CANCER REGISTRY & SEARCH PHILIPPINES

2021 CARE PH ANNUAL REPORT

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Every preventable cancer averted.
Every screenable cancer detected.
Every cancer patient counted.

Illustration: Jason Confesor

Dear **CARERS**:

The year 2021 came and went in the blink of an eye—and so will 2022. As we end the 1st quarter of this year, allow me to share with you highlights of last year for CARE PH.

An area of growth for our organization was epidemiologic research activities. Our studies on the diagnosis and treatment of blood malignancies (BLOOM PH Study), prostate and other urologic malignancies (PUMA Study), bone and soft tissue sarcomas in children and adults (BEST Study), and liver cancer (CANDLE Study) were all granted approval or continuing approval by the Single Joint Research Ethics Board (SJREB) or the Institutional Review Boards (IRB) of individual CARE PH hospital sites for these studies. Amendments were made to accommodate the limitations imposed by the pandemic, like lockdowns and quarantines, and these allowed us to continue recruitment and follow-up activities via the conduct of virtual informed consent process and tele consults.

Another milestone was the approval from the SJREB and IRBs to waive the need for individual consent forms for BLOOM PH, PUMA and BEST Studies as these are retrospective studies and are de-identified before the data is analyzed. At the end of these studies, there will be a database (site-specific registries) which can already be turned over to the collaborating specialty oncology societies for them to archive or to maintain and curate.

Hospital cancer registration, as mandated by NICCA 2019, continued in 2021. The pandemic made recruitment of new hospitals more challenging as setting up of a hospital cancer registry means new and additional work for the hospital IT department and for the oncology department and staff, and also needs funding for salaries of new personnel (or more work for same pay)—none of which make a conducive atmosphere for setting up a new Tumor Registry Office in the hospital.

Nonetheless, we were able to recruit 4 new hospitals in 2021. These were 1. Calamba Med Center 2. Antique Med Center 3. Mary Mediatrix Med Center and 4. AMOSUP Seamen's Hospital. For this year, our target is to add 17 more hospitals, so we will hopefully have 50 hospitals at 5 years old. We call this project 50@5.

A total of 25 hospitals (compared to 18 in 2020) contributed to the summary data seen in this annual report. The 5 hospitals with highest number of registrants are 1. Philippine General Hospital, TMC Pasig, Chinese General Hospital, Dagupan Doctors Villaflor Memorial Hospital, and Makati Medical Center. Together, these 5 hospitals contributed 57% of the 12,836 new registrants for 2021. The top 5 cancer sites are breast, colorectal, cervical, head and neck and uterine. Note that 3 of these 5 are cancers in women.

In our 3rd General Assembly held in November 2020, we elected 2 new members to the Board of Trustees. Aileen Hidalgo of Zamboanga del Sur MC and Manuel Francisco Roxas of the Philippine College of Surgeons Cancer Commission. They are serving their 1st of 3 years in the BOT. Welcome aboard, Aileen and Ramy!

Slowly but surely the implementation of NICCA is taking place, guided by the 10-year strategic plan of the DOH cancer control program, supervised by the Cancer Control Council. CARE PH is playing a small but relevant role in this cancer healthcare ecosystem, and I hope we can all continue to play our role well as we all move ***towards better healthcare of the Filipino cancer patient.***

Yours in the service of the Filipino cancer patient,

Trixie

15 March 2022

CEO's Corner & Executive Summary

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List of Abbreviations

PGH	Philippine General Hospital
TMC	The Medical City
CGH	Chinese General Hospital
DDVMH	Dagupan Doctors Villaflor Memorial Hospital
MMC	Makati Medical Center
NKTI	National Kidney and Transplant Institute
CSMC	Cardinal Santos Medical Center
BiMC	Bicol Medical Center
BatMC	Batangas Medical Center
NMMC	Northern Mindanao Medical Center
BOH	Beginning on Hand
EOH	Ending on Hand

CANCER IN THE PHILIPPINES: Burden of Disease

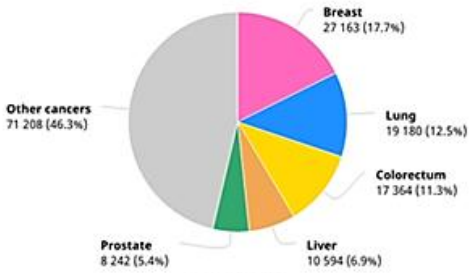
GLOBOCAN 2020

In December 2020, CANCER TODAY website was updated with GLOBOCAN 2020 database version 2.0. In it we find data sourced from the Cebu Cancer Registry, Manila Cancer Registry and Rizal Cancer Registry weighted/sample average of the most recent local rates, applied to the 2020 population of 109,581,085 Filipinos [1]. In that same update, the estimated number of new cases of cancer for 2020 was 153,751, or a nine percent increase from 2018 new cases of 141,021; while the number of cancer deaths for the same period showed a seven percent increase to 92,6060 from 86,337 in 2018.

The top ten **incident** cancers in the Philippines, based on the 2020 GLOBOCAN data presented in Figure 1 are: Breast Cancer, Lung Cancer, Colon Cancer, Liver Cancer, Prostate Cancer, Cervical Cancer, Thyroid Cancer, Rectal Cancer, Leukemia, and Ovarian Cancer.

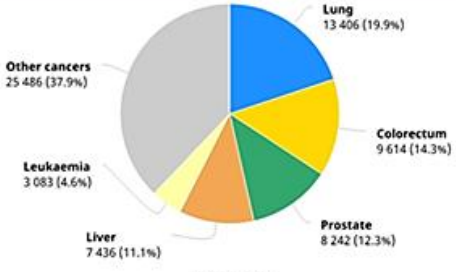
The top ten most common cause of cancer **death** in the Philippines, based on the 2020 GLOBOCAN data presented in Figure 1 are: Lung Cancer, Liver Cancer, Breast Cancer, Colon Cancer, Leukemia, Cervical Cancer, Ovarian Cancer, Pancreatic Cancer, Prostate Cancer, and Rectal Cancer.

Number of new cases in 2020, both sexes, all ages



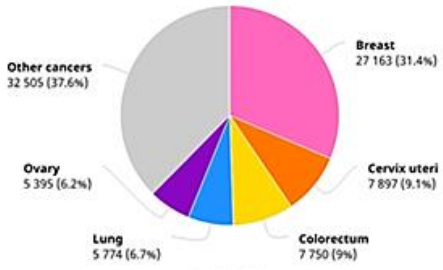
Total: 153 751

Number of new cases in 2020, males, all ages



Total: 67 267

Number of new cases in 2020, females, all ages



Total: 86 484

Summary statistic 2020

	Males	Females	Both sexes
Population	55 028 825	54 552 260	109 581 085
Number of new cancer cases	67 267	86 484	153 751
Age-standardized incidence rate (World)	164.6	167.3	162.0
Risk of developing cancer before the age of 75 years (%)	16.7	16.7	16.5
Number of cancer deaths	47 046	45 560	92 606
Age-standardized mortality rate (World)	119.5	88.2	100.0
Risk of dying from cancer before the age of 75 years (%)	11.7	9.0	10.2
5-year prevalent cases	134 739	219 659	354 398
Top 5 most frequent cancers excluding non-melanoma skin cancer (ranked by cases)	Lung Colorectum Prostate Liver Leukaemia	Breast Cervix uteri Colorectum Lung Ovary	Breast Lung Colorectum Liver Prostate

Geography

Numbers at a glance

Total population

109 581 085

Number of new cases

153 751

Number of deaths

92 606

Number of prevalent cases (5-year)

354 398

Data source and methods

Incidence

Country-specific data source: Cebu Cancer Registry, Manilla Cancer Registry, Rizal Cancer Registry
Method: Weighted/simple average of the most recent local rates applied to 2020 population

Mortality

Country-specific data source: National (WHO)
Method: Estimated from national incidence estimates by modelling, using incidence:mortality ratios derived from cancer registry data in neighbouring countries

Prevalence

Computed using sex-; site- and age-specific incidence to 1-;3- and 5-year prevalence ratios from Nordic countries for the period (2006-2015), and scaled using Human Development Index (HDI) ratios.

