

# Trends in Knowledge, Attitude and Perceptions about HIV among Filipinos During and After the COVID-19 Pandemic: Responses from a Digital Survey

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## ABSTRACT

**Background.** The Philippines has been significantly affected by the HIV epidemic in the Asia-Pacific region, with a notable increase in new cases over the past decade. Despite efforts to promote HIV testing, access to treatment, and awareness campaigns, progress has been slow, particularly among youths. Tangere, a market research application, conducted surveys during and after the COVID-19 pandemic to assess HIV knowledge among Filipinos.

**Objectives.** This study aimed to evaluate changes in HIV awareness among young Filipinos during and after the COVID-19 pandemic using data collected via Tangere's surveys. Specifically, it sought to analyze demographic characteristics, sources of HIV information, and knowledge regarding HIV transmission, prevention, and stigma.

**Methods.** Tangere collaborated with the investigators to develop a questionnaire assessing HIV knowledge among young Filipinos. Surveys were conducted during and after the COVID-19 pandemic, targeting subscribers aged 18-35 years, primarily from the National Capital Region and Luzon area. Data analysis involved calculating frequencies and percentages to summarize demographic characteristics and HIV knowledge. An Independent-Samples Proportions procedure was used to compare HIV knowledge during and after the pandemic.

**Results.** The survey revealed that while respondents generally possessed reasonable knowledge about HIV, there were notable changes in the awareness during and after the pandemic. Social media and television were identified as primary sources of HIV information. Knowledge regarding HIV transmission and prevention increased post-pandemic, particularly concerning preventive measures such as pre-exposure prophylaxis (PREP) and mother-to-child transmission (MTCT). However, persistent misconceptions and stigma surrounding HIV remained, indicating the need for continued education and advocacy efforts.

**Conclusion.** The study underscores the importance of utilizing social media platforms for HIV awareness campaigns, especially among youths who are disproportionately affected by the epidemic. Despite improvements in knowledge, the Philippines has yet to achieve global HIV prevention goals. Continued efforts to enhance awareness, particularly regarding recent advancements in HIV prevention and treatment, are essential for curbing the epidemic and improving public health outcomes nationwide.

**Keywords:** *knowledge, attitude, perceptions, HIV, Filipinos, COVID-19 pandemic*

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## INTRODUCTION

The Philippines has been the nation in the Asia-Pacific region most affected by the HIV epidemic during the past decade.<sup>1</sup> In 2012, nine new HIV-infected people were diagnosed every day. In 2023, 50 new patients with HIV were diagnosed each day – a 500% increase.<sup>2</sup> Thirty-one percent of new HIV infections occurred in individuals between the ages of 15 to 24 years.<sup>3</sup> Of the reported new infections in youths, 96% occurred in males and 83% occurred in men who have sex with men (MSM). Seventeen percent of those with newly diagnosed HIV infection had advanced HIV at the time of diagnosis. Despite new programs to promote HIV testing, wider access to antiretroviral therapy, promotion of HIV treatment as prevention, and expanded national insurance coverage for HIV treatment costs, progress has been slow and it is estimated that only 68% of PLHIV (person living with HIV) in the Philippines know their HIV serostatus.<sup>4</sup> The uptake of pre-exposure prophylaxis (PREP) against HIV in the Philippines is low despite the encouraging results reported from pilot implementation projects.<sup>3</sup> A behavioral study by DOH (IHBSS 2018) also reported that knowledge about HIV prevention among youths, including health-seeking behavior, decreased to 32%<sup>5</sup> in 2018 from 40%<sup>6</sup> in 2015.

