

# HIV Screening among Patients with Newly Diagnosed Solid and Hematologic Malignancies in a Tertiary Hospital in the Philippines

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## ABSTRACT

**Objectives.** This preliminary study determined the prevalence of HIV infection among patients with newly diagnosed solid and hematologic malignancies at the Philippine General Hospital - Cancer Institute.

**Methods.** Adult Filipinos aged 19 years and above with biopsy- or imaging-confirmed malignancy and for chemotherapy, seen at the adult medical oncology and hematology clinic from January to September 2021 were included. Demographic and clinical data were obtained using a questionnaire. Rapid HIV screening was performed using blood extracted via finger prick. Pre- and post-test counselling were conducted.

**Results.** Of the 124 patients included in our study, majority were female (91, 73.4%), and 45 years old and above with a median age of 49 (20 – 74). Majority had solid tumors (121, 97.6%) with breast cancer being the most common (67, 54.0%) followed by colorectal (18, 14.5%), and head and neck cancer (14, 11.3%). Among those with hematologic malignancies, two had acute myelogenous leukemia and one had multiple myeloma. Six patients had AIDS-defining malignancies (NHL, cervical cancer). HIV risk factors and associated conditions were present in 18 patients (14.5%). Ten patients reported prior HIV testing. None of the patients tested positive for HIV.



1<sup>st</sup> Place (Descriptive Category), Moderated Poster Research Contest, 25<sup>th</sup> PCP Midyear Convention, Subic Bay, November 18 – 19, 2022.

Finalist, 2022 Most Outstanding Philippine College of Physician (PCP) Research, Descriptive Category, 52<sup>nd</sup> PCP Annual Convention (Virtual), May 1 – 4, 2022.

E-Poster presentation, 15<sup>th</sup> Annual Meeting of the Korean Society of Medical Oncology and 2022 International Conference (KSMO 2022), Seoul, Korea, Sept 1 – 2, 2022.

eISSN 2094-9278 (Online)  
Published: March 22, 2024  
<https://doi.org/10.47895/amp.vi0.6910>

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**Conclusion.** The absence of HIV cases detected in our cohort may be due to the low prevalence of HIV risk factors and associated conditions. At this time, there is insufficient evidence to routinely recommend HIV testing among newly-diagnosed cancer patients. However, physicians are encouraged to offer HIV testing to cancer patients, especially to those with HIV risk factors, given the benefits of early detection and management of HIV.

**Keywords:** HIV, cancer, screening, Philippines

## INTRODUCTION

The Philippines has the fastest growing number of Human Immunodeficiency Virus /Acquired Immuno-deficiency Syndrome (HIV/AIDS) cases around the world with an average of 28 new cases reported each day in 2022. In January 2022 alone, 875 people were diagnosed with HIV and were added to the HIV/AIDS and ART Registry of the Philippines (eHARP).<sup>1</sup>

Marked improvement in overall survival and life expectancy among Persons Living with HIV (PLHIVs) has been observed over the years due to the availability of highly active antiretroviral therapies (HAART). Then again, their risk for AIDS-defining cancers (aggressive B-cell non-Hodgkin lymphoma, invasive cervical cancer, and Kaposi sarcoma) and non-AIDS defining cancers (NADCs), including Hodgkin lymphoma (HL), lung cancer, head and neck cancers, testicular cancer, and melanoma, exceeds that of the general population.<sup>2-4</sup> PLHIVs with malignancies were reported to have worse outcomes compared to the general population with the same cancer.<sup>2,5</sup>

The presence of HIV infection can complicate cancer management. HIV-related immunosuppression can increase the morbidity and mortality associated with radiation therapy, surgery, cytotoxic therapy, and immunotherapy which are paramount in oncologic care.<sup>6</sup> Concurrent administration of cytotoxic chemotherapy and radiotherapy can also aggravate the immunosuppression among PLHIVs, thereby increasing the risk for opportunistic infections and development of certain AIDS-defining malignancies. Serious drug-drug interaction may also occur between antiretroviral drugs and cancer chemotherapy.<sup>7,8</sup> Knowledge of HIV status can, therefore, help healthcare providers in planning the care and treatment of cancer patients.

