



Published: June 30, 2024

Citation: Ting FIL, Uy CD, et al., 2024. Current Landscape of Patients with Metastatic Cancers in the Philippines, Medical Research Archives, [online] 12(6).

<https://doi.org/10.18103/mra.v12i6.5408>

Copyright: © 2024 European Society of Medicine. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

DOI

<https://doi.org/10.18103/mra.v12i6.5408>

ISSN: 2375-1924

EDITORIAL

Current Landscape of Patients with Metastatic Cancers in the Philippines

Frederic Ivan L. Ting, MD^{1,2,*}; Crizel Denise Uy, MD³; Carlo Miguel P. Berba, MD⁴; Dennis L. Sacdalan, MD⁵

1. Department of Clinical Sciences, University of St. La Salle - College of Medicine, Bacolod City, Philippines 6100
2. Section of Medical Oncology, Department of Medicine, Corazon Locsin Montelibano Memorial Regional Hospital, Bacolod City, Philippines 6100
3. Section of Medical Oncology, Department of Medicine, San Juan De Dios Hospital, Manila, 1000, Philippines
4. Pfizer, Inc. Makati City, 1210, Philippines
5. Department of Medicine, Division of Medical Oncology, University of the Philippines – Philippine General Hospital, Manila, 1000, Philippines

* **Corresponding Author:** f.ting@usls.edu.ph

ABSTRACT

Globally, cancer imposes an extensive burden in terms of both epidemiology and financial adversity. Treating cancer remains a challenge despite outstanding development in the field of molecular oncology. The introduction of sophisticated imaging and diagnostic technologies and novel targeted therapies are leading to expensive treatment which is unaffordable to most patients. These challenges strain the already weak healthcare and economic infrastructure of the low- and middle-income countries, where resources are already constrained and access to health care is suboptimal. Thus, it is critical to focus on the prevention strategies that intend to control the rising burden of cancer. Screening programs have long been proven to be cost-effective in reducing cancer mortality by detecting malignancies at earlier asymptomatic stages and thus should be on top priority in the public health agenda of the Philippines. This review paper aims to explore the status of metastatic cancers in the country, including its epidemiology, the current diagnostic and treatment landscape, and future directions to reduce the cancer burden.

Keywords: Metastatic cancer, Cervical, Colorectal, Liver, Breast, LMICs, Philippines, Insurance

Abbreviations

ACTION – Association of Southeast Asian Nations Costs in Oncology
CBE – Clinical Breast Examination
COVID-19 – Novel Coronavirus Disease – 2019
CRC – Colorectal Cancer
EGFR – Epidermal Growth Factor Receptor
FOBT – Fecal Occult Blood Test
gFOBT – guaiac Fecal Occult Blood Test
HBV – Hepatitis B Virus
HER2 – Human Epidermal Growth Factor Receptor 2
HICs – High Income Countries
HPV – Human Papilloma Virus
LMICs – Low- and Middle-Income Countries
NICCA – National Integrated Cancer Control Act
NSCLC – Non-Small Cell Lung Carcinoma
PESO – Philippine Costs in Oncology
WHO – World Health Organization

Introduction

A cancer diagnosis imposes significant burden to the patient, the family, and the society. This includes not only physical and emotional difficulties but also psychological and financial challenges. The burden is even greater for patients diagnosed with metastatic cancer. This paper explores the current landscape of patients with metastatic cancers in the Philippines and presents some recommendations to address the identified challenges.

Present Epidemiology

There are limited studies on the epidemiology of metastatic cancers in the Philippines. In the Association of Southeast Asian Nations Costs in Oncology (ACTION) Study which looked into the association between catastrophic health expenditure and 12-month mortality among patients with cancer in Southeast Asian countries involving 9,513 respondents, the prevalence of metastatic cancer was 24%.¹ On the other hand, in the Philippine Costs in Oncology (PESO) study which examined the economic impact of cancer on Filipino patients involving 909 respondents, it was noted that 20.7% had metastatic cancer.²

The top three cancers in terms of incidence in the Philippines according to 2022 data from the World Health Organization (WHO) and GLOBOCAN are cancers of the breast (17.5%), lung (12.6%), and colorectum (11%).³

For patients with breast cancer, studies show that the incidence of metastatic disease ranges from 11-31%.⁴⁻⁷ For lung cancer, data from the registry of the Lung Center of the Philippines for the year 2000 - 2008 shows that among 7,389 patients, 64.8% have been diagnosed with metastatic disease.⁸ For

colon cancer, two studies show that 33 – 37% of patients present with metastatic disease.⁹⁻¹⁰