Tangere ([www.tangereapp.com](http://www.tangereapp.com)) is a market research application developed by a start-up company of young Filipino entrepreneurs. It began as an opinion poll survey tool during the COVID-19 pandemic with a vision to become a strategic tool to manage societal change in the Philippines by collecting actionable insights from Filipinos across the country and serve as a platform for community-building that is in touch with Filipino sentiments. In December 2020, as their contribution to World HIV Awareness Day, Tangere launched a survey to assess the level of general knowledge about HIV among their usual respondents. The survey was repeated post-pandemic beginning in June 2022. We report the results of the survey during and after the COVID-19 pandemic and comment on the current level of HIV awareness in the Philippines.

## METHODS

In November 2020, Tangere collaborated with the investigators to develop a questionnaire to assess the level of knowledge of young Filipinos about HIV. The questionnaire included items about general knowledge on HIV, its transmission, prevention, and stigma. The survey was a single engagement survey run for one day (World AIDS Day). The questionnaire was designed such that it was clear and concise. The questionnaire covered four domains: general knowledge on HIV, its transmission and prevention, stigma, and awareness of government programs available for HIV. The usual number of respondents for such a survey would be 3,000 to 4,000 subscribers. To ensure the validity of its surveys, Tangere uses several measures including using

neutral questions and using Filipino and non-intimidating language to encourage participation and completion of its surveys, conducting regular identity checks of its community through random sampling, checking patterns of identity falsification or duplication and deleting those identities from the respondent panel, and conducting monthly "eyeballs" at different locations across the country, as a way to get to know more about the community members, as well as verify that they are real individuals.

The target population for the HIV knowledge survey was the 350,000 subscribers of Tangere as of December 2020. There was no methodological determination of the sample. The questionnaire was released on December 1, 2020 and December 1, 2022 as an advocacy survey of the Tangere. Subscribers were mostly from the National Capital Region including the greater Metro Manila area (23%) and the North and Central Luzon area (26%). Eighty-one percent of subscribers are in the 18 to 35 years old age group (53% are 18 to 25 years old and 28% are 26 to 35 years old). Forty-six percent of Tangere subscribers belonged to socio-economic class E (poor and low income who often work in the informal economy and live in informal housing). Tangere and the investigators repeated the same survey in 2022 to assess change in knowledge about HIV during and after COVID-19 pandemic. The survey respondents were not necessarily the same individuals as the first survey.

Frequencies and percentages were calculated to summarize the demographic characteristics of the participants from the 2020 and 2022 surveys and their knowledge about HIV (Table 1). HIV knowledge and the participant's source of that HIV knowledge during and after the COVID-19 pandemic was compared using an Independent-Samples Proportions procedure (SPSS, ver 27.0, IBM, Chicago, U.S.A.). Survey items included awareness of the difference between HIV infection and AIDS, how HIV infection is transmitted, how people can prevent HIV, people at increased risk for HIV infection, knowledge about availability and effectiveness of HIV medications, perspective on PLHIV, and public programs for HIV. P-values less than 0.05 were considered significant.

## RESULTS

### Survey Population

Four thousand five hundred respondents completed the 2020 survey and 2000 respondents completed the 2022 survey. The data in Table 1 shows various demographic shifts between the two years in age groups, gender distribution, region, civil status, and socioeconomic class. Respondents were mostly 26 to 35 years of age during the two surveys. There was a notable decrease in the proportion of 18 to 25 years old respondents completing the second survey (35% to 15%,  $p < 0.01$ ). There was an increase in male respondents (52% to 59%,  $p = 0.01$ ). There was a decrease in the proportion of single individuals

**Table 1.** Characteristics of People Participating in the Tangere Mobile Application HIV Knowledge Survey in Nov 2020 (N=4500) and Dec 2022 (N=2000)