Philippines

Source: Globocan

Incidence, Mortality and Prevalence by cancer site

	New cases				Deaths				5-year prevalence (all ages)	
Cancer	**Number**	**Rank**	**(%)**	**Cum.risk**	**Number**	**Rank**	**(%)**	**Cum.risk**	**Number**	**Prop. (per 100 000)**
Breast	27 163	1	17.7	5.66	9 926	3	10.7	2.02	85 206	156.19
Lung	19 180	2	12.5	2.56	17 063	1	18.4	2.30	20 625	18.82
Colon	11 315	3	7.4	1.39	6 109	4	6.6	0.65	25 916	23.65
Liver	10 594	4	6.9	1.30	9 953	2	10.7	1.23	10 964	10.01
Prostate	8 242	5	5.4	2.30	3 164	9	3.4	0.41	26 942	48.96
Cervix uteri	7 897	6	5.1	1.61	4 052	6	4.4	0.88	19 933	36.54
Thyroid	6 345	7	4.1	0.65	743	21	0.80	0.08	19 260	17.58
Rectum	5 846	8	3.8	0.75	2 982	10	3.2	0.36	14 577	13.30
Leukaemia	5 795	9	3.8	0.47	4 370	5	4.7	0.38	16 835	15.36
Ovary	5 395	10	3.5	1.13	3 379	7	3.6	0.77	13 667	25.05
Corpus uteri	4 374	11	2.8	1.01	1 306	15	1.4	0.31	12 417	22.76
Non-Hodgkin lymphoma	4 140	12	2.7	0.46	2 415	12	2.6	0.27	11 065	10.10
Stomach	3 381	13	2.2	0.40	2 860	11	3.1	0.32	4 531	4.13
Pancreas	3 349	14	2.2	0.40	3 283	8	3.5	0.40	2 804	2.56
Nasopharynx	3 006	15	2.0	0.33	1 947	13	2.1	0.24	8 370	7.64
Kidney	2 384	16	1.6	0.29	1 229	16	1.3	0.14	5 785	5.28
Brain, central nervous system	2 037	17	1.3	0.19	1 752	14	1.9	0.18	5 311	4.85
Bladder	1 714	18	1.1	0.21	996	19	1.1	0.09	4 391	4.01
Lip, oral cavity	1 561	19	1.0	0.19	870	20	0.94	0.10	3 902	3.56
Larynx	1 550	20	1.0	0.21	1 020	18	1.1	0.13	4 124	3.76
Oesophagus	1 144	21	0.74	0.14	1 122	17	1.2	0.14	1 228	1.12
Multiple myeloma	766	22	0.50	0.10	649	22	0.70	0.09	1 754	1.60
Salivary glands	578	23	0.38	0.07	244	25	0.26	0.03	1 641	1.50
Hodgkin lymphoma	514	24	0.33	0.04	152	27	0.16	0.02	1 632	1.49
Oropharynx	465	25	0.30	0.06	272	23	0.29	0.03	1 106	1.01
Melanoma of skin	418	26	0.27	0.05	251	24	0.27	0.03	1 131	1.03
Testis	358	27	0.23	0.06	74	30	0.08	0.01	1 157	2.10
Gallbladder	286	28	0.19	0.03	215	26	0.23	0.03	355	0.32
Anus	203	29	0.13	0.03	92	29	0.10	0.01	495	0.45
Hypopharynx	184	30	0.12	0.03	107	28	0.12	0.02	284	0.26
Vulva	158	31	0.10	0.04	61	31	0.07	0.01	423	0.78
Penis	126	32	0.08	0.03	45	34	0.05	0.01	345	0.63
Vagina	97	33	0.06	0.02	49	33	0.05	0.01	249	0.46
Mesothelioma	63	34	0.04	0.01	57	32	0.06	0.01	69	0.06
Kaposi sarcoma	11	35	0.01	0.00	5	35	0.01	0.00	31	0.03
All cancer sites	153 751	-	-	16.50	92 606	-	-	10.22	354 398	323.4

Figure 1. GLOBOCAN 2020 estimates of incidence and mortality in the Philippines.

CARE PH HOSPITAL-BASED CANCER REGISTRY

2021 Consolidated Cancer Census

Twenty-five (25) member hospitals have completed sharing their data as of 17 March 2022, for a total of 12,839 new registrants last 2021. Breakdown of primary cancer sites are shown in Figure 2.

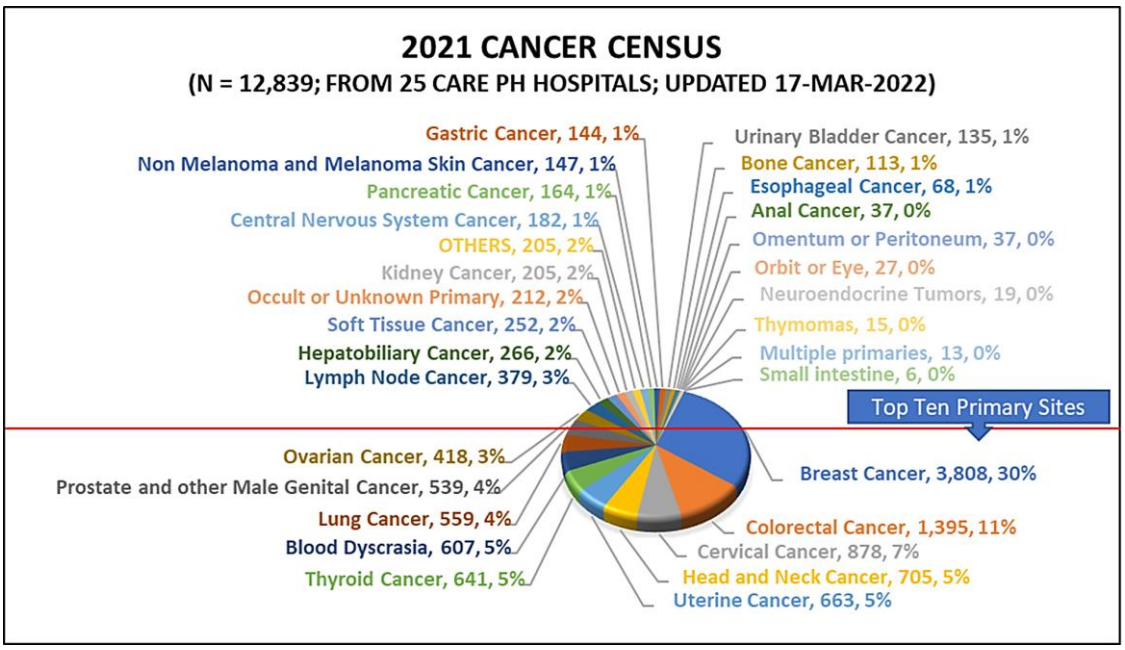


Figure 2. Frequency of primary cancer sites in CARE PH cancer census 2021.

The top ten most frequently diagnosed cancers in the CARE PH Registry System are: Breast Cancer, Colorectal Cancer, Cervical Cancer, Head and Neck Cancer, Uterine Cancer, Thyroid Cancer, Blood Malignancies, Lung Cancer, Prostate and other Male Urogenital Cancers, Ovarian Cancer.

GLOBOCAN incidence and mortality data separates colon cancer from rectal cancer (although their pie chart unites these two cancer sites). Nasopharyngeal, Lip and Oral Cavity, and Laryngeal Cancers are also separated in the GLOBOCAN incidence and mortality reports.

When we separate the Colorectal and Head and Neck Cancers into sub-categories similar to that of the population-based cancer registry GLOBOCAN, we see that among the colorectal cancers **with ICD classification** entered into the 2021 CARE PH registry (N = 1,198) colon cancers (n = 759) outnumber rectal cancers (n = 439), as seen in Table 1. This ratio is consistent with GLOBOCAN data. We continue to encourage all tumor registrars to enter ICD classification of all entries more consistently and completely, for a more accurate picture of the breakdown of all cancers.

Primary Site: Colorectal Cancer		
ICD 10	**No. of Registrants**	**Subtotal**
RECTAL CANCER		**439**
C20 Malignant neoplasm of rectum	439	
COLON CANCER		**759**
(C18.7) Sigmoid colon	249	
C18 Malignant neoplasm of colon	187	
C19 Malignant neoplasm of rectosigmoid junction	75	
(C18.2) Ascending colon	66	
(C18.9) Colon, unspecified	57	
(C18.6) Descending colon	43	
(C18.4) Transverse colon	39	
(C18.0) Caecum	20	
(C18.8) Overlapping lesion of colon	11	
(C18.1) Appendix	6	
(C18.3) Hepatic flexure	3	
(C18.5) Splenic flexure	3	
NO ICD CLASSIFICATION INDICATED	**197**	**197**
TOTAL		**1,395**

Table 1. New cases of colon and rectal cancers in CARE PH central database.

GLOBOCAN separate head and neck cancers into sub-categories nasopharyngeal cancer, lip and oral cavity cancers and laryngeal cancers. If we do the same for CARE PH head and neck data, we see that nasopharyngeal cancers make up majority of all head and neck cancers in the country. Among the head and neck cancers **with ICD classification** entered into the registry (N = 634) nasopharyngeal cancers (n = 239) outnumber laryngeal cancers (n = 81), and lip and oral cancers (n = 58) as seen in Table 2. This data is different from 2020 GLOBOCAN data on Philippine cancer, where nasopharyngeal cancer (n = 3,006) is double that of lip and oral cancer (n = 1,561), which in turn is slightly **more** than laryngeal cancer (n = 1,550). In the 2021 CARE PH central database, nasopharyngeal cancer (n = 239) is more than 4x more frequent than lip and oral cancers (n = 58), which in turn is **less** than laryngeal cancers (n = 81).

The 2021 CARE PH database and its differences from the 2020 GLOBOCAN population-based cancer registry may help guide cancer researchers in focusing future research efforts. We encourage specialty oncology groups to create site-specific registries to better understand and perhaps identify gaps in cancer care from screening to diagnosis and staging to treatment that could lead to action points for hospital-based or community-based cancer control projects or programs.

Primary Site: Head and Neck Cancer		
ICD 10	**No. of Registrants**	**Subtotal**
NASOPHARYNX		**239**
C11 Malignant neoplasm of nasopharynx	239	
LIP and ORAL		**58**
C02 Malignant neoplasm of other and unspecified parts of tongue	33	
C06 Malignant neoplasm of other and unspecified parts of mouth	26	
C05 Malignant neoplasm of palate	19	
C00 Malignant neoplasm of lip	5	
C04 Malignant neoplasm of floor of mouth	5	
C03 Malignant neoplasm of gum	3	
LARYNGEAL		**81**
C32 Malignant neoplasm of larynx	77	
C13 Malignant neoplasm of hypopharynx	4	
C12 Malignant neoplasm of piriform sinus	0	
ALL ELSE		**223**
C01 Malignant neoplasm of base of tongue	47	
C07 Malignant neoplasm of parotid gland	38	
C10 Malignant neoplasm of oropharynx	33	
C08 Malignant neoplasm of other and unspecified major salivary glands	30	
(C30.0) Nasal cavity	26	
C09 Malignant neoplasm of tonsil	21	
C31 Malignant neoplasm of accessory sinuses	11	
C14 Malignant neoplasm of other and ill-defined sites in the lip, oral cavity and pharynx	7	
(C30.1) Middle ear	6	
C30 Malignant neoplasm of nasal cavity and middle ear	4	
NO ICD CLASSIFICATION INDICATED	71	**71**
TOTAL		**705**

Table 2. New cases of head and neck cancers in CARE PH central database.

The lung cancers registered in the CARE PH hospital-based cancer registry system continue to make up only 4% (n = 559 of N = 12,839) of the 2021 cancer census (rank no. 8), while in the 2020 population-based cancer registry GLOBOCAN database, 12.5% (estimated n = 19,180 of N = 153,751) of the cancer cases in the Philippines in 2020 were lung cancer (rank no. 2). Liver cancer is also in the top ten cancers in the Philippines in GLOBOCAN (rank no. 4), but not in the CARE PH registry (rank no. 12).