The Centers for Disease Control and Prevention (CDC) currently recommends opt-out HIV screening, wherein patients in all healthcare settings are routinely notified and tested for HIV unless the individual declines.<sup>9</sup> This was recommended since risk-based screening may fail to identify patients with HIV especially those <20 years of age, members of the minority, heterosexual men, and women who are unaware of their HIV risk. It is also a cost-effective method to promote early diagnosis and treatment, and decrease risk of HIV transmission.<sup>9</sup> In the Philippines, HIV testing is not routinely offered in all healthcare facilities. The test is usually offered to individuals with HIV risk and requires healthcare providers to obtain an informed consent specifically for HIV testing.

According to the National Comprehensive Cancer Network (NCCN), a not-for-profit alliance of leading cancer centers in the US, HIV testing should be considered in patients with a new cancer diagnosis who have not been recently screened.<sup>10</sup> Testing is particularly important in the context of suspected or confirmed Kaposi sarcoma or primary central nervous system (CNS) lymphoma, given the higher risk of these cancers in PLHIVs compared with the HIV-seronegative population.<sup>11,12</sup> In the Philippines, there are no local guidelines for HIV screening of cancer patients. HIV testing is not yet part of standard care and is not routinely offered among newly diagnosed cancer patients.

Data on the incidence and prevalence of HIV among cancer patients in the Philippines is scarce. There are only two local studies available on HIV screening among cervical cancer patients; both studies found no HIV co-infection

among those diagnosed with cervical cancer.<sup>13,14</sup> Thus, this study aimed to determine the socio-demographic and clinical characteristics, and the prevalence of HIV infection among patients with newly diagnosed solid and hematologic malignancies at the Philippine General Hospital - Cancer Institute.

## MATERIALS AND METHODS

### Study Design

This is a descriptive, cross-sectional study among patients with newly diagnosed solid and hematologic malignancies seen at the outpatient clinic of the Philippine General Hospital - Cancer Institute.

### Study Area

The Philippine General Hospital - Cancer Institute is the country's national university hospital and national referral center for cancer care. It is a highly specialized non-emergency center which houses the multidisciplinary facilities for cancer patients. Pre-pandemic, the adult medical oncology sees around 30 new patients and 150 - 200 patients for follow-up and outpatient chemotherapy daily. On the other hand, the adult hematology clinic sees as much as 80 patients per week.

Inpatient and outpatient HIV services are offered in PGH through the STD, AIDS Guidance Intervention and Prevention (SAGIP) Unit. It is one of the DOH-designated HIV treatment hubs in the Philippines.

### Sampling Design

Convenience sampling was done. Sample size was calculated based on a prevalence of 1.2%.<sup>15</sup> The minimum sample size computed was 240.

### Study Population, Inclusion and Exclusion Criteria

Adult Filipino patients aged 19 years and above with biopsy- or imaging-confirmed malignancy seen in the adult medical oncology and hematology clinic from January to September 2021 were recruited. Only patients who will be receiving chemotherapy for the first time, regardless of route of administration, were included in the study. Known HIV-positive patients were excluded. Those with other solid or hematologic malignancies not referred to the Adult Oncology and Hematology Clinic were also excluded. Patients who did not consent to chemotherapy or those deemed ineligible for chemotherapy by the medical oncologist and hematologist due to the terminal nature of the disease, coexisting medical condition or poor performance status were also excluded. Informed consent was obtained before study enrolment and HIV testing.

### Data Collection

We used a standard questionnaire to obtain demographic and clinical data. SD Bioline HIV 1-2 3.0 (Standard

Diagnostics, Abbott Laboratories, USA) (Sensitivity 99.8%; Specificity 100.0%)<sup>16</sup> was used for HIV screening. Following standard aseptic technique, whole blood was extracted via finger prick with a lancet on the pad of the patient's 2nd digit of the non-dominant hand. Lancet was discarded in a biohazard box immediately after use. Using a disposable capillary pipette, around 20 uL of fresh blood was collected and transferred to the specimen well. Four drops or 120 uL of assay diluent was added to the specimen well. The pipette was discarded in the biohazard box after use. Results were read 15 minutes after addition of the diluent. A positive result was indicated by the presence of bands on the control line and either of the HIV-1 or HIV-2 line. A negative result was indicated by a lone band on the control line, while an invalid test is indicated by the absence of a band on the control line. Pre- and post-test counseling was done for all patients.