Demographics	2020 <sup>a</sup> , N (%)	2022 <sup>b</sup> , N (%)	P-value
<b>Age Group [years; n (%)]</b>			
13 to 17	178 (4%)	4 (1%)	<0.01
18 to 25	1581 (35%)	308 (15%)	<0.01
26 to 35	1861 (41%)	1022 (51%)	<0.01
36 to 50	797 (18%)	579 (29%)	<0.01
51 and up	83 (2%)	87 (4%)	<0.01
<b>Sex</b>			
Male	2317 (52%)	1179 (59%)	<0.01
Female	2183 (48%)	821 (41%)	<0.01
<b>Region</b>			
National Capital Region	1264 (28%)	498 (25%)	<0.01
Luzon	2263 (50%)	986 (49%)	0.46
Visayas	505 (11%)	275 (14%)	<0.01
Mindanao	468 (10%)	241 (12%)	0.05
<b>Civil Status</b>			
Single	2540 (56%)	815 (41%)	<0.01
Single (with child)	587 (13%)	340 (17%)	<0.01
Married (without child)	784 (18%)	474 (24%)	<0.01
Married (with child)	589 (13%)	371 (19%)	<0.01
<b>Socioeconomic Class</b>			
ABC	42 (1%)	418 (21%)	<0.01
D	1969 (44%)	789 (39%)	<0.01
E	2489 (54%)	793 (40%)	<0.01
<b>*Sexual Orientation</b>			
Straight/Heterosexual	3039 (68%)	-	0.00*
Bisexual	442 (10%)	-	0.00*
Homosexual	198 (4%)	-	0.00*
Gender fluid or gender-expansive	67 (2%)	-	0.00*
Uncertain	93 (2%)	-	0.00*
I do not wish to disclose	380 (8%)	-	0.00*
Others	281 (6%)	-	0.00*

\*Not included in the 2022 Survey; <sup>a</sup> sample size for year 2020 is 4500; <sup>b</sup> sample size for year 2022 is 2000

and a corresponding increase in those who are married, either with or without children (56% to 41%; 18% to 24%;  $p=0.01$ ). This indicates a shift towards more individuals being in partnership by 2022. Most of the respondents resided in the National Capital Region and Luzon area and belonged to the socioeconomic (SEC) classes D and E which is similar to the overall distribution of SEC classification among the broader population of persons subscribing to Tangere. More respondents belonging to SEC ABC completed the second survey.

### HIV Knowledge

HIV knowledge and awareness showed notable shifts between 2020 and 2022, highlighting improvements in some areas and persistent misconceptions in others as shown in Table 2. The use of social media, news, and medical professionals as sources of health information has significantly increased between 2020 and 2022 (71% to 82%;  $p<0.01$ ), while other sources like TV/Radio, school, and family

remained stable. Respondents demonstrated considerable knowledge that HIV infection and AIDS are two different things. Respondents were mostly aware of the ways HIV is transmitted from person to person, including acquiring infection through unprotected sex, sharing syringes and needles, and mother-to-child transmission. The respondents in the first survey were more aware of modes of transmission that have been debunked as myths, including kissing, using the same eating utensils or toilet, coughing and sneezing, casual interaction with PLHIV, and swimming with PLHIV than the respondents in the second survey.

Knowledge about preventive measures such as who can contract HIV and the availability of anti-retroviral medicines increased from the pandemic survey to the post-pandemic survey. Worth noting is the increase in HIV prevention knowledge by at least 20% with regard to the proper disposal of used syringes and needles, and knowledge about pre-exposure prophylaxis for HIV, and HIV vaccines.

