,396.21	20,763.70	76,875.80	3,075.00	155,413.44
Axillary Lymph Node Dissection	13,764.73	20,086.17	15,681.96	21,613.38	34,700.00	4,475.00	110,321.24
Reconstructive Breast Surgery	92.06	3,929.39	21,945.82	6,712.15	19,400.00	1,910.00	53,989.42

Table 4. Cost of Surgical Procedures in One Government Hospital

Surgical Procedure	Price
Consultation	850.00
FNAC Clinic Setting (Aspiration)	5,000.00
Core Needle Biopsy Clinic Setting	9,000.00
Core Needle Biopsy Clinic Setting (Bilateral)	15,000.00
CNB UTZ-Guided (with Radio)	20,000.00
CNB UTZ-Guided (without Radio)	34,000.00
Excision of Breast Mass (1 Lump) Local	30,000 to 40,000
Excision of Breast Mass (1 Lump) Sedation (with Radio)	35,000 to 50,000
Excision of Breast Mass (2 Lumps) with Anesthesiologist	40,000 to 60,000
Partial Mastectomy/Lumpectomy/ Wide Excision (GA)	120,000 to 180,000
Sentinel Lymph Node Biopsy (only) under Anesthesia	70,000 to 80,000
Simple/Total Mastectomy/Subcutaneous Mastectomy (GA)	150,000 to 180,000
Modified Radical Mastectomy (GA)/BCS + ALND/BCS + LNB Partial Mastectomy + Oncoplastic Surgery	200,000 to 250,000

Table 5. Summary of Cost Items and Price Per Cycle

Cost Items	Units	Unit Price (Median)	Price Per Cycle
Chemotherapy			
Doxorubicin, 50 mg/vial	2	604.80	1,209.60
Cyclophosphamide, 500 mg/vial	2	298.35	596.70
Docetaxel, 80 mg/vial	1	2,365.00	2,365.00
Docetaxel, 20 mg/vial	2	1,209.90	2,419.80
Paclitaxel, 100 mg/vial	1	3,700.00	3,700.00
Carboplatin, 450 mg/vial	1	2,080.00	2,080.00
Targeted Therapy			
Trastuzumab, 150 mg/vial	3	15,464.74	46,394.21
Hormone Therapy			
Anastrozole, 1 mg/tab	360	100.00	36,000.00
Letrozole, 2.5 mg/tab	360	49.88	17,956.80
Tamoxifen, 20 mg/tab	360	9.10	3,276.00
Goserelin, 10.8 mg/pre-filled syringe	4	17,071.00	68,284.00
Others			
Professional fee	1	8,000.00	8,000.00
Procedure Fee	1	2,556.50	2,556.50
Medical Supplies	1	4,600.00	4,600.00
Anti-emetic	1	135.00	135.00
GCSF	1	2,810.00	2,810.00
IV Fluids	1	130.00	130.00

Table 6. Radiation Oncology Rates

Radiation Oncology Procedures	Median Rate
Conventional Radiotherapy	2,200.00
3D Conformal Radiotherapy	3,500.00
Intensity-Modulated Radiation Therapy	6,375.00
Conventional CT Simulation	17,550.00
3D Conformal CT Simulation	22,650.00
Intensity-Modulated Radiation Therapy CT Simulation	38,150.00
Conventional Treatment Planning	9,000.00
3D Conformal Treatment Planning	12,250.00
Intensity-Modulated Radiation Therapy Planning	24,500.00

have included 4 sessions of the combination of doxorubicin, cyclophosphamide, and docetaxel **for chemotherapy which can cost up to PhP 26,364.40 for the drugs alone.** Moreover, we included 18 sessions of trastuzumab–**which is a targeted therapy for HER2+ patients–which costs PhP 835,095.96 for drug therapy alone. In combination, it costs up to PhP 1.2 million including procedure fees and professional fees which contributes to 70% to 75% of total costs.** For ER/PR positive patients, hormone therapy is given which can either be tamoxifen for premenopausal women and aromatase inhibitor such as anastrozole for post-menopausal women. On one hand, **one year of tamoxifen can cost up to PhP 32,760.00 however it is usually given for 5-10 years which can inflate the cost to up to PhP 163,500 (5 years) and PhP 327,600 (10 years).** On the other hand, **anastrozole which is given 4 times can cost up to PhP 180,000.** The addition of hormone therapy can drive the cost to up to **80% of total costs of drug therapy on the overall treatment costs.** Medical management is further followed by radiotherapy which includes **CT simulation, planning, and up to 28 daily sessions of conventional radiotherapy that can cost up to PhP 88,150.00**. **In total, treatment of Stage 2B triple positive Breast CA can cost up to PhP 1.6 million to PhP 1.8 million.**