### Statistical Analysis

Sociodemographic and clinical information were collected on a standard data collection form, computerized, encoded, and analyzed using Microsoft Excel. Continuous data were presented as median  $\pm$  SD and categorical data as percentages. HIV positivity rate was expressed as a proportion.

### Ethical Considerations

This study was approved by the University of the Philippines Manila Research Ethics Board (UPMREB CODE 2020-539-01). Adult patients who satisfied the inclusion criteria were recruited by members of the study group. An informed consent (in English and Filipino) for participation in the study was administered. Patients who did not consent were excluded.

## RESULTS

Of the 124 patients included in our study, majority were female (91, 73.4%) and more than 45 years old (61.3%), with a median age of 49 (20 – 74). Co-existing conditions were also present with hypertension being the most common (25, 20.2%). Majority had solid tumors (121, 97.6%) while only three (2.4%) had hematologic malignancies. Breast cancer was the most common (67, 54.0%) followed by colorectal (18, 14.5%), head and neck (14, 11.3%), and NHL (5, 4.0%) (Table 1). Among those with hematologic malignancies, two had acute myeloid leukemia and one had multiple myeloma.

HIV risk factors and associated conditions were present in 18 patients (14.5%) as shown in Table 2. Six patients had AIDS-defining malignancies. In terms of social and sexual behaviors, majority of the patients were heterosexual (118, 95.2%). Four patients were bisexual, two were homosexual, and two were men having sex with men (MSM). For the MSMs, both were engaged in anal insertive and receptive sex with no condom use. None of our patients were transgender or were involved in sex work. Three patients had a previous

**Table 1.** Clinical Profile of Newly Diagnosed Cancer Patients who Underwent HIV Testing

	No.	%
<b>Age (in years)</b>		
<b>Median <math>\pm</math> SD (Range)</b>	49 $\pm$ 11.7	(20 – 74)
19 - 25	4	3.2
26 - 35	18	14.5
36 - 45	26	21.0
46 - 55	42	33.9
56 - 65	28	22.6
> 65	6	4.8
<b>Assigned sex at birth</b>		
Male	33	26.6
Female	91	73.4
<b>Marital status</b>		
Married	75	60.5
Single	35	28.2
Widowed	9	7.3
Common-law partner	5	4.0
<b>Co-existing conditions</b>		
Hypertension	41	33.1
T2DM	25	20.2
BA	10	8.1
CKD	2	1.6
Depression	1	0.8
Schizophrenia	1	0.8
CAD	1	0.8
<b>Solid malignancy</b>		
Breast	121	97.6
Colorectal	67	54.0
Head and neck*	18	14.5
Non-Hodgkin lymphoma	14	11.3
Hodgkin lymphoma	5	4.0
Lung	4	3.2
Melanoma	3	2.4
Pancreatic	2	1.6
Testicular	2	1.6
Endometrial	1	0.8
Cervical	1	0.8
Gallbladder	1	0.8
Gastric	1	0.8
GIST	1	0.8
<b>Hematologic malignancy</b>		
AML	3	2.4
MM	2	1.6
	1	0.8

Abbreviations: T2DM (Type 2 Diabetes Mellitus), BA (Bronchial asthma), CKD (Chronic Kidney Disease), CAD (Coronary Artery Disease), GIST (Gastrointestinal Stromal Tumor), AML (Acute Myeloid Leukemia), MM (Multiple Myeloma)

\*Including nasopharyngeal cancer, cancer of the salivary glands, and squamous cell carcinoma of the eyelids

**Table 2.** HIV Risk Factors and HIV-associated Conditions

	No.	%
<b>Presence of risk factors</b>		
Single risk factor	17	13.7
Multiple risk factors	1	0.8
<b>Coexisting conditions</b>		
Previous/active TB	3	2.4
History of other STIs	3	2.4
Chronic Hepatitis B	1	0.8
<b>AIDS-defining malignancies</b>		
Non-Hodgkin lymphoma	5	4.0
Cervical	1	0.8
<b>Social factor</b>		
History of illicit drug use	5	4.0
<b>Sexual practices</b>		
Bisexual	4	3.2
Homosexual	2	1.6
MSM	2	1.6

Abbreviations: TB (Tuberculosis), STIs (Sexually Transmitted Infections), MSM (Men having Sex with Men)

history of sexually transmitted infections (STIs). Only 10 patients (8.1%) reported prior HIV testing.