CARE PH reminds all CARE PH hospitals to include cytology reports, and not just histopathology reports, as lung cancer is often diagnosed via pleural fluid analysis; and, when possible, to include radiology departments as catchment area since liver cancers are often times diagnosed in the advanced stage via imaging (ultrasound or CT scans or MRI scans) in concordance with AFP levels and/or HepB or HepC positivity and/or cirrhosis. Liver Center physicians are also requested to assist the tumor registrar in identifying patients with Liver Cancer who they have diagnosed using clinical criteria.

No.	Institution	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1	Philippine General Hospital	312	295	279	188	194	317	312	237	187	260	282	341	3,204
2	The Medical City	121	126	155	84	112	143	130	126	104	133	159	102	1,495
3	Chinese General Hospital	89	88	77	46	94	107	100	85	86	108	121	113	1,114
4	Dagupan Doctors Villaflor Memorial Hospital	117	84	79	70	57	63	82	82	77	90	70	65	936
5	Makati Medical Center	81	86	75	70	64	78	79	58	80	111	81	68	931
6	National Kidney & Transplant Institute	94	154	120	49	69	28	31	19	42	78	51	58	793
7	Cardinal Santos Medical Center	58	52	73	65	65	58	88	77	52	63	54	60	765
8	Bicol Medical Center	68	70	85	83	51	71	65	62	36	43	54	39	727
9	Batangas Medical Center	1	4	10	98	58	62	58	38	29	26	63	56	503
10	Northern Mindanao Medical Center	43	39	32	36	37	39	43	35	37	41	26	28	436
11	Rizal Medical Center	22	25	24	6	31	46	47	41	37	27	48	47	401
12	Medical Center Manila	36	24	24	14	24	14	36	30	24	27	38	20	311
13	Cotabato Regional & Medical Center	54	25	52	25	49	35	0	0	0	0	0	0	240
14	East Avenue Medical Center	32	29	48	7	4	17	7	5	1	2	77	11	240
15	Bicol Regional Training and Teaching Hospital	23	7	21	16	15	10	12	22	17	29	22	24	218
16	Davao Doctors Hospital	14	15	11	22	17	17	14	17	12	5	1	1	146
17	The Medical City Clark	7	6	6	6	6	5	7	2	7	1	10	9	72
18	Palawan MMG-PPC	7	6	3	8	1	9	9	13	4	3	2	0	65
19	Zamboanga Del Sur Medical Center	12	4	6	6	0	11	2	6	0	0	2	0	49
20	Bulacan Sacred Heart	7	5	6	6	10	8	2	1	0	0	1	0	46
21	Baguio Medical Center	4	4	2	2	7	3	9	4	2	0	3	2	42
22	TMC Iloilo	3	2	5	3	2	5	3	3	1	7	2	5	41
23	Metro Davao Medical and Research Center	3	4	16	7	1	1	0	0	0	0	0	0	32
24	The Medical City Pangasinan	1	2	7	0	0	0	5	1	0	0	4	1	21
25	St. Paul Hospital of Tuguegarao	1	0	0	0	0	0	0	0	2	1	1	6	11
	TOTAL:	1,210	1,156	1,216	917	968	1,147	1,141	964	837	1,055	1,172	1,056	**12,839**

Table 3. CARE PH monthly summary per institution in 2021.

2021 CARE PH Member Hospitals

The following hospitals have the highest contribution to the total number of new registrants for CARE PH 2021:

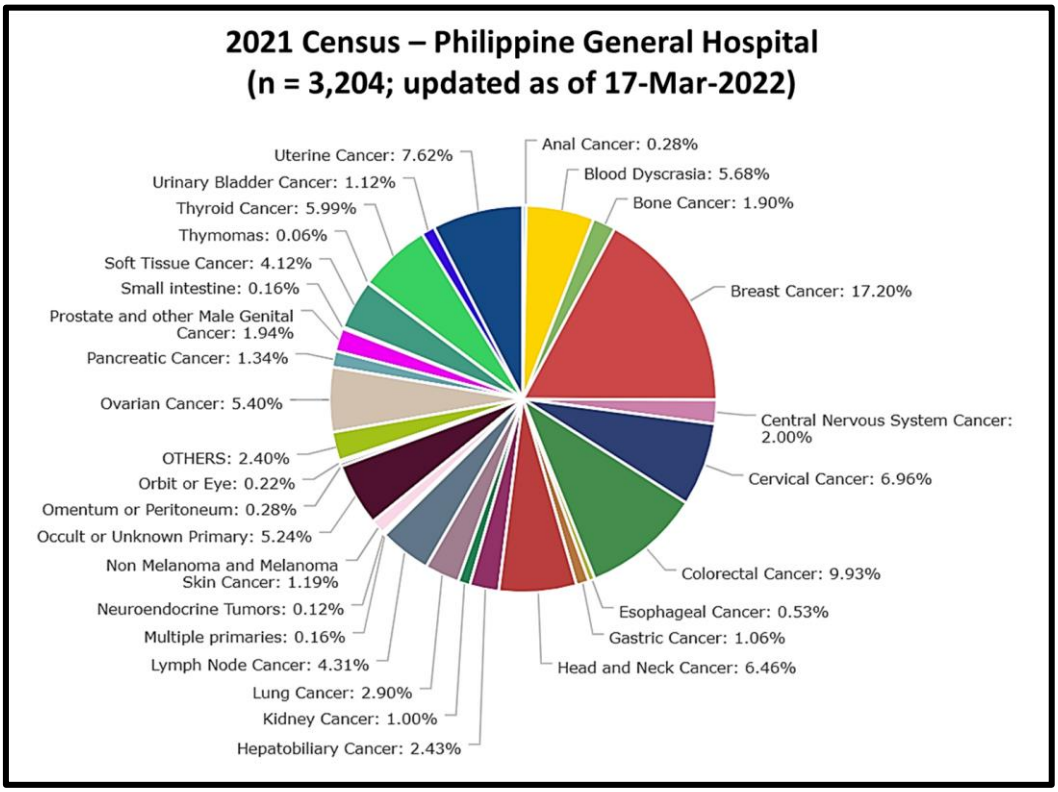


Figure 3. Frequency of primary cancer sites in PGH cancer census 2021.

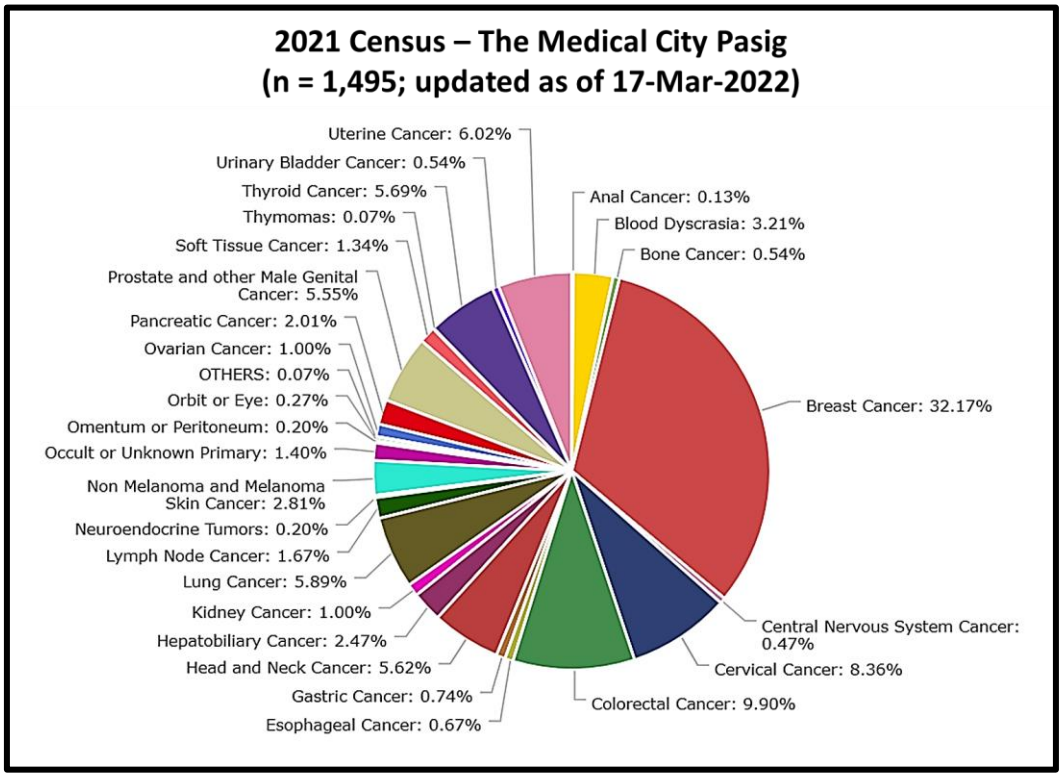


Figure 4. Frequency of primary cancer sites in TMC-Pasig cancer census 2021.