The Philippine statistics show that among patients with breast and colon cancer, one-third are diagnosed with de novo metastatic disease while patients with lung cancer have metastatic disease upon initial consult approximately two-thirds of the time. These numbers are much higher than the incidence rates in developed countries which document metastatic disease in 6%, 20%, and 55% of breast, colorectal, and lung cancers respectively.¹¹

Compared to developed regions, the incidences of mortality and financial catastrophe in the Philippines resulting from cancer are high.¹ GLOBOCAN data shows mortality rates for breast, lung, and colorectal cancer in the Philippines are high at 36.5%, 88.9%, and 54% respectively.³ In contrast, mortality rates from developed regions such as the USA are only 16.8% for breast, 60.6% for lung, and 37.2% for colorectal.¹² Based on their clinical practice, the oncologists imply that multiple factors such as delayed cancer detection, geospatial limitations precluding access to specialists, large out-of-pocket treatment expenses, and suboptimal healthcare infrastructure contribute to the increased risk of adverse outcomes among low- and middle-income countries (LMICs).

Moreover, social conditions resulting from the COVID-19 pandemic have worsened an already burdensome situation. Movement and travel restrictions that limit access to hospitals, heightened economic strains from prolonged unemployment, and highly congested hospital facilities ultimately resulted to further delays in cancer care. These care gaps significantly affect the patient's chances of survival and their quality of life.

Current Diagnostic and Treatment Landscape

According to the clinicians' practice, one of the greatest challenges in the management of metastatic cancer patients in the Philippines is the patients' inequitable access to multidisciplinary team conferences, palliative radiation therapies, life-prolonging systemic chemotherapeutic or targeted drugs, and palliative and supportive care. In a country with high rates of out-of-pocket expenses resulting from suboptimal health and cancer care infrastructure, financial difficulty is often faced due to the disease or its associated morbidities.

In 2015, the ACTION study, which involved low- and middle-income countries including the Philippines,

reported that 48% of the households with a member newly diagnosed with cancer faced financial catastrophe within the first year of treatment.¹ The financial catastrophe was defined as out-of-pocket costs of at least 30% of household income spent on treatment within the year of any cancer diagnosis.¹

Subsequently, the Philippine Costs in Oncology (PESO) study was conducted using the Philippine data set from the ACTION study to investigate the risk of financial catastrophe among Filipinos in the setting of a newly diagnosed cancer. PESO reported that 40.6% of households faced financial catastrophe after a cancer diagnosis.² This study highlighted the suboptimal government support for Filipinos in covering the costs necessary for the basic treatment of patients with cancer.²

Multiple studies from Asia reported that even patients with universal health coverage schemes faced financial adversities owing to cancer treatment and care. At least 25% of patients with cancer in Thailand reported high out-of-pocket expenses. Furthermore, up to 75% of these patients in India reported out-of-pocket expenses.¹³

In the US population, Medicare beneficiaries with newly diagnosed cancer incurred out-of-pocket expenses that were 23.7% of their household income. Around 10% of these beneficiaries incurred expenses that were more than 60% of their household income, and over 40% of these expenses were due to hospitalizations.¹⁴ In another study from the USA which involved 1,202 adult cancer survivors, 20.4% of the survivors experienced financial hardships.¹⁵ The magnitude of financial hardships witnessed by the HICs is less compared to the LMICs.

In 2015, there were 19 anti-cancer medications that were not included in the WHO's list of essential medicines: Lapatinib, pertuzumab, and trastuzumab emtansine (TDM-1; breast cancer); erlotinib, gefitinib, afatinib (EGFR-mutated NSCLC), crizotinib (ALK/ROS1 rearranged NSCLC); cetuximab and panitumumab (RAS/RAF wild-type colorectal cancer); sunitinib, pazopanib, axitinib, sorafenib, everolimus and temsirolimus (renal cell cancer); ipilimumab and vemurafenib (cutaneous melanoma) and abiraterone and enzalutamide (castration-resistant prostate cancer). In most LMICs, these medicines were not frequently available at lower costs. In some countries, it was not available at all due to suboptimal accessibility or non-approval by national regulatory agencies. Contrarily, higher out-of-pocket expenditures were less frequently experienced by the population of