DISCUSSION

Current coverage vs. current price

Comparing current PhilHealth coverage for Breast CA with current prices from hospitals shows a huge gap. As mentioned in the study of Apostol et al. there has been no review of all Z-benefit packages conducted since its inception in 2012 and there were no adjustments done to account for inflation. At the same time, diagnostic procedures such as biopsies are not covered by PhilHealth if done on an outpatient basis.[15] Medicines for chemotherapy, endocrine therapy, and immunotherapy are the biggest cost drivers to the treatment of cancer at almost 70% to 80%, the same estimates provided by AC Health and the same key findings mentioned in the global systematic review of Sun et al.[12,15] Case rates for conventional radiotherapy are sufficient to cover for the costs. However, the current Z-benefit package of PhP 100,000.00 can barely cover the remaining costs of surgery and chemotherapy or even targeted therapy. At the same time, outpatient therapies such as hormone therapy are also not covered currently.

Availability of Cost and Clinical Information

How PhilHealth was able to develop the present Z-benefit package is still unclear since no available documents that defined the costing process involving analysis of actual cost expenditure are made available for comparison of this costing study.

For the hospitals contacted for this study, there was no central repository of cost data even within hospitals which created a challenge in collecting information. Majority of the sample hospitals were not able to give a complete set of data, while some units in the hospital were more cooperative than the others. Central repository of clinical statistics related to cancer was also not available due to lack of a registry. Most hospitals under study kept separate data and file per cost center i.e., accounting, finance, radiology, Surgical Department, pharmacy, Nuclear Department, making data collection confusing, tedious, and at times complicated.

Standard Procedures and Interventions for Breast CA - CPG, Manual of Operations

At the beginning of the study in 2021, there were no approved Clinical Practice Guidelines (CPG) available yet. It was only at the later part of 2022 that an approved CPG was made available. Given that a CPG is now available, implementation and monitoring must be ensured by a health body, a professional or civil society or health department program to fully benefit the potential beneficiaries. Hence,

Table 7. Total Cost of Stage IIB Triple Positive Breast CA by Intervention

	Premenopausal	% of Total	Post-menopausal	% of Total
Diagnostics	23,761.50	1.4%	23,761.50	1.3%
Surgery	277,912.62	16.9%	277,912.62	15.5%
Chemotherapy +Targeted Therapy	1,222,363.36	74.3%	1,222,363.23	68.2%
Hormone Therapy	32,760.00	2.0%	180,000.00	10.0%
Radiotherapy	88,150.00	5.4%	88,150.00	4.9%
Total	1,644,947.48		1,792,187.35	

there was a need to validate the procedures and treatments data earlier collected.

The Clinical Practice guide on breast cancer approved later part this year in 2022, also recommends considerations in cost. The Guidelines Development Group (GDG) recommends a conduct of a systematic review or meta-analysis on the cost-effectiveness or cost-benefit of minimally invasive technique in the diagnosis of breast lesions.[16] The diagnosis needs to include baseline comprehensive laboratory tests and costs will have to be considered in terms of affordability for the patients.

PhilHealth has an existing Relative Value System (RVS) that the hospitals use. However, the RVS developed in 2000 and the Peso Conversion Factor (PCF) was not updated and therefore new and latest surgical procedures used by the hospitals are not incorporated in the PhilHealth RVS.

CONCLUSION

Cost is the resources spent to generate the benefits and generally considered a more valid estimate of resources utilized.[17] The calculation of actual costs for resources spent is not an easy procedure and commonly is based on best estimates, averages or common practice by the healthcare professionals and institutions. Assessing the true cost and justifiable cost of medical care is very difficult.

Implementing a sophisticated costing system for catastrophic and expensive illnesses like breast cancer can be too costly. Costing of individual services highly depends critically on the allocation of overhead to individual services as well as clear understanding of the medical services cost centers.

Medical care costs for cancer are projected to increase tremendously considering the development of newest therapies and sophisticated diagnostic procedures.

Given that new therapies and sophisticated procedures will eventually be developed for cancer care, costing should further be adjusted.

To lower down health expenditure costs on the treatment of cancer, there is a need to set up a budget for screening and assessment so that patients can be diagnosed at an earlier stage which reduces the cost of treatment.

It is imperative for the government to consider dividing cancer care into phases; initial (first year after diagnosis), end-of-life (year before cancer death), and continuing (time in between) to ensure quality of life and appropriate medical care are provided to cancer patients. Having said that, the burden of cancer will lead to an overwhelming national expenditure. It is therefore appropriate that the DOH and PhilHealth establish an evidence-based, regularly updated, scientific method of approaching cost.

Each health facility, or hospital providing care for breast cancer, needs to have their own cost data library that is integrated, interoperable, and comprehensive. PhilHealth will need to guide the health care providers of their costing method: should it be step-down costing or bottom-up costing to be applied for easy comparison of intensive unit costs between hospitals.