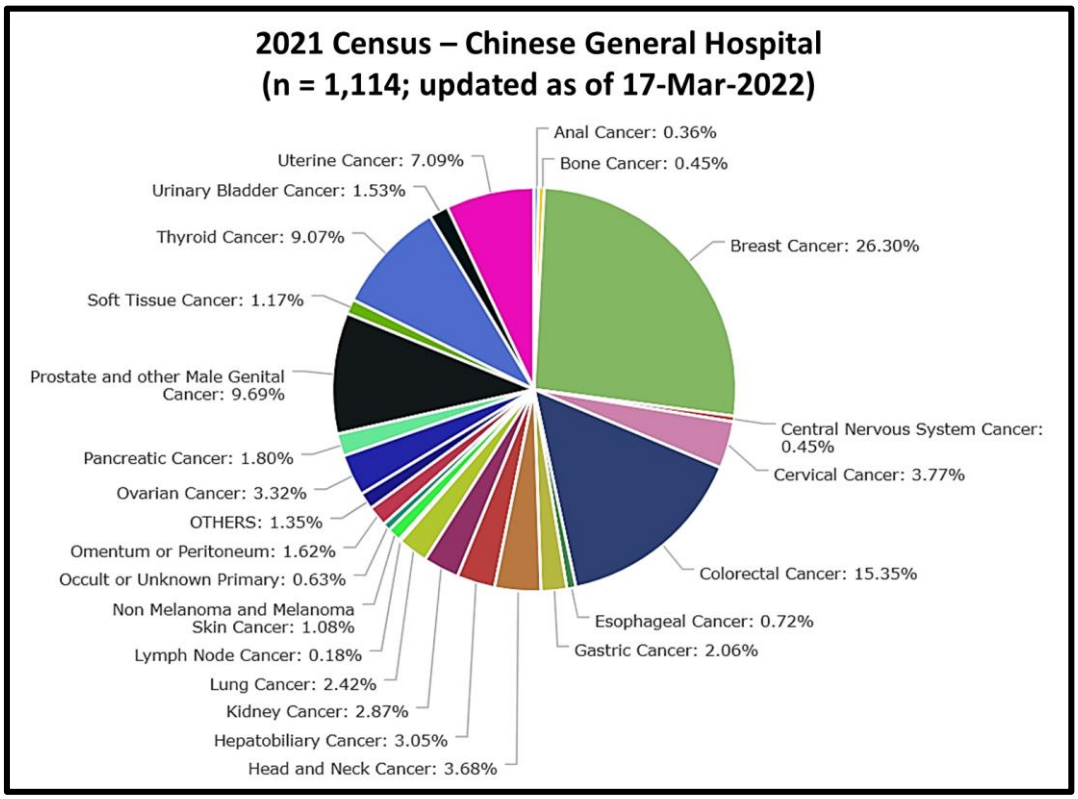


Figure 5. Frequency of primary cancer sites in CGH cancer census 2021.

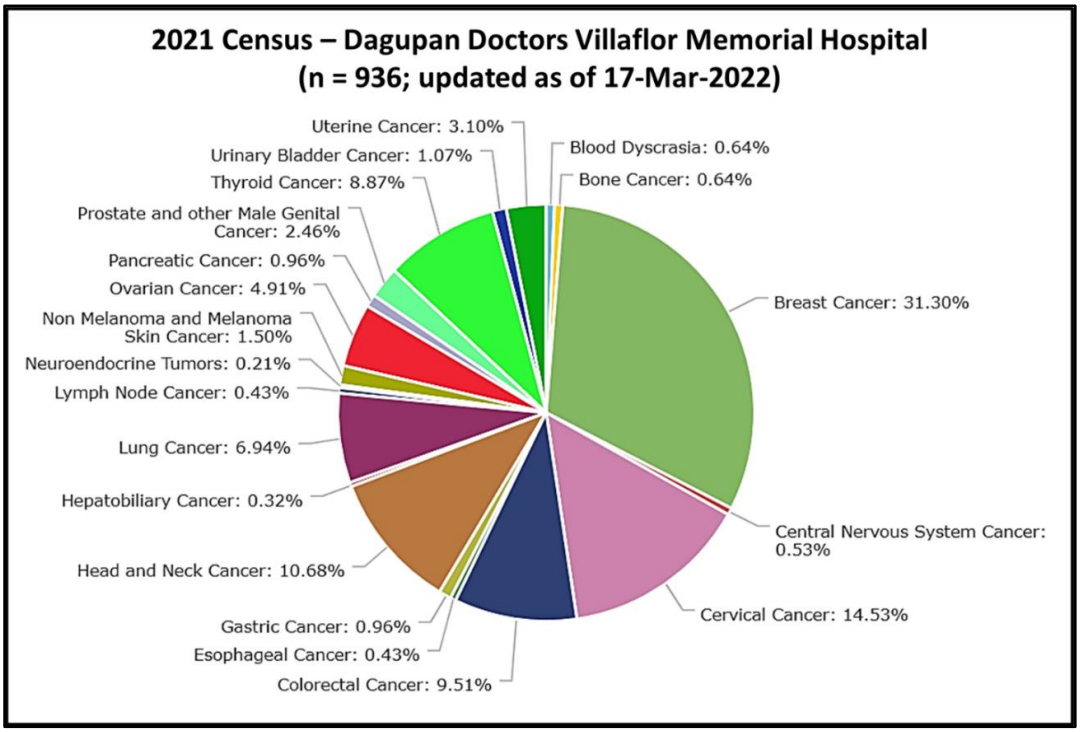


Figure 6. Frequency of primary cancer sites in DDVMH cancer census 2021.

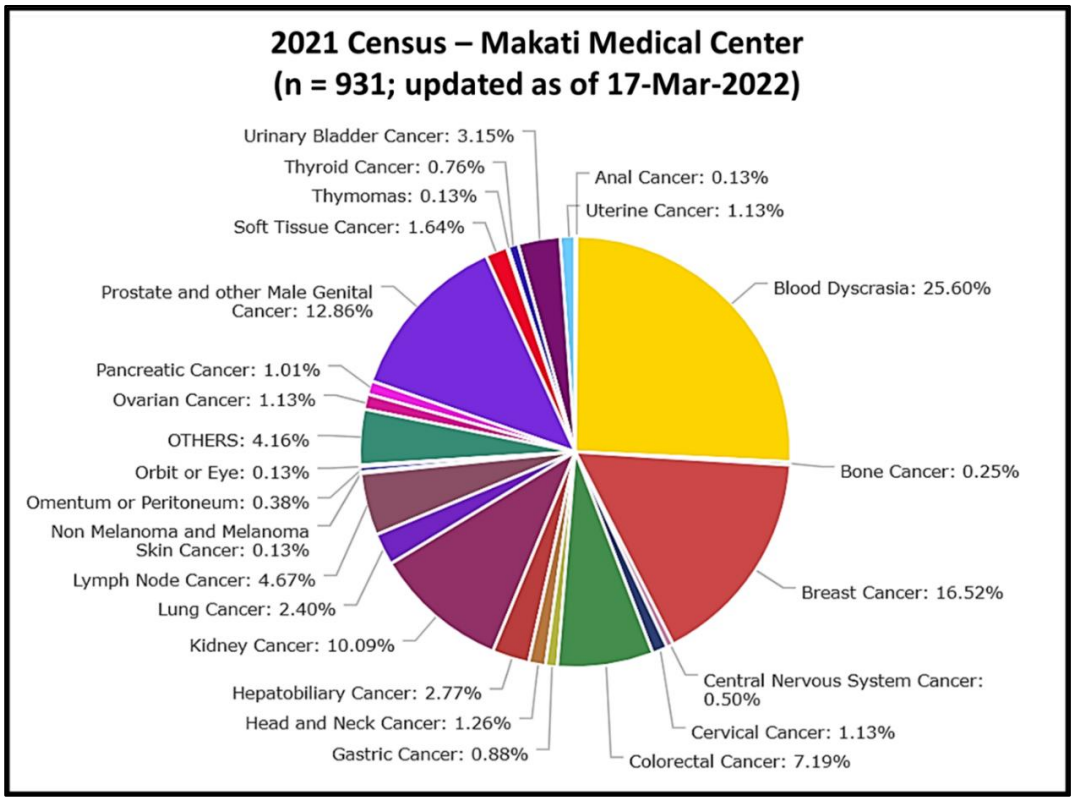


Figure 7. Frequency of primary cancer sites in MMC cancer census 2021.

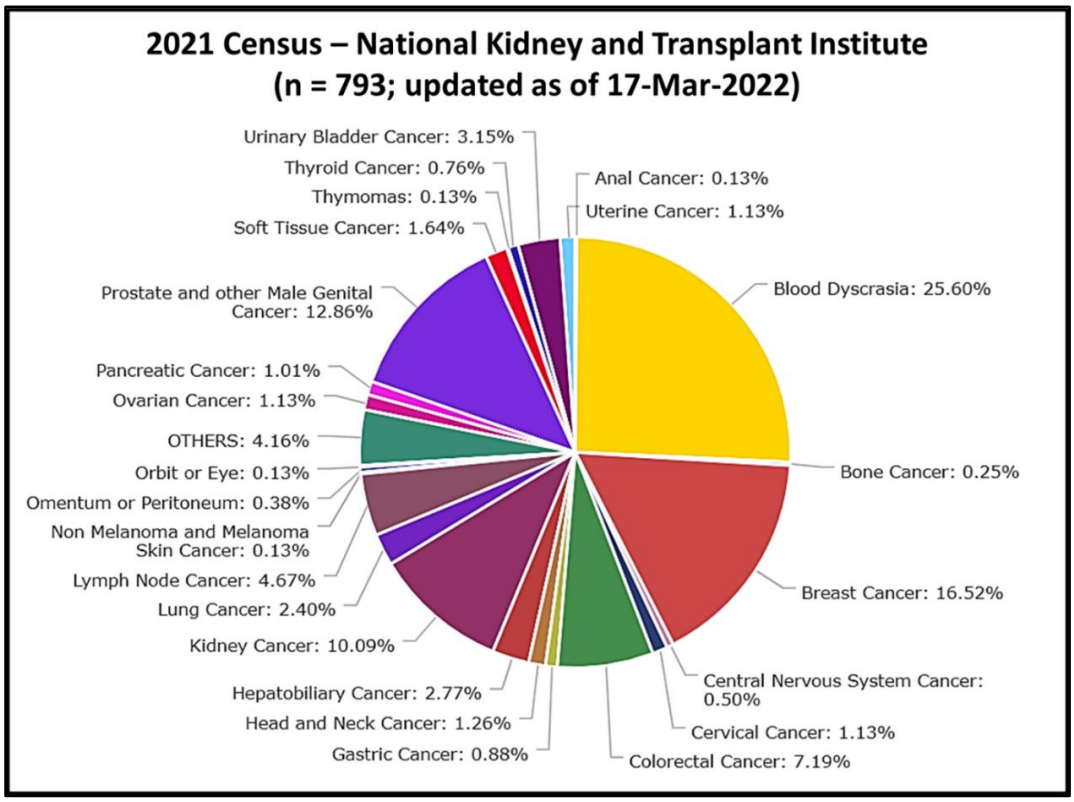


Figure 8. Frequency of primary cancer sites in NKTI cancer census 2021.