HICs since these medications were included in the national formulary.¹³

In response to this problem, the Philhealth Z-package benefit program was created by the Philippine Department of Health to help reduce the cost of cancer treatment. The current existing programs finance the treatment of patients with early-stage or locally advanced breast or colorectal cancers. Unfortunately, patients with metastatic cancers are excluded from the program, resulting in limited therapeutic options for this cohort. While the Philhealth Z-package program undoubtedly has benefitted many Filipino patients afflicted with non-metastatic cancer, a significant proportion of metastatic patients are profoundly lacking in support in a time when life-prolonging medicines are available.¹⁶⁻¹⁷

Other funding sources for patients with metastatic cancers are from charitable foundations and government offices such as the Andres Soriano Foundation, Philippine Cancer Society, Philippine Charity Sweepstakes Office, Philippine Amusement and Gaming Corporation, Department of Social Welfare and Development, and the offices of government officials and politicians.¹⁸ Based on the data gathered from clinicians' practice, once the patient's application for cancer treatment funding is approved, they can receive between 10,000 to 20,000 PHP (approximately 200-400 USD) every 3 months on the average. This is a relatively large amount for the underprivileged but only a minute fraction of the total cost of comprehensive cancer care. This financial barrier significantly contributes to health inequity as evidenced by the inability of the majority of Filipino patients with cancer to avail novel diagnostic and treatment options such as genetic testing, immunotherapy, and other targeted treatments.

In the Asian population, high levels of pathogenic mutations of epidermal growth factor receptor (EGFR) are observed in up to 50% of patients with advanced NSCLC. There is an evident need for EGFR-targeted therapy with tyrosine-kinase inhibitors in these patients. However, the dearth of molecular testing is a hindrance to the appropriate use of these therapies. A global survey-based study reported that only 40% of 49 countries have access to EGFR testing. An uneven availability was reported in Southeast Asian countries, where the testing facilities were available only in selected centers across the countries.¹³

One study shows that in actual practice, only 68% of Filipino medical oncologists do EGFR testing in patients with lung adenocarcinoma. The most cited barrier to the standard use of biomarkers is financial constraints which have been encountered

95% of the time.¹⁹ Knowing the significant benefits of targeted treatment, including improved progression-free and overall survival rates with enhanced quality of life, it is truly unfortunate for Filipino cancer patients to be denied access.

Lack of resources to perform a timely diagnosis of cancer is a major hindrance to optimal cancer care. Access to cancer prevention programs and early diagnosis are substandard in many regions of the world. The appalling quality of cancer registries in LMICs results in an evident knowledge deficit and adversely impacts the delivery of suitable cancer care.²⁰

The burden of lung cancer in Asian countries is responsible for nearly 20% of cancer mortality. Asian countries also have the highest global rates of EGFR mutations. Therefore, the availability of quality and effective EGFR-targeted therapies is of public health interest. In places where EGFR-targeted therapies are indeed available, the unaffordability or availability of these therapies at exorbitant costs results in calamitous personal health expenses.¹³

In a survey-based study, pertuzumab was not available in 3 out of 18 Asian countries.¹³ As per the clinical trial data, this is speculated to have a serious impact on HER2-overexpressing advanced breast cancer patients wherein they experienced the loss of approximately 15.7 months of median survival.²¹

The inability to maximize the advancements in cancer diagnostics and treatment clearly has implications for patient outcomes. In fact, one study reports that the breast cancer five-year survival rate of populations from economically developing Asian countries such as the Philippines is estimated to be about 50% or less compared with the 75% five-year survival rate of patients from more progressive nations such as Singapore, South Korea, and some parts of China.²²

Access to affordable cancer treatment using radiotherapy, targeted therapy, and chemotherapy is yet another major encumbrance of global cancer control. Furthermore, the scarce availability of healthcare professionals is a tremendous challenge that contributes to gaps in cancer healthcare. In a comprehensive survey of 93 countries, around 27 countries (25 in Africa and 2 in Asia) had one clinical oncologist for every >1000 new cases of cancers. In Honduras, there are fewer than 20 oncologists for an 8 million population. In Ethiopia, there are 4 oncologists for more than 80 million people. Improving the availability of clinical oncologists may not lead to improved quality of

cancer care. Nonetheless, it can lead to easier access to trained healthcare professionals which will have a positive impact on the cancer dynamics of society.²⁰ In Asia, the mortality-to-incidence ratio was >70% in five countries. None of the countries in Europe or America had a ratio of >70%. In Africa, the mortality-to-incidence ratio was > 70% in 21 countries. The mortality-to-incidence ratio is closely related to the economic and social development status of the country.²⁰