**Table 2.** HIV Knowledge Survey through Tangere Mobile Application Done in Nov 2020 (N=4500) and Dec 2022 (N=2000)

	2020 <sup>a</sup> , N (%)	2022 <sup>b</sup> , N (%)	P-Value
<b>Source of Health Information</b>			
Social Media	3201 (71%)	1641 (82%)	<0.01
TV / Radio	2776 (62%)	1243 (62%)	0.75
News	1368 (30%)	781 (39%)	<0.01
School	2260 (50%)	1045 (52%)	0.14
Friend / Family / Parents	1747 (39%)	821 (41%)	0.10
*Website / Blogs	-	904 (45%)	0.00*
*Organizations / Support Groups	-	800 (40%)	0.00*
*Medical Professionals	-	1186 (59%)	0.00*
Others	163 (4%)	58 (3%)	0.14
<b>Awareness on the Difference between HIV Infection and AIDS</b>			
Yes	2759 (61%)	1165 (58%)	0.02
No	944 (21%)	470 (24%)	0.02
Not sure	797 (18%)	365 (18%)	0.60
<b>How HIV Infection Occurs</b>			
Unprotected sex	3990 (89%)	1853 (93%)	<0.01
Using same syringes	2384 (53%)	1420 (71%)	<0.01
MTCT	1981 (44%)	1247 (62%)	<0.01
Kissing	1529 (34%)	786 (39%)	<0.01
Using same eating utensils	1197 (27%)	878 (44%)	<0.01
Using the toilet	961 (21%)	724 (36%)	<0.01
Coughing and sneezing	880 (20%)	766 (38%)	<0.01
Casual Interaction with PLHIV	785 (17%)	731 (37%)	<0.01
Swimming with PLHIV	546 (12%)	592 (30%)	<0.01
<b>Preventing HIV</b>			
By being loyal to one partner	3338 (74%)	1684 (84%)	<0.01
By practicing sexual abstinence	2692 (60%)	1471 (74%)	<0.01
Using the right contraceptives	2339 (52%)	1405 (70%)	<0.01
By throwing away used injections	2078 (46%)	1385 (69%)	<0.01
By regularly taking PREP	1195 (27%)	976 (49%)	<0.01
By having a vaccine	1155 (26%)	927 (46%)	<0.01
<b>People who can Contract HIV</b>			
Homosexuals and other members of LGBTQA+	3581 (80%)	1716 (86%)	<0.01
Sex workers	3134 (70%)	1614 (81%)	<0.01
Male	2868 (64%)	1624 (81%)	<0.01
Female	2663 (60%)	1565 (78%)	<0.01
Infants or Kids	1894 (42%)	1120 (56%)	<0.01
<b>Knowledge about HIV Medication</b>			
There is maintenance medicine	2577 (57%)	1413 (71%)	<0.01
Early detection will help	2527 (57%)	1556 (78%)	<0.01
PREP to avoid HIV	2430 (54%)	1464 (73%)	<0.01
No vaccine yet	1893 (42%)	1003 (50%)	<0.01
<b>Perspectives on PLHIV</b>			
Healthy lifestyle and adherence to medicine can lead to normal life	3794 (84%)	1725 (86%)	0.04
PLHIV can have a long, enjoyable, and meaningful life	1720 (38%)	1122 (56%)	<0.01
PLHIV will be forever contagious	989 (22%)	695 (35%)	<0.01
PLHIV needs to be quarantined	769 (17%)	790 (40%)	<0.01
PLHIV have no right to be in an intimate relationship	706 (16%)	627 (31%)	<0.01
<b>Public Programs for HIV</b>			
Anyone can take a test if they have HIV	3506 (78%)	1781 (89%)	<0.01
Local treatment hubs for PLHIV are available	3157 (70%)	1652 (83%)	<0.01
HIV counselors/experts are accessible	2424 (54%)	1467 (73%)	<0.01
HIV maintenance medicines are free	2386 (53%)	1391 (70%)	<0.01

HIV – human immunodeficiency virus, PLHIV – person living with HIV, MTCT – mother to child transmission, PREP – preventive prophylaxis

\*Not included in the 2020 Survey; <sup>a</sup> sample size for year 2020 is 4500; <sup>b</sup> sample size for year 2022 is 2000

Stigma-related questions also showed an improvement in knowledge about HIV among respondents for the post-pandemic 2022 survey especially knowledge that PLHIV can have a long, enjoyable, and meaningful life (from 38% to 56%,  $p < 0.01$ ). Persistent misconceptions that increased from the first to the second survey included beliefs that PLHIV will be forever contagious to others (13%,  $p < 0.01$ ), that they need to be quarantined (23%,  $p < 0.01$ ), and that they have no right to be in an intimate relationship (15%,  $p < 0.01$ ).