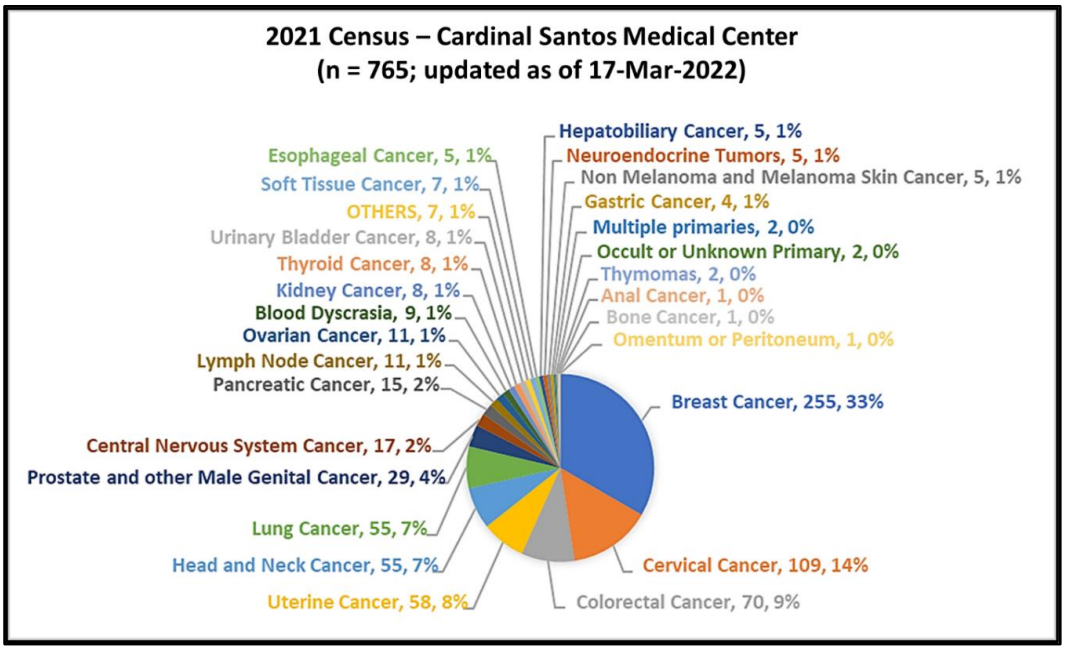


Figure 9. Frequency of primary cancer sites in CSMC cancer census 2021.

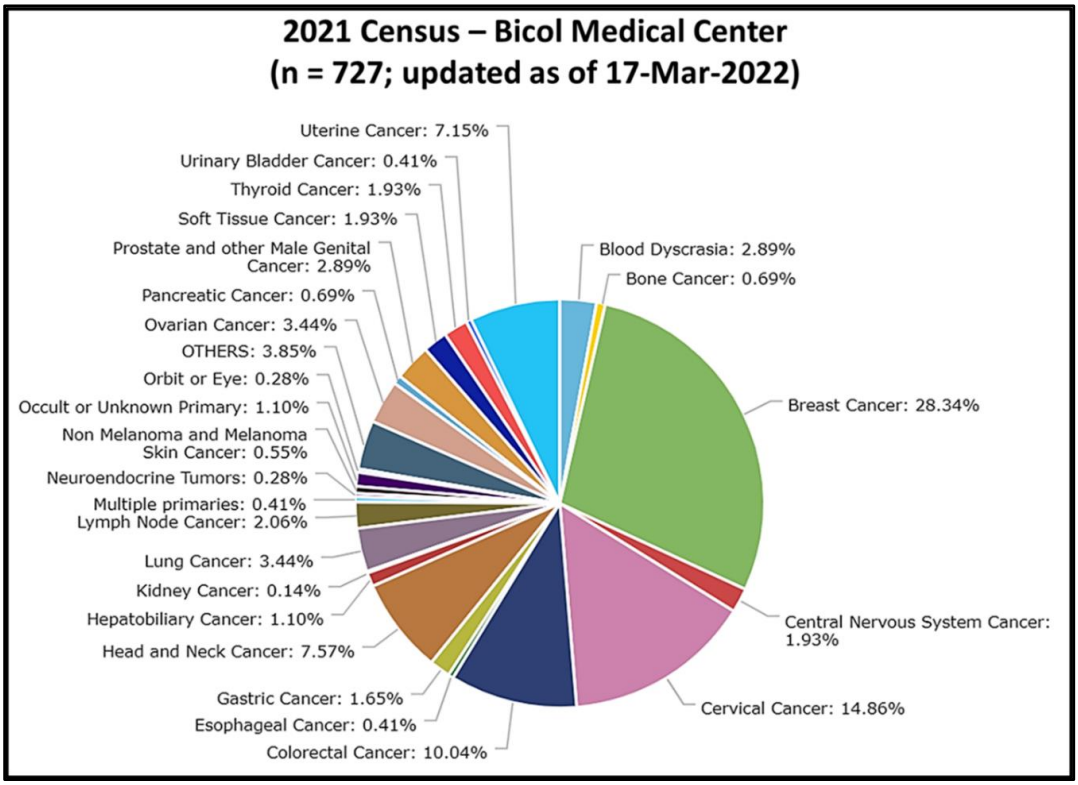


Figure 10. Frequency of primary cancer sites in BiMC cancer census 2021.

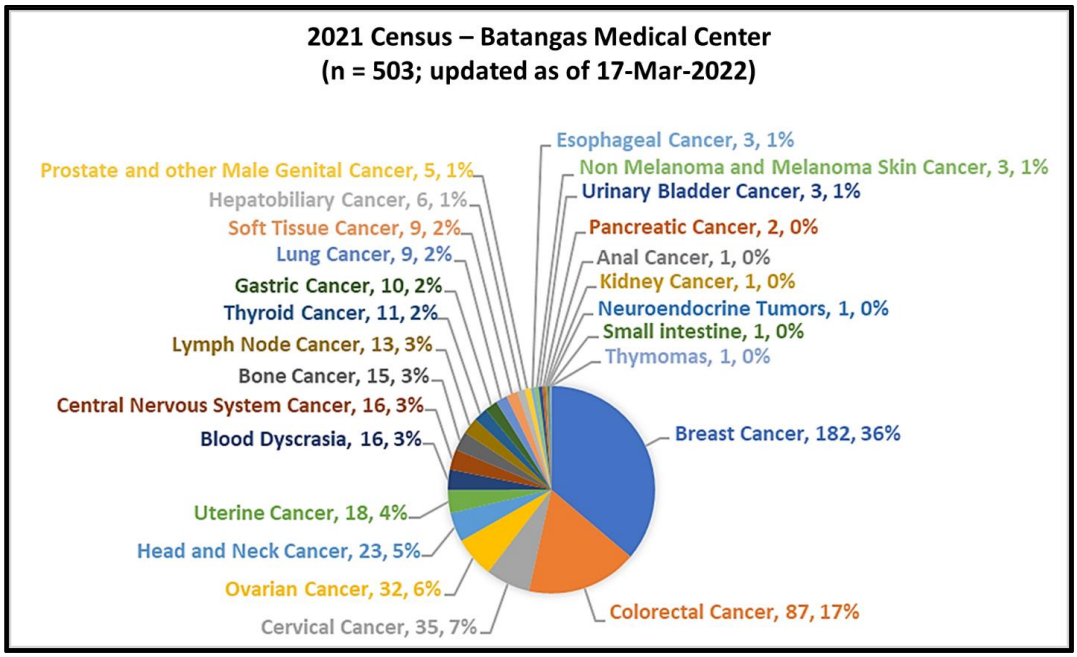


Figure 11. Frequency of primary cancer sites in BatMC cancer census 2021.

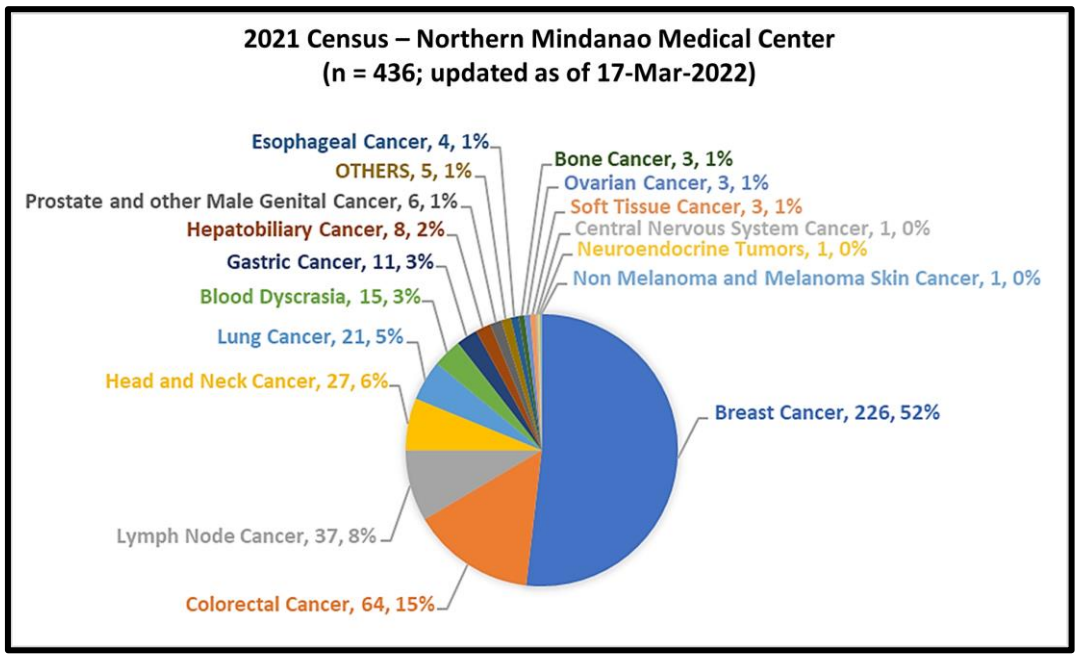


Figure 12. Frequency of primary cancer sites in NMMC cancer census 2021.