One review shows that over two-thirds of cancer mortalities are in LMICs, and this proportion is expected to increase in the coming years. Moreover, LMICs account for 80% of disability-adjusted life-years (DALYs) lost to cancer globally—an alarming number for global health inequity from a cancer care perspective.²³

One of the most important aspects in reducing cancer mortality is the availability and access to innovative and life-saving cancer drugs.²⁴ In studies that analyze the global consumption of novel cancer agents, there are apparent and unfortunate discrepancies that highlight health inequity in cancer care. Access to new cancer medicines is conveniently utilized by Western countries like the US and Europe, while the majority of Filipinos have limited access to innovative cancer care due to a multitude of factors such as underfunded healthcare systems, high cost of treatments, and complex sociocultural dynamics.

With regards to palliative and supportive care in the country, up to 75% of patients with cancer still suffer from inadequate pain relief. And this is primarily due to a hindered access to palliative care because of limited specialist workforce, high out-of-pocket costs, and low opioid availability.²⁵

Finally, the role of multidisciplinary team (MDT) care in the care of the Filipino cancer patient is an aspect of care that has yet to be fully realized in terms of national level adoption. MDTs or multidisciplinary care has been growing in its application, with special benefit for tumor types with multiple available treatment paradigms and complex decision-making considerations.²⁶

However, low- and middle-income countries have been seen to have challenges in activating multidisciplinary teams, leading some to propose innovative methodologies in approaching MDT enablement.²⁷ In the Philippines, it is unfortunately not routinely available in most hospitals treating patients with cancer and may be costly to activate.²⁸⁻²⁹ Clinicians experience in their practice mirror the experience of other LMIC,²⁷ where scarcity of experienced specialists, fragmentation

of the healthcare referral systems, and limited human resources, remain barriers to MDT adoption. Although local specialist societies including, but not limited to medical oncologists, radiation oncologists, and surgeons and multispecialty societies, are persistent in their encouragement of their members to establish practice of MDT in their institutions.

Future Directions

Optimal management of metastatic cancers requires a holistic and patient-centric approach. While systemic treatment comprises an important aspect of management, other concepts such as palliative care, pain management, nutrition, and the patient's spiritual and psychosocial well-being remain to be key components that are often deprioritized. A multi-disciplinary approach in cancer care, to include cooperation from co-managing subspecialties like surgical and radiation oncology, palliative care, and mental health specialists provide more integrated modalities of treatment that are tailored to the patient's needs and desires during this course of disease.

Moreover, cancer screening and prevention strategies would significantly help reduce the incidence and mortality due to metastatic cancers.³⁰ However, such programs are sorely lacking in the Philippines.

PREVENTION STRATEGIES FOR CERVICAL AND LIVER CANCER

Around 26% of cancers in LMICs are attributed to infection. The implementation of vaccines against Hepatitis B virus (HBV) and Human papilloma virus (HPV) is a crucial step to protect the population of LMICs against major cancers.³¹ Vaccination with HPV is a cost-effective preventive measure for cervical cancer. However, implementing these vaccination programs in LMICs is economically challenging.³²

HPV vaccination has been implemented in several other sub-Saharan African countries like Botswana and Zambia, despite various challenges. Strong commitment from the national governments along with improved community awareness has resulted in high vaccine coverage in these countries.³² Overcoming the social challenges has been proven achievable by Rwanda despite being one of the LMICs in the world. Rwanda successfully implemented the HPV vaccination program that led to the immunization of more than 96% of eligible girls. This feat was a result of community and government leadership combined with vaccine manufacturer support and extensive social mobilization.³³ In 1984, the government of Taiwan launched a national HBV vaccination program for

infants. The implementation of the universal HBV vaccination program demonstrated that the surface antigen of HBV carrier prevalence decreased from 15-20% to <1%. Importantly, a decrease from 0.67 to 0.19 per 100 000 children was observed in the annual incidence of liver cancer.³¹

PREVENTION STRATEGIES FOR BREAST CANCER

In LMICs, two-thirds of breast cancer cases are detected at the advanced stage. Preventive strategies that employ early detection methods of breast cancer like screening through mammography, clinical breast examination and breast self-examination should be practiced.³¹