None of the patients screened were positive for HIV.

## DISCUSSION

Among the 124 cancer patients screened in our study, none tested positive for HIV. Similar studies done in the Philippines among cervical cancer patients yielded similar results; however, these studies were also limited by small sample sizes.<sup>13,14</sup> We also observed a lower prevalence compared to a cohort of adult cancer patients from the United States (1.2%).<sup>15</sup>

Based on the Department of Health HIV/AIDS and ART Registry of the Philippines (eHARP), HIV prevalence in the Philippines remains low despite the rapid increase in the number of new cases diagnosed per year.<sup>1</sup> Certain populations including MSMs, people who inject drugs (PWIDs), sex workers, and transgender people remain at risk and vulnerable.<sup>17</sup> Only 14.5% of our patients had identifiable HIV risk factors and associated conditions namely tuberculosis, hepatitis B, prior STIs, AIDS-defining malignancies, illicit drug use, and high-risk sexual behaviors. Both MSMs in our population were engaged in anal receptive and insertive intercourse with no condom use. This low number of patients with HIV risk factors and the low prevalence of HIV in the country may contribute to the absence of HIV cases observed in our study.

Although our study was not able to identify patients with concurrent HIV, we cannot discount the role of early screening especially among vulnerable populations including cancer patients. Currently, the Philippine Society of Medical Oncology (PSMO) has no recommendations regarding

HIV screening among cancer patients prior to initiation of chemotherapy. This may be due to the paucity of local data on the prevalence of HIV among cancer patients, and physician screening practices or behaviors.<sup>13,14</sup>

Early screening and detection of HIV infection among cancer patients allows physicians to manage HIV with ART to preserve immune function and prevent further immunosuppression. HIV-related immunosuppression can increase the morbidity and mortality associated with radiation therapy, surgery, and cytotoxic therapy and immunotherapy which are paramount in oncologic care.<sup>6</sup> In addition, knowledge of HIV status can help healthcare providers in the proper planning of interventions to improve HIV-related cancer survival. These benefits, on top of the cheap cost of individual rapid screens, could justify its routine use especially among cancer patients.

Our study has several limitations particularly its low sample size and limited generalizability. The required sample size was not reached due to the restrictions experienced in the COVID-19 pandemic. Frequent lockdowns have resulted to a decrease in the number of outpatient consults. Fewer patients sought medical consultation due to fear of contracting COVID-19. At the onset of the pandemic, our institution also became a COVID-19 referral center with brief suspension of operations in the PGH Cancer Institute. Upon resumption, operations were scaled down to comply with infection control guidelines.<sup>18</sup> Few adult patients with hematologic malignancies were also screened due to the limited number of patients and clinic days allotted for adult hematology patients. Majority also received chemotherapy prior to outpatient consult, hence, were immediately excluded in the study. We were also unable to catch a number of patients with cervical cancer since these patients were seen in a different clinic in the cancer institute. Follow-up study is recommended to include: 1) all cancer patients, whether eligible for chemotherapy or not; 2) admitted patients and; 3) patients outside the adult medical oncology and hematology clinics.

The study did not compute for HIV testing rate and did not document the reasons for not consenting to study participation and HIV testing. Thus, we recommend that larger, multi-center studies be conducted to ascertain whether routine HIV screening among patients with newly diagnosed cancer is needed.

## CONCLUSIONS

HIV positivity is 0% among the 124 patients tested. The presence of HIV risk factors and associated conditions among the patients in the cohort is low at 14.5%. At this time, there is insufficient evidence to routinely recommend HIV testing among newly diagnosed cancer patients. Nonetheless, physicians are encouraged to offer HIV screening to patients given the benefits of early diagnosis and management of HIV.

## Statement of Authorship

JPB, ARMV, MJLM and AFGM contributed in the conceptualization of work, acquisition and analysis of data, drafting and revising of manuscript, and final approval of the version to be published. JACL contributed in the conceptualization of work, acquisition of data, drafting and revising of manuscript, and final approval of the version to be published. ARAI contributed in the acquisition of data, drafting and revising of manuscript, and final approval of the version to be published. MDSJ contributed in the conceptualization of work, drafting and revising of manuscript, and final approval of the version to be published.

## Author Disclosure

All authors declared no conflicts of interest.

## Funding Source

The study is funded by the authors.

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