The existence of updated national CPG for all types of breast cancer and stages are essential. The CPG will later be translated into Clinical Pathway for which all steps and units of care will be costed.

To ensure safe, appropriate, and cost-effective technologies are used in the treatment of breast cancer and ensuring quality of life of cancer patients, health technology assessment should be applied in the development of CPG breast CA considering the significant advances in cancer therapeutics in the last decade. From chemotherapies to targeted therapies and more recently immuno-oncology.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

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APPENDICES

Breast cancer by stages, PhilHealth RVS codes for breast CA-related surgical procedures, and Radiation oncology case rates

Table 1. Breast Cancer by Stages

Stages	Description
Stage 0	The disease is localized to the milk ducts (ductal carcinoma in-situ)
Stage I	The tumor is less than cm and hasn't spread anywhere nor involves the lymph nodes.
Stage IIA, IIB	The tumor is less than 2 cm across but has spread to the underarm lymph nodes (IIA). The tumor is between 2 and 5 cm (with or without spread to the lymph nodes). The tumor is larger than 5 cm and has not spread to the lymph nodes under the arm (both IIB)
Stage IIIA, IIIB	In Stage IIIA, the tumor is any size with cancerous lymph nodes that adhere to one another or to surrounding tissue Stage IIIB breast cancer is a tumor of any size that has spread to the skin, chest wall, or internal mammary lymph nodes (located beneath the breast and inside the chest).
Stage IV	A tumor, regardless of size, has spread to areas away from the breast, such as bones, lungs, liver, or brain.

Table 2. PhilHealth RVS Codes for Breast CA-related Surgical Procedures

RVS Code	Description	Case Rate
19000	Puncture aspiration of cyst of breast	3,640
19020	Mastectomy with exploration or drainage of abscess, deep	9,700
Excision		
19100	Biopsy of breast; needle core	3,640
19101	Biopsy of breast; incisional	5,560
19110	Nipple exploration, w/ or w/o excision of a solitary lactiferous duct or a papilloma lactiferous duct	8,440
19112	Excision of lactiferous duct fistula	8,260
19120	Excision of cyst, fibroadenoma, or other benign or malignant tumor aberrant breast tissue, duct lesion or nipple lesion (except 19140), male or female, one or more lesions	8,020
19125	Excision of breast lesion identified by preoperative placement of radiological marker; single lesion	8,020
19140	Mastectomy for gynecomastia	22,000
19160	Mastectomy, partial	22,000
19162	Mastectomy, partial with axillary lymphadenectomy	22,000
19180	Mastectomy, simple, complete	22,000
19182	Mastectomy, subcutaneous	22,000
19200	Mastectomy, radical, including pectoral muscles, axillary lymph nodes	22,000
19220	Mastectomy, radical, including pectoral muscles, axillary, and internal mammary lymph nodes (Urban type operation)	22,000
19240	Mastectomy, modified radical, including axillary lymph nodes, w/ or w/o pectoralis minor muscle, but excluding pectoralis major muscle	22,000
19260	Excision of chest wall tumor including ribs	46,500
19271	Excision of chest wall tumor involving ribs, w/ plastic reconstruction; w/o mediastinal lymphadenectomy	55,000
19272	Excision of chest wall tumor involving ribs, w/ plastic reconstruction; w/ mediastinal lymphadenectomy	58,800
19340	Immediate insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction	37,800
19342	Delayed insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction	37,800
19350	Nipple/areola reconstruction	30,300
19357	Breast reconstruction, immediate or delayed, with tissue expander, including subsequent expansion	37,000
19361	Breast reconstruction with latissimus dorsi flap, with or without prosthetic implant	55,000
19364	Breast reconstruction with free flap	55,000
19366	Breast reconstruction with other technique	55,000
19367	Breast reconstruction with transverse rectus abdominis myocutaneous flap (TRAM), single pedicle, including closure of donor site	55,000
19369	Breast reconstruction with transverse rectus abdominis myocutaneous flap (TRAM), double pedicle, including closure of donor site	55,000
19370	Open periprosthetic capsulotomy, breast	30,300
19371	Periprosthetic capsulectomy, breast	37,800

Table 3. Radiation Oncology Case Rates

RVS Code	Description	Total Case Rate
Clinical Treatment Planning (External and Internal Sources)		
77261	Therapeutic radiology treatment planning; simple, intermediate, or complex (Only one may be reported for a given course of therapy)	18,000
Radiation Oncology		
77401	Radiation treatment delivery (Linear Accelerator)	3,000
77401	Radiation treatment delivery (Cobalt)	2,000
77418	Intensity modulated treatment delivery, single or multiple fields/arcs, via narrow spatially and temporally modulated beams, binary, dynamic MLC per session	5,680
77421	Stereoscopic X-ray guidance for localization of target volume for the delivery of radiation therapy	30,300