A randomized controlled trial of clinical breast examination (CBE) for breast cancer screening was conducted in Manila in 1995. However, compliance with referral among women who were detected to have a breast lump was only 21%. Additionally, attempts made to improve compliance were not successful owing to which the trial was discontinued. Mammography screening is expensive and utilizes manpower resources because of which it is less feasible in most LMICs.³⁴ On the contrary, other Asian countries have shown benefits of conducting CBE. A randomized clinical trial was conducted in India to assess the use of triennial CBE in reducing the rate of advanced breast cancer and associated mortality. In this trial, 115,652 women between the ages of 30-69 were randomly assigned to receive either CBE or no screening. Trained community workers functioned as a liaison between healthy women and physicians and conducted the CBE. It was reported that more cases of early-stage breast cancers were detected in the CBE group versus the group that underwent no screening (18.8 vs 8.1 per 100,000 women, respectively).³⁵

The Philippine Department of Health has established the Breast Cancer Control Program (BCCP) which is a nationwide anti-breast cancer program to create awareness by the amalgamation of public information, health education, and treatment into the community health structure. However, the implementation of this program has been suboptimal with only 5.6 mammography machines available per 10,000 cancer patients.³⁶

PREVENTION STRATEGIES FOR COLORECTAL CANCER

Screening for colorectal cancer (CRC) is commonly performed with a fecal occult blood test (FOBT). The most widely used FOBT is based on a biochemical test called the guaiac test (gFOBT).³⁷ A study conducted in Minnesota observed a 33% reduction in colorectal cancer mortality in patients who underwent gFOBT screening followed by

colonoscopy. The gFOBT was performed yearly in these patients. Additionally, the study showed that the reduction in mortality was 21% if the gFOBT was performed at 2-year intervals. A similar study conducted in the UK reported that there was a 13% reduction in CRC mortality.³⁷

However, implementing the CRC screening program is possible only in economically developed countries.³⁸ Some developed countries like the US, Japan, France, and Iceland have witnessed a reduction in the incidence and mortality of CRC owing to the implementation of successful prevention and treatment programs.³⁸⁻³⁹

A review was conducted to assess the implementation of CRC screening interventions in LMICs. The review found that the major challenges to the implementation were the infrastructure of the health care system, financial resources, government commitment, staff resources, and training, and knowledge about CRC and screening.⁴⁰

Thus, a multi-pronged approach to address the problem is needed: legislation and effective implementation, a collaboration between the government and private sector, widening of insurance coverage, and education on health and financial literacy among others.

INSURANCE COVERAGE IN THE PHILIPPINES

In February 2019, the Universal Health Care Bill was signed into law as part of the massive reforms in the Philippine health sector. This bill automatically enrolls all Filipino citizens into the National Health Insurance Program (PhilHealth). The National Integrated Cancer Control Act (NICCA) was also signed in the same month. This law aims to improve cancer survivorship by strengthening essential programs such as the establishment of a Philippine Cancer Center and Regional Cancer Centers across the archipelago.¹⁸

Furthermore, the law tackles the present financial catastrophe being experienced by most Filipino patients with cancer, by availing the cancer assistance fund to help pay for treatment, expanding PhilHealth benefit packages in cancer, training more oncology professionals, and supporting bigger cancer awareness campaigns.¹⁸

Apart from the enforcement of policies that improve the provision of health care, additional efforts may be done to further curb financial toxicities resulting from a cancer diagnosis. The introduction of financial navigation programs that focus on financial literacy, optimizing health insurance, and connecting patients to available financial resources

may be helpful to combat the financial impact of this disease.⁴¹

Conclusions

Cancer is recognized to be one of the leading causes of morbidity and mortality worldwide, with LMICs suffering disproportionately in terms of outcomes and access to cancer care.⁷ With the 30-40% incidence of metastatic cancer in the Philippines, the de-prioritization of this cohort from government policies that ensure access to standard-of-care medicines need re-evaluation. Although metastatic cancers are generally incurable, patients may still remain functional and productive with a relatively good quality of life if their disease is controlled with medications. Several studies have already shown that with the advent of novel treatment modalities, control of the patients' cancer is achievable, prolonging their survival and delaying tumor progression significantly.⁴²⁻⁴⁶

The effective use of telehealth services has been spurred during the COVID-19 pandemic in many countries. The role of telehealth services could be expanded to providing cancer care and palliative care services to the patients in LMICs.⁴⁷ Practical solutions to control the cost of cancer treatment for both payers and patients should be devised. Several factors with respect to patients, care providers, the pharmaceutical industry, and policymakers should be addressed to find a reasonable solution that will help tackle the problem of high costs leading to financial adversity.⁴⁸

In terms of research, the NICCA can significantly provide policy-changing data through the establishment of cancer registries. The generation of data not only regarding cases of cancer but also the availability of cancer services from diagnosis, treatment, up to palliative and supportive care would also help the government streamline their plans to address the geographical inequalities brought about by the archipelagic nature of the country.