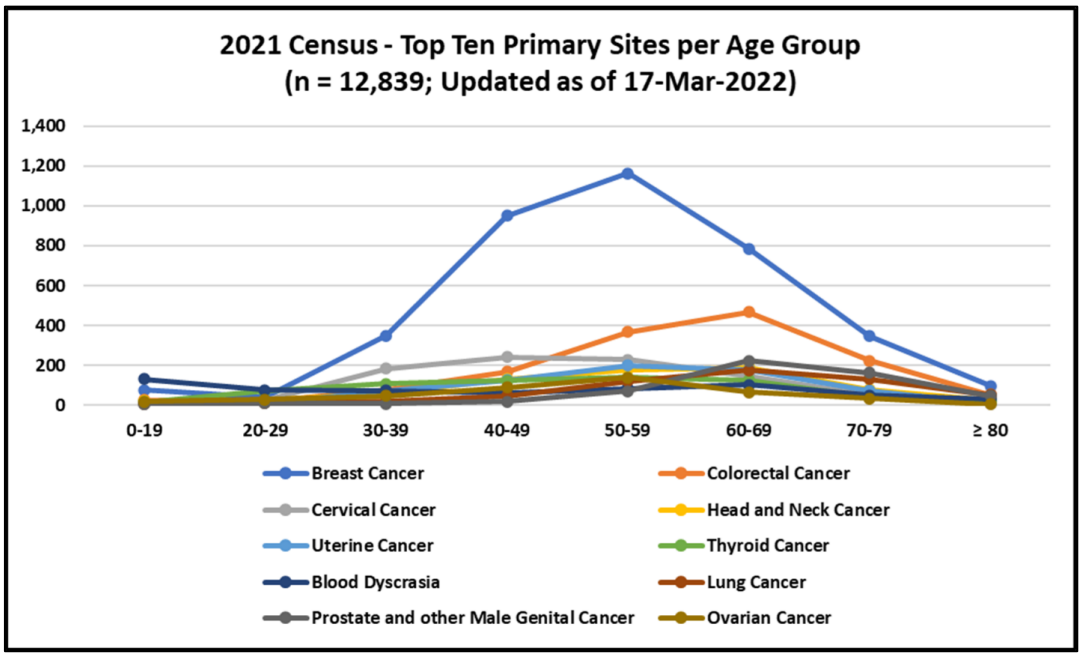


Figure 13. Top 10 primary sites by age group in 2021.

#	Primary Site	0-19	20-29	30-39	40-49	50-59	60-69	70-79	80 +	Total
1	Breast Cancer	76	42	348	951	**1,163**	785	347	96	3,808
2	Colorectal Cancer	25	18	76	168	368	**466**	223	51	1,395
3	Cervical Cancer	4	22	184	**241**	227	145	49	6	878
4	Head and Neck Cancer	21	23	63	130	177	**188**	77	26	705
5	Uterine Cancer	4	9	69	125	**199**	177	72	8	663
6	Thyroid Cancer	15	71	106	123	**139**	126	42	19	641
7	Blood Dyscrasia	**131**	76	73	63	82	102	49	31	607
8	Lung Cancer	7	11	17	47	120	**175**	130	52	559
9	Prostate and other Male Genital Cancer	5	9	6	16	70	**223**	163	47	539
10	Ovarian Cancer	17	27	47	88	**137**	65	33	4	418
	TOP TEN OVERALL	305	308	989	1,952	2,682	2,452	1,185	340	10,213
	TOTAL OVERALL	**472**	**461**	**1,213**	**2,307**	**3,243**	**3,078**	**1,589**	**476**	**12,839**
	%TOP TEN of OVERALL	65%	67%	82%	85%	83%	80%	75%	71%	80%

Table 4. Age distribution of top 10 CARE PH primary sites.

Table 4 above shows the age distribution of the top ten CARE PH cancer sites. Red highlighted cells show the highest number of new registrants per primary site. Yellow highlighted cells show the next highest number of new registrants per primary site. Note that the table lists the age at which the cancer patients are entered into the CARE PH Cancer Registry system. Since the registry enlists only those newly diagnosed or treated in the CARE PH site, the underlying assumption is that the patient is diagnosed in a CARE PH hospital and/or treated in a CARE PH hospital within one year of each other.

Breast, cervical and ovarian cancers, all of which are cancers in women, have peak incidence between ages 40-59 years, while all other cancers found in men or men and women peak between 50 to 69 years old.

A patient with the same initials, birthday, and primary site is considered to be the same person by the central CARE PH database. A close look at the 2021 CARE PH data reveals that a total of 87 patients were registered in 2 (85/87) or 3 (2/87) CARE PH hospitals (Table 5).

#	Primary Site	Seen in 2 Hospitals	Seen in 3 Hospitals
1	Anal Cancer	-	-
2	Urinary Bladder Cancer	1	-
3	Blood Dyscrasia	1	-
4	Bone Cancer	-	-
5	Breast Cancer	39	1
6	Central Nervous System Cancer	-	-
7	Cervical Cancer	4	1
8	Colorectal Cancer	15	-
9	Esophageal Cancer	-	-
10	Gastric Cancer	-	-
11	Head and Neck Cancer	5	-
12	Hepatobiliary Cancer	1	-
13	Kidney Cancer	-	-
14	Lung Cancer	1	-
15	Lymph Node Cancer	1	-
16	Neuroendocrine Tumors	-	-
17	Non-Melanoma and Melanoma Skin Cancer	2	-
18	Occult or Unknown Primary	-	-
19	Multiple primaries	-	-
20	Omentum or Peritoneum	-	-
21	Ovarian Cancer	-	-
22	Pancreatic Cancer	2	-
23	Prostate and other Male Genital Cancer	4	-
24	Soft Tissue Cancer	2	-
25	Thymomas	-	-
26	Thyroid Cancer	2	-
27	Uterine Cancer	4	-
28	OTHERS	1	-
29	Small intestine	-	-
30	Orbit or Eye	-	-
	TOTAL	85	2

Table 5. Patients per primary site in more than 1 hospital cancer registry.

Expansion. The inevitable step of moving forward. CARE Research took that step this 2021, in more aspects than one. Studies have expanded in terms of participant recruitment, data acquisition, hospital site coverage, funding sources, organization and society collaborations, physician linkage and involvement, and many more.

With expansion comes volunteer staff who are willing to go the extra mile to carry out CARE PH's vision-mission. Addition to CARE Research team are Dr. Ethel Viray, Data Specialist; Dr. Shanaia Daguit, Recruitment Specialist; and Bianca Pacao, Admin Officer (See Figure 17. CARE PH Organizational Chart).

2021 Ongoing Studies

CALMER Study

Our study about non-small, non-squamous lung cancer was able to survive 2021. Additional sites were opened to increase enrollment, namely:

- Philippine General Hospital
- Palawan Medical Mission Group-Multipurpose Cooperative

Because of surges in COVID-19 cases, participant referrals where affected as lesser patients sought in-person consultation in hospital sites. Recruitment was also temporarily paused around October due to budgetary limitations. Regardless, CALMER Study was able to enroll 27 new participants for 2021.

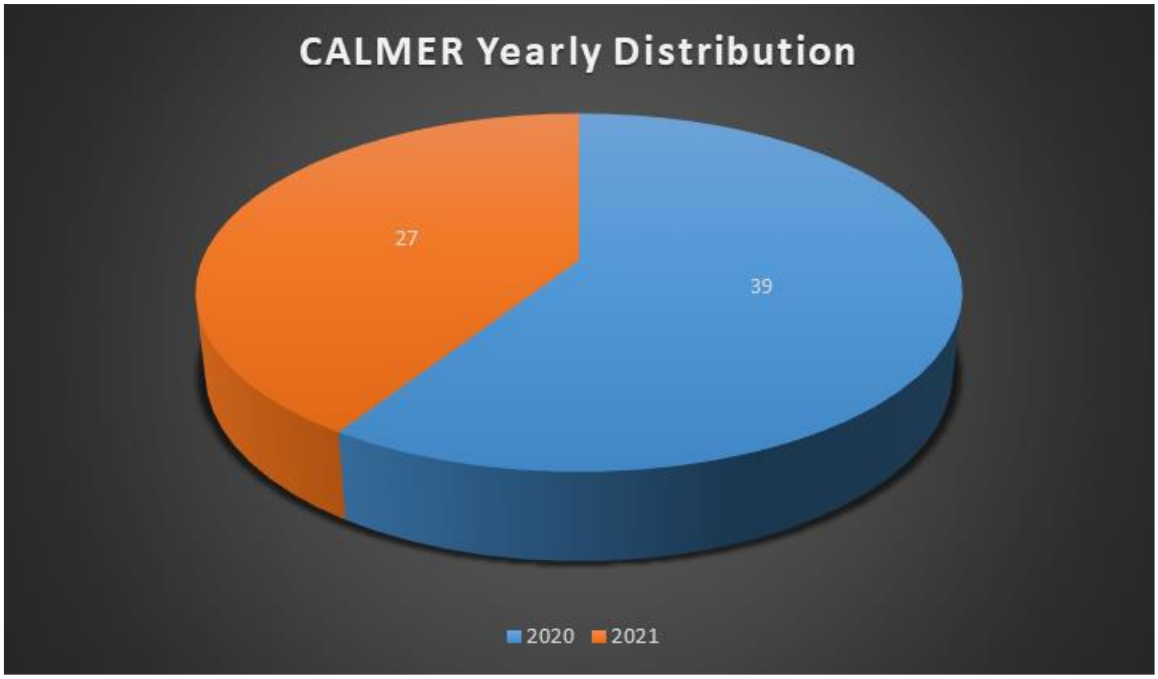


Figure 14. Yearly recruitment distribution of CALMER Study.