Over 70% of the respondents knew that HIV diagnosis and treatment services are publicly available at HIV treatment hubs at no or low cost. In the 2020 survey, though respondents were highly aware that HIV tests are available for all, they were not as aware of the availability of HIV counselors and antiretroviral medications. This awareness increased by the 2022 survey.

## DISCUSSION

In this online survey done in the Philippines during and after the COVID-19 pandemic, we found that respondents, who were mostly in the 18 to 35-year-old age group and who access health information through social media and television, have reasonable general knowledge about HIV. In a survey done among students in public graduate institutions in the north Luzon area done in 2018, the respondents' source of information was primarily through television with social media coming in second.<sup>7</sup> General knowledge about HIV, with regards to transmission and prevention, was only moderate among most 18 to 24-year-old students.

Communication strategies of programs dealing with HIV prevention should preferably utilize social media platforms that are regularly and broadly accessed by their target populations. Unlike traditional methods such as newspapers and TV, social media platforms reach the masses rapidly and can readily be linked and shared with others. Utilizing social media effectively could potentially improve HIV awareness among the youth in the Philippines, who are disproportionately affected by HIV in the country. Different age groups respond differently to different HIV prevention messages.

The significant growth of knowledge about PREP from the 2020 to 2022 survey highlights an important trend among individuals such as MSM who are at higher risk of HIV infection. Public awareness about mother-to-child transmission (MTCT) of HIV has also improved, a crucial step in promoting early testing and treatment of pregnant women with HIV. However, despite the improvements noted in the survey concerning HIV prevention, the Philippines has failed to meet the 2020 United Nations (UN) target to ensure that at least 90% of people have knowledge of and access to a range of HIV prevention options<sup>8</sup>, including pre-exposure prophylaxis, voluntary medical male circumcision, harm reduction, and condoms. The survey indicates some progress in HIV knowledge among our younger population; however,

national program data highlights that the country remains behind in achieving this crucial global HIV prevention goal.<sup>3</sup>

Our study has several limitations. First, information about the sexual orientation of respondents was only available in the 2020 survey, and the additional sources of information (i.e., Websites/Blogs, Organizations/Support Groups, and Medical Professionals) were included exclusively in the 2022 survey.

Due to the nature of the mobile application, respondents were restricted to those with smartphones and internet connection and may not be representative of the entire Philippine population; however, the survey appeared on the feeds of all subscribers of the Tangere subscriber base and all who answered the questions completely were considered as sample respondents. Participation in the surveys was voluntary. We could not do further analysis to control for demographic shift from the first to the second survey. Addressing these limitations in future studies or future versions of this survey is crucial for enhancing the comprehensiveness and utility of the collected data to inform policy, practice, and research endeavors.

While this study may not be a full representation of the Philippine population, it nevertheless provides a snapshot of the public's knowledge, attitudes, and perceptions about HIV over recent time. The survey revealed trends and differences in HIV knowledge across various demographic groups. It provided insights into awareness levels and perspectives regarding HIV during and after the COVID-19 pandemic, a time of great disruption and challenges in public health messaging and services.

## CONCLUSION

The insights gathered from our survey data may potentially guide government public health services in their HIV awareness programs concerning what areas to focus on and what platforms and media to use. While there has been considerable progress in public awareness about HIV in the Philippines, the persistence of some misconceptions and myths calls for a continued and diversified approach to education and advocacy. Moreover, it is imperative that we increase public awareness about recent important breakthroughs, notably PREP and the role of antiretroviral medications in achieving an undetectable viral load and lowering the risk of HIV transmission, to improve HIV prevention and treatment throughout the Philippines.

### Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

### Author Disclosure

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