Additionally, cancer prevention programs through education and awareness campaigns are a crucial part of the armamentarium to fight against cancer. Current evidence has shown that successful implementation of these programs can prove instrumental in reducing both the incidence of cancer and mortality. However, a critical issue that warrants attention is the adherence to these programs.⁴⁹

We have always been fighting against discrimination and inequality. Perhaps it is about

time that Filipino patients with metastatic cancer to be given a fighting chance.

Author Contributions: All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this article, take responsibility for the integrity of the work as a whole, and have given their approval for this version to be published. All authors contributed to the conception and design of the article, interpreting the relevant data, drafting the manuscript, and/or critically revising the manuscript for intellectual contribution.

Data Availability Statement: Data sharing

is not applicable to this article as all data included are publicly available in the cited sources.

Acknowledgments: The authors would like to acknowledge Nehali Save (Medical Excellence, Emerging Markets, Pfizer Ltd.) for providing medical writing and editorial support.

Conflicts of Interest: Carlo Miguel P. Berba is an employee of Pfizer Inc, and may hold stock/stock options. Frederic Ivan Ting, Crizel Denise Uy, and Dennis Lee Sacdalan have no conflicts of interest to report.

References

1. Kimman M, Jan S, Yip CH, Thabrany H, Peters SA, Bhoo-Pathy N, et al. Catastrophic health expenditure and 12-month mortality associated with cancer in Southeast Asia: results from a longitudinal study in eight countries. *BMC Med.* 2015;13:190. Doi: 10.1186/s12916-015-0433-1
2. Ngelangel C, Lam H, Rivera A, Kimman M, Real I, Balete S. Philippine Costs in Oncology (PESO): Describing the Economic Impact of Cancer on Filipino Cancer Patients Using the ASEAN Costs in Oncology Study Dataset. *Acta Medica Philippina.* 2018;52:125-33.
3. WHO. The Globocan Cancer Observatory, Philippines Fact Sheet. WHO; 2022.
4. De Leon Matsuda ML, Leide A, Kwan E, Mapua CA, Cutiongco EM, Tan A, et al. BRCA1 and BRCA2 mutations among breast cancer patients from the Philippines. *Int J Cancer.* 2002;98:596-603.
5. Laudico A RM, Lumague M. Epidemiology and Clinicopathology of Breast Cancer in Metro Manila and Rizal Province, Philippine. *Asian Pacific Journal of Cancer Prevention.* 2009;10:167-72.
6. Ortiz A Jr, Fojas M Jr, Javier B, De Villa M, & Eufemio G. A five-year study of 640 consecutive cases of breast cancer among Filipinos. *Philippine Journal of Surgical Specialties.* 1971;000.
7. Redaniel MT, Laudico A, Mirasol-Lumague MR, Gondos A, Uy GL, Mapua C, et al. Breast cancer survival in different country settings: comparisons between a Filipino resident population, Filipino-Americans and Caucasians. *Breast.* 2010;19(2):109-14. Doi: 10.1016/j.breast.2009.12.004