CANDLE Study

On its Year 3, the Project 1 of the CANDLE Study entitled, “Establishing a Clinical and Genomic Profile of Filipinos for Early Detection of Liver Cancer”, made a lot of adjustments to be able to meet its target recruitment for the year. Tele-informed consent was proposed and approved at the start of the year to accommodate more participants who were unable to go to hospital sites. Additional sites were opened to be able to cater to more participants outside Metro Manila, namely:

- Palawan Medical Mission Group-Multipurpose Cooperative (Palawan)
- Sacred Heart Hospital Malolos (Bulacan)

The number of participants per category was also adjusted based on the 2020 census of liver cancer patients in the Philippines. Later in the year, teleconsultation was then proposed and subsequently approved to cater to participants in the safety and comfort of their homes. At the end of the year, the study was able to successfully accomplish their target number of participants, despite challenges.

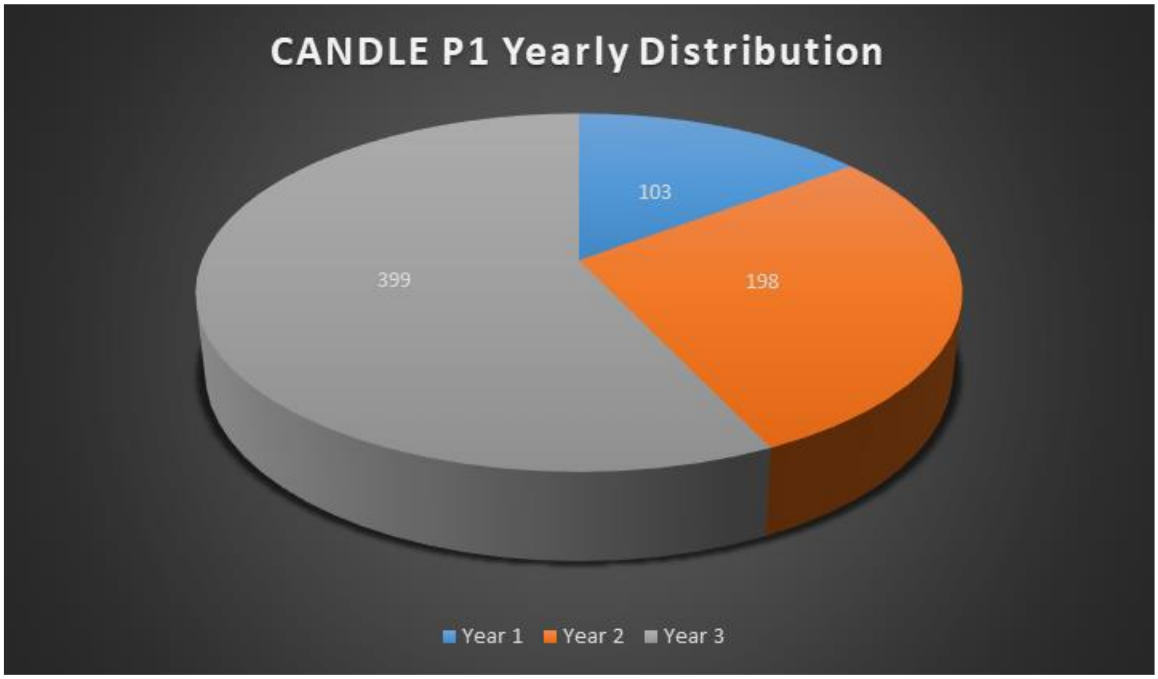


Figure 15. Yearly recruitment distribution of CANDLE P1.

BLOOM Study

The nature of recruitment for this study is data driven. As such, BLOOM Study was able to increase its enrollment despite the pandemic. Additional hospital sites were included which, in effect, increased the total enrollees for 2021. These sites were:

- University of Santo Tomas Hospital
- Philippine General Hospital
- Makati Medical Center

In 2021, our request for an amendment to waive consent was also approved by different ethics committees of the respective sites since enrollment of the 2020 blood malignancy cohort was done in a retrospective manner, de-identified, then data was analyzed. As of the present time, the study is on the process of cleaning up the database, which currently has 587 de-identified enrollees from 5 of 6 participating sites.

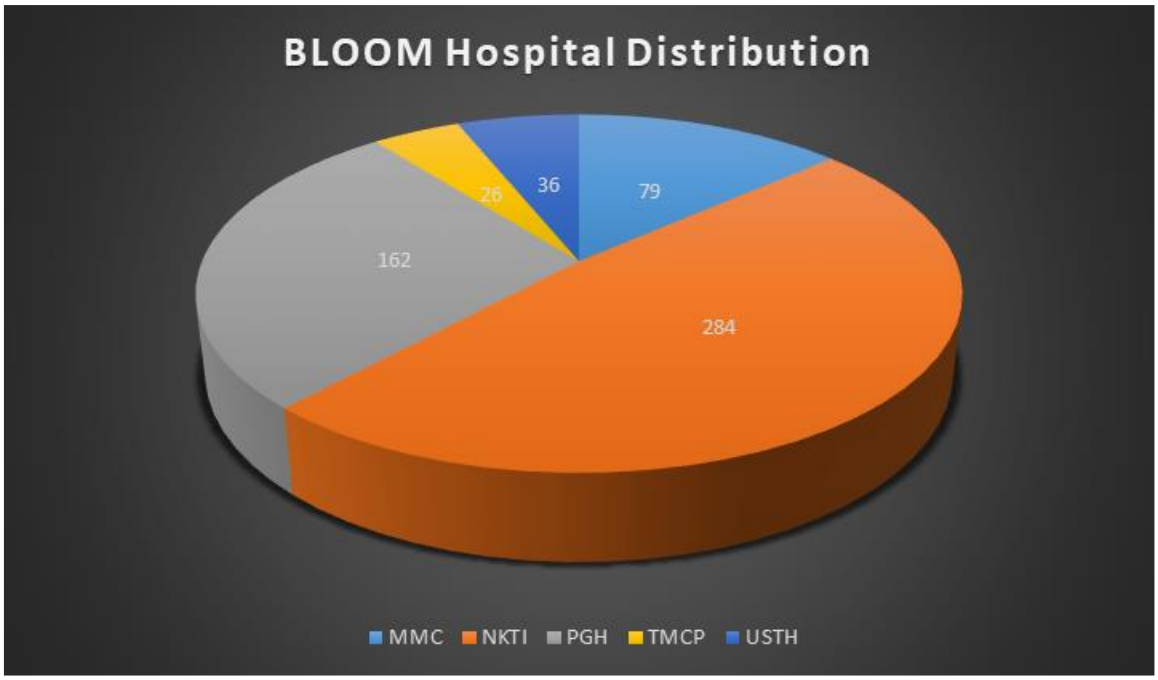


Figure 16. Current distribution of BLOOM PH participants per hospital database.

2022 RESEARCH PLANS

2022 Studies

Year 2022 is an exciting and, at the same time, challenging year for the CARE PH Research team. CANDLE P1, CALMER, and BLOOM studies will continue to recruit and enroll participants with its 2022 target:

STUDY	TOTAL SAMPLE (OLD)	TOTAL SAMPLE (AMENDED)	2022 TARGET
CANDLE P1	800	800	100
CALMER	385	118	52
BLOOM	500	500	Data Clean-up

Table 6. Target of ongoing studies for 2022.

Additional four (4) new studies have been funded and are ready to be implemented. CANDLE Study will have its Project 3 that will look into glycoproteomic profile of patients with hepatocellular carcinoma, with or without chronic hepatitis B. CHERISH2 Study is a validation study of the previously completed CHERISH Study (See 2020 CARE PH Annual Report) on the accuracy of the AI-assisted diagnosis of COVID-19 Pneumonia. PUMA Study is gathering baseline epidemiologic data on the diagnosis and treatment of urological malignancies in the Philippines. BEST Study aims to do the same as PUMA Study, particularly for bone and soft tissue sarcomas.

Upcoming Studies in Bird's Eye View

CANDLE P3

Title:	**Project 3: Glycoproteomic Profile of Patients with Hepatocellular Carcinoma with and without Chronic Hepatitis B** **Program: Early CANcer Detection in the LivEr of Filipinos with Chronic Hepatitis B using AI-driven integration of Clinical and Genomic Biomarkers (CANDLE Study)**
Principal Investigator:	Dr. Beatrice Tiangco
Co-investigators:	Dr. Edhel Tripon; Dr. Klaus Lindpaintner
Sponsor:	InterVenn Biosciences, Inc.
Objectives:	General: To generate glycoproteomic profiles of a set of approximately 80 plasma proteins with relatively high abundance (including proteins such as alpha-1-antitrypsin (A1AT), haptoglobin (Hp)) of patients with hepatocellular carcinoma with and without chronic Hepatitis B, and to compare this with the glycoproteomic profile of subjects without HCC with and without chronic Hep B infection. Specific: 1. To identify altered glycosylation isoforms of the assessed proteins among HCC patients with and without chronic Hep B; 2. To identify altered glycosylation isoforms of the assessed proteins among patients with HCC without chronic Hep B and "normal" subjects; and 3. To compare glycosylation isoforms among HCC patients with Hep B infection and healthy subjects.
Rationale:	This is an exploratory study of the glycoproteomic profile of hepatocellular carcinoma patients with and without chronic Hepatitis B. It is the third project of a Research Program entitled Early Cancer Detection in the Liver of Filipinos with Chronic Hepatitis B Using AI powered Clinical and Genomic Biomarkers (CANDLE PROGRAM).
Study Population:	The patients in this study represent a nested case-control cohort from the 800 patients participating in a large research program on Hepatitis B and HCC (CANDLE Program). The initial subset of 25 patients with HCC and chronic Hepatitis B and 25 patients with HCC but without chronic Hepatitis B will be included in this pilot study, as a proof of concept. Two control groups, one comprising 25 individuals with healthy, normal livers without HCC but with Hepatitis B, and another composed of 25 individuals with healthy, normal livers without HCC nor Hepatitis B will be included.
Output/Implication:	Glycoproteomics is a very young field of study in cancer research. Like other "-omics" studies, this one is the first of a series of studies that may eventually lead to a greater understanding of HCC and make available new ways to diagnose, prognosticate, and/or treat HCC.