8. Monograph on Lung Cancer: Lung Cancer Registry Data of 2000 – 2008. Lung Center of the Philippines 2008.
9. Sacdalan DB, Lucero JA, Ting FI, Sacdalan DL. What Will Keep Me Coming Back to the Clinic: Factors Identified by Filipino Colorectal Cancer Patients Seen at a National Academic Referral Center. *J Patient Exp.* 2020;4:460-3.
10. Sacdalan DL, Garcia RL, Diwa MH, Sacdalan DB. Clinicopathologic Factors Associated with Mismatch Repair Status Among Filipino Patients with Young-Onset Colorectal Cancer. *Cancer Manag Res.* 2021;13:2105-15.
11. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2020. *CA Cancer J Clin.* 2020;70:7-30.
12. WHO. The Globocan Cancer Observatory, United States of America Fact Sheet. 2021.
13. Eniu A NC, Bertram M, Thongprasert S, Douillard J, Bricalli G, et al. Cancer medicines in Asia and Asia Pacific: What is available, and is it effective enough? *ESMO Open.* 2019;4(e000483):1-12.
14. Narang AK, Nicholas LH. Out-of-Pocket Spending and Financial Burden Among Medicare Beneficiaries With Cancer. *JAMA Oncol.* 2017;3:757–65.
15. Yabroff KR, Dowling EC, Guy GP, Jr., Banegas MP, Davidoff A, Han X, et al. Financial Hardship Associated With Cancer in the United States: Findings From a Population-Based Sample of Adult Cancer Survivors. *J Clin Oncol.* 2016;34(3):259-67. Doi: 10.1200/JCO.2015.62.0468
16. Philippine Department of Health Circular 2015-035 - The Guiding Principles of the Z Benefits [Internet]. [cited 18 Oct 2022]. Available from: <https://www.philhealth.gov.ph/circulars/2015/circ035-2015.pdf>.
17. Philippine Department of Health Circular 2021-0022 - The Guiding Principles of the Z Benefits – Revision 1 [Internet]. [cited 18 Oct 2022]. Available from: <https://www.philhealth.gov.ph/circulars/2021/circ2021-0022.pdf>
18. Cancer in My Community: Overcoming Cancer Care Barriers in the Philippines [Internet]. 2019 [cited 15 Oct 2022]. Available from: <https://www.cancer.net/blog/2019-06/cancermy-community-overcoming-cancer-care-barriers-philippines>.
19. Catedral LI, Tan HN, Chua A Jr, Sacdalan DB, Sacdalan DL. Patterns of Biomarker Use in Cancer Treatment Among Medical Oncologists in the Philippines. *JCO Glob Oncol.* 2020 6:1593-608.
20. Mathew A. Global Survey of Clinical Oncology Workforce. *J Glob Oncol.* 2018;4:1-12. Doi: 10.1200/JGO.17.00188
21. Swain SM, Baselga J, Kim SB, Jungsil Ro, Semiglazov V, Campone M, et al. Pertuzumab, Trastuzumab, and Docetaxel in HER2-Positive Metastatic Breast Cancer. *N Engl J Med.* 2015;372:724-34.
22. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. *CA Cancer J Clin.* 2011;61(2):69-90. Doi: 10.3322/caac.20107
23. Pesec M, Sherertz T. Global health from a cancer care perspective. *Future Oncol.* 2015;11(15):2235-45. Doi: 10.2217/fon.15.142
24. Barrios CH, Reinert T, Werutsky G. Access to high-cost drugs for advanced breast cancer in Latin America, particularly trastuzumab. *Ecancermedicalscience.* 2019;13:898. Doi: 10.3332/ecancer.2019.898