CHERISH2 Study

Title:	A Prospective Study on the Accuracy of the CHERISH AI-assisted Diagnosis of COVID-19 Pneumonia (CHERISH2)
Principal Investigator:	Dr. Beatrice Tiangco
Co-investigators:	Dr. Ethel Dominique Viray; Dr. Cybele Lara Abad; Dr. Ron Yebes; Dr. Christine Chavez; Jason Albia; Mario Domingo; Lei Rigi Baltazar
Sponsor:	Philippine Council for Health Research and Development (DOST-PCHRD)
Objectives:	General: To evaluate the clinical utility of the AI-driven predictive models created in the CHERISH Study Specific: 1. Create a repository of CXR along with clinical data for prospective research and disease surveillance 2. Create an application that will automatically facilitate clinical validation workflow 3. Compare the performance of non-AI-assisted diagnosis to AI-assisted diagnosis of COVID-19 pneumonia
Rationale:	An artificial intelligence (AI) tool that can screen for COVID pneumonia by interpreting chest x-ray image findings has been created in a Retrospective Study on the Accuracy of AI-Powered Reading of Chest X-Rays in the Diagnosis of COVID-19 Pneumonia in a Tertiary Hospital (CHERISH Study). This study (CHERISH2) will validate the CHERISH AI tool in the clinical setting in a prospective manner.
Study Population:	A total of 560 patients being admitted to the hospital and being recommended for or requesting for COVID-19 RT-PCR test and chest x-ray examination will be the population of this study.
Output/Implication:	A clinically validated AI-assisted CXR reader will improve the accuracy of detecting COVID pneumonia in the ER triage area in a shorter period of time and will help minimize false positive and false negative initial diagnoses while waiting for the results of the COVID-19 RT-PCR tests to come out.

PUMA Study

Title:	Diagnosis and Treatment of Urologic Malignancies in the Philippines (PUMA Study)
Principal Investigator:	Dr. Jose-Vicente Prodigalidad; Dr. Beatrice Tiangco
Co-investigators:	Dr. Rudolfo De Guzman; Dr. Necy Juat
Sponsor:	Philippine Society of Urologic Oncology (PSUO)
Objectives:	General: To create a registry containing demographic and clinical data of a nested cohort of patients newly diagnosed to have urologic malignancies in the year 2021. Specific: 1. To determine the incidence of cancers of the prostate, kidney, urinary bladder, ureter, upper urinary tract, penis, and testicles in the Philippines 2. To describe the demographic and clinical data of patients in the study 3. To determine the treatment received by patients with urologic malignancies 4. To determine the most common surgical morbidities of patients undergoing surgical treatment for their urologic cancers 5. To determine the response to treatment and disease status at the end of a two-year follow-up period 6. To determine the association of demographic and laboratory parameters to the survival data of the study participants 7. To determine the association of treatment received to survival data
Rationale:	This study aims to gather baseline epidemiologic data on the diagnosis and treatment of urologic malignancies in the country. Incidence, stage upon diagnosis, treatment given, time to treatment, remission rates, relapse rates, and overall survival data will reveal gaps in current diagnosis and management practices that will help prioritize programs and policies, improving quality of life and survival rates of these common dreaded diseases.
Study Population:	All adult Filipinos diagnosed with urologic malignancies (as defined in the ICD-10 Neoplasm list) diagnosed between 1 January 2021 and 31 December 2021 will be entered into the Registry of Urologic Malignancies
Output/Implication:	The benefits of this study will reach not just the individual patients diagnosed with urologic malignancies, but will also help in the creation of clinical practice guidelines, leading to evidence-based public health policy and better healthcare for the Filipino cancer patient

BEST Study

Title:	Diagnosis and Treatment of Urologic Malignancies in the Philippines (PUMA Study)
Principal Investigator:	Dr. Edward Wang; Dr. Beatrice Tiangco
Co-investigators:	Dr. Czar Louie Gaston, et. al.
Sponsor:	---
Objectives:	General: To determine among patient, tumor, and treatment variables possible prognisticators for oncologic outcomes including recurrence, systemic recurrence, and overall survival. Specific: 1. To collect the above demographic and clinical data from patients in 8 different hospitals originally in CARE PH which have at least 2-3% of all cancer patients diagnosed as having sarcoma, whether bone or soft tissue 2. To create a sarcoma registry of all these patients including the years 2020 and 2021 3. To determine the treatment received by patients with bone or soft tissue sarcoma 4. To determine the most common treatment-related morbidities of patients with bone or soft tissue sarcoma
Rationale:	This study aims to gather baseline epidemiologic data on the diagnosis and treatment of bone and soft tissue sarcomas in the country. Incidence, stage upon diagnosis, treatment given, time to treatment, remission rates, relapse rates, and overall survival data will reveal gaps in current diagnosis and management practices that will help prioritize programs and policies, improving quality of life and survival rates of these common dreaded diseases.
Study Population:	All patients newly diagnosed to have bone and soft tissue sarcoma and registered in their hospital cancer registry from 01-January-2020 and 31-December-2021 (as defined in the ICD-10 Neoplasm list) will be entered into the site-specific Registry of Bone and Soft Tissue Sarcoma.
Output/Implication:	The benefits of this study will reach not just the individual patients diagnosed with bone and soft tissue sarcoma, but will also help in the creation of clinical practice guidelines, leading to evidence-based public health policy and better healthcare for the Filipino cancer patient

FINANCIAL SUMMARY (per 2021 AFS)

Item	Amount (Php)
Cash, beginning	**1,665,223**
Total Grants	**2,206,987**
TMC (for CHERISH Study), 05-Jan:	100,000
J&J (for PUMA Study), 14-Jan:	150,000
PCHTM (for BLOOM PH Study), 02-Feb:	180,000
UP-Manila (for CANDLE Study), 09-Feb:	450,000
UP-Manila (for CANDLE Study), 26-Jul:	450,000
PFI, 02-Sep:	358,200
PCHTM (for BLOOM Study), 17-Dec:	240,000
Various donors:	278,787
Expenses	**3,689,998**
Programs and fees:	3,430,767
Administrative:	259,232 (7%)*
Cash, ending	**182,828**

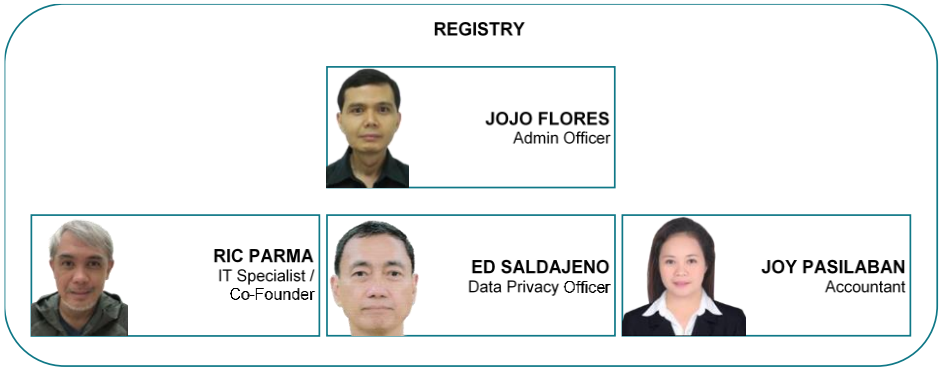
BOH 2021 (January) • **RCBC: 594,062.45** • **BPI: 999,950.00**	**1,594,012.45**
CONTRIBUTIONS AND GRANTS • PFI: 358,200.00 • J&J for PUMA Study: 150,000.00 • TMC for CHERISH Study: 100,000.00 • UP-Manila for CANDLE Study: 900,000.00 • PCHTM for BLOOM Study: 180,000.00 • Returned Cash Advance on 19-Oct-'20 per cheque# ending 0135: 200,000.00 • Various Donors: 13,093.64 • Anonymous Donation: 1,700.00	1,902,993.64
EXPENSES • Registry: 1,585,434.46 • Research: 1,033,248.00 • Administrative: 446,758.19 (14.57%*)	3,065,440.65
EOH 2021 (September) • **RCBC: 61,480.68** • **BPI: 437,900.00**	**499,380.00**

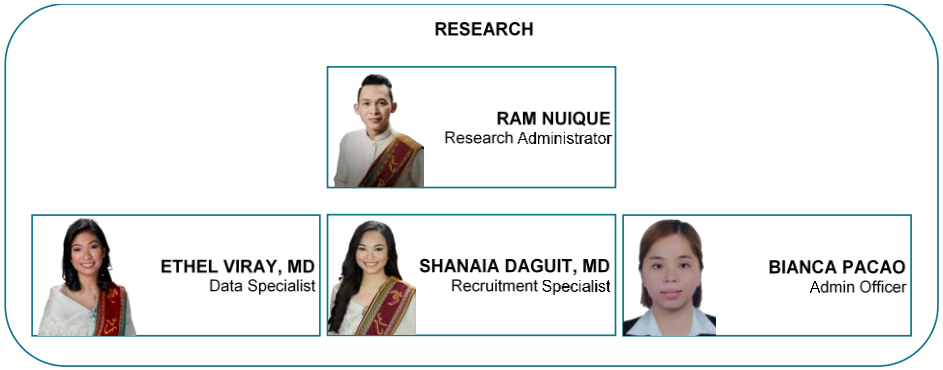
Table 7. CARE PH Financial Report.

* ***Compliant to Tax Code SEC 34-H.2.c.3***

"The level of administrative expense of which shall, on an annual basis, conform with the rules and regulations to be prescribed by the Secretary of Finance, upon recommendation of the Commissioner, but in no case to exceed thirty percent (30%) of the total expenses"

CARE PH ORGANIZATIONAL CHART





Member Hospitals

Individual Members

REFERENCES

1. Global Cancer Observatory (2021, March). *Philippine Population Fact Sheets.* https://gco.iarc.fr/today/data/factsheets/populations/608-philippines fact-sheets.pdf.
2. 2020 CARE PH Annual Report.