25. Ho FDV, De Luna DV, Cubarrubias DLPF, et al. Palliative and Supportive Care in the Philippines: Systems, Barriers, and Steps Forward [published online ahead of print, 2023 Feb 5]. *J Palliat Care*. 2023;8258597231153381. Doi:10.1177/08258597231153381
26. Taberna M, Gil Moncayo F, Jane-Salas E, et al. The Multidisciplinary Team (MDT) Approach and Quality of Care. *Front Oncol*. 2020;10:85. Doi:10.3389/fonc.2020.00085
27. Eaton V, Zambrano A, Sanabria V, et al. Innovative Methodology for Strengthening a Multidisciplinary Team Approach in Cities in Low- and Middle-Income Countries. *JCO Glob Oncol*. Oct 2022;8:e2200149. Doi:10.1200/GO.22.00149
28. Ting FIL, Sacdalan DBL, Tampo MMT, et al. Treatment Outcomes of Patients With Colorectal Cancer Enrolled in a Comprehensive Benefits Program of the National Insurance System in the Philippines: Data From the Pilot Site. *JCO Glob Oncol*. 2020;6:35-46. Doi:10.1200/JGO.19.00332
29. Ting FI, Uy CD, Bebero KG, et al. Choosing Wisely Philippines: ten low-value or harmful practices that should be avoided in cancer care. *Ecancermedalscience*. 2022;16:1424. Published 2022 Jul 7. Doi:10.3332/ecancer.2022.1424
30. Beaglehole R, Bonita R, Magnusson R. Global cancer prevention: an important pathway to global health and development. *Public Health*. 2011;125(12):821-31. Doi: 10.1016/j.puhe.2011.09.029
31. Sankaranarayanan R, Boffetta P. Research on cancer prevention, detection and management in low- and medium-income countries. *Annals of Oncology*. 2010;21:1935-43.
32. Kamaraju S, Drope J, Sankaranarayanan R, Shastri S. Cancer Prevention in Low-Resource Countries: An Overview of the Opportunity. *Am Soc Clin Oncol Educ Book*. 2020;40:1-12. Doi: 10.1200/EDBK_280625
33. Allanson ER, Schmeler KM. Cervical Cancer Prevention in Low- and Middle-Income Countries. *Clin Obstet Gynecol*. 2021;64(3):501-18. Doi: 10.1097/GRF.0000000000000629
34. Pisani P, Parkin DM, Ngelangel C, Esteban D, Gibson L, Munson M, et al. Outcome of screening by clinical examination of the breast in a trial in the Philippines. *Int J Cancer*. 2006;118(1):149-54. Doi: 10.1002/ijc.21343
35. Sankaranarayanan R, Ramadas K, Thara S, Muwonge R, Prabhakar J, Augustine P, et al. Clinical breast examination: preliminary results from a cluster randomized controlled trial in India. *J Natl Cancer Inst*. 2011;103(19):1476-80. Doi: 10.1093/jnci/djr304
36. Ho FDV, Arevalo MVP, de Claro PTS, Jacomina LE, Germar MJV, Dee EC, et al. Breast and cervical cancer screening in the Philippines: Challenges and steps forward. *Preventive Medicine Reports*. 2022;29(101936):1-3.
37. Altobelli E, Lattanzi A, Paduano R, Varassi G, di Orio F. Colorectal cancer prevention in Europe: burden of disease and status of screening programs. *Prev Med*. 2014;62:132-41. Doi: 10.1016/j.ypmed.2014.02.010
38. Tarraga Lopez PJ, Albero JS, Rodriguez-Montes JA. Primary and secondary prevention of colorectal cancer. *Clin Med Insights Gastroenterol*. 2014;7:33-46. Doi: 10.4137/CGast.S14039
39. Rawla P, Sunkara T, Barsouk A. Epidemiology of colorectal cancer: incidence, mortality, survival, and risk factors. *Prz Gastroenterol*. 2019;14(2):89-103. Doi: 10.5114/pg.2018.81072
40. Schliemann D, Ramanathan K, Matovu N, O'Neill C, Kee F, Su TT, Donnelly M. The implementation of colorectal cancer screening interventions in low-and middle income countries: a scoping review. *BMC Cancer*. 2021;21:1125. Doi: 10.1186/s12885-021-08809-1
41. Kong YC, Sakti VV, Sullivan R, Bhoo-Pathy N. Cancer and COVID-19: economic impact on households in Southeast Asia. *Ecancermedalscience*. 2020;14:1134. Doi: 10.3332/ecancer.2020.1134
42. Caswell-Jin JL, Plevritis SK, Tian L, Cadham CJ, Xu C, Stout NK, et al. Change in Survival in Metastatic Breast Cancer with Treatment Advances: Meta-Analysis and Systematic Review. *JNCI Cancer Spectr*. 2018;2(4):pky062. Doi: 10.1093/jncics/pky062
43. Gallagher DJ, Kemeny N. Metastatic colorectal cancer: from improved survival to potential cure. *Oncology*. 2010;78(3-4):237-48. Doi: 10.1159/000315730
44. Jonker D, Maroun J, & Kocha W. Survival benefit of chemotherapy in metastatic colorectal cancer: a meta-analysis of randomized controlled trials. *Br J Cancer Manag Res*. 2000;82:1789-94
45. Cancer Treatment & Survivorship Facts & Figures 2019-2021. Atlanta: American Cancer Society; 2019.
46. Xie YH, Chen YX, Fang JY. Comprehensive review of targeted therapy for colorectal cancer. *Signal Transduct Target Ther*. 2020;5(1):22. Doi: 10.1038/s41392-020-0116-z
47. Wangnamthip S, Panchoowong S, Donado C, Lobo K, Phankhongsap P, Sriveerachai P, et al.

- The Effectiveness of Cancer Pain Management in a Tertiary Hospital Outpatient Pain Clinic in Thailand: A Prospective Observational Study. *Pain Res Manag.* 2021;2021:5599023. Doi: 10.1155/2021/5599023
48. Tran G, Zafar SY. Financial toxicity and implications for cancer care in the era of molecular and immune therapies. *Ann Transl Med.* 2018;6(9):166. Doi: 10.21037/atm.2018.03.28
49. Valle I, Tramalloni D, Bragazzi NL. Cancer prevention: state of the art and future prospects. *J Prev Med Hyg.* 2015;56(1):E21-7.