Scrubntizng the knowledge and stigma of HIV/AIDS in the community level in Indonesia and the correlation to risk groups aversion to screening

Lee T Sen¹, Pavita M S Hutauruk¹, Mohammad R A Putra¹, Salsabila B Maulida¹, Areska Ramadhan¹ and Agus Sugiharto*²

¹ Faculty of Medicine, Universitas Indonesia, Jakarta, 10430, Indonesia
² Department of Community Medicine, Faculty of Medicine, Universitas Indonesia, Jakarta, 10430, Indonesia

Abstract. Human immunodeficiency virus (HIV) has continuously been considered a scourge in Indonesia. Negative societal stance might be attributed to the poor biological, psychological, and emotional knowledge of HIV. Here we aimed to demonstrate the level of knowledge, stigma, and barriers for accessing HIV services. We conducted a cross-sectional survey in December 2019 in Kemayoran District, Jakarta, Indonesia. The survey consisted of a demographic section, HIV-Knowledge Questionnaire 18, and Stigma Questionnaires. An in-depth interview was conducted with eight subjects representing high-risk HIV and healthcare professionals; in-vivo and thematic analysis were employed. Overall, 83 respondents participated, 50.6% male, and 61.7% aged 26-45 years old. Instrumental, symbolic, and civility stigma were significantly higher in 25.9%, 19.8%, and 17.3% of samples, respectively. Stigma was associated with HIV knowledge (λ: 0.887, df: 3, partial η²: 0.113), and high knowledge level decreased the odds of instrumental stigma (OR: 0.292, 95% CI 0.095-0.900, p<0.05). Fear of discrimination and limited information was identified as intrinsic factors, while media portrays HIV and extraneous screening hours as extrinsic factors. The knowledge on HIV is still low at the community level in the Indonesian capital, which correlates to higher stigma and inhibits the high-risk population from accessing HIV medical services.

1. Introduction
Since its first emergence in 1980s in Indonesia, the human immunodeficiency virus (HIV) has continued to be a significant health crisis.[1] Based on 2018 data, Indonesia has 640,000 detected people living with HIV/Acquired Immune Deficiency Syndrome (AIDS, PLWHA); however, a predicted 49% of cases remain unknown. The situation worsens with a mortality rate of 38,000, which was an increase of 60% from 2010 to 2018, as only 17% of PLWHA were able to access medications.[2] There are numerous hurdles, particularly in developing Indonesia, to achieve the 90-90-90 goal of UNAIDS[3] that stems from combinations of financial, political, psychological, to social barriers.

These factors culminate in stigma and discrimination towards PLWHAs, and even against the high-risk groups such as male sex with males (MSM), sex workers, young women, and intravenous drug users (IVDU).[3] Indonesia has a substantial religious value, which translates to the resolute negative view of these groups.[4] Indonesian Health and Demographic Survey (IDHS) 2017 demonstrated that around 8 out of 10 adults have a confident discriminative attitude towards PLWHA and risk groups. Though the phenomenon is not isolated to Indonesia, data from UNAIDS displayed that in over 35% of countries
globally, 50% of adults stigmatized PLWHA and the risk groups. Looking deeper into the characteristics, knowledge on HIV/AIDS is also low. IDHS 2017 also detected that only 49% has some basic understanding of HIV transmission with about 20% of adults never having heard of HIV.[5] This trend was also found by several studies in high school students[6,7] and even health-care workers[8,9]. The studies identified a lack of knowledge and religious factors to contribute to discrimination.

As defined by Goffman, stigma is the harmful and prejudicial attitude that discredit, discount and discriminate against PLWHA.[10] Herek, et al.[11] and Siregar, et al.[12] further differentiate HIV-related stigma to instrumental, symbolic, and civility. Instrumental stigma pertains to views that reflect the fear towards fatal and infectious diseases, in this case HIV/AIDS, whilst symbolic stigma stems from the beliefs, moral values, and feelings that an individual possesses towards certain risk groups or lifestyles correlates to PLWHAs. At the same time, civility stigma embodies the attitudes of individual social judgments imposed on PLWHAs. The Global Network for People Living with HIV/AIDS cites that stigma and discrimination are among the biggest challenges facing PLWHA today.[13]

The research conducted in Indonesia had so far investigated knowledge and stigma exclusively or without distinguishing the different stigma facets. This study aimed to correlate the different stigma domains towards a local community level to capture the grassroots level in Indonesia and identify the variables contributing to HIV testing access barriers in high-risk groups.

2. Method

2.1. Study recruitment
The cross-sectional study was conducted with quantitative and qualitative paradigms in mind. The study was conducted in December 2019 at Kemayoran Community Health Centre, Jakarta, Indonesia. Respondents for the survey were recruited consecutively and briefed before answering the survey, while participants of the interview were conveniently sampled. All participants were briefed on the study protocol and aims, required to give written informed consent, and allowed to exit the study at any time without consequences. The study was approved by the faculty committee and community health center director. The sample size was tabulated using the transversal formula[14], and considering a 10% dropout, minimal samples were 78 respondents. Inclusion criteria applied were age older than 18 years old (ensuring adequate sexual health knowledge), reading and writing, and gave written informed consent to join the study. While, exclusion criteria were described as rejecting to enter the study, health professional background and presence of cognitive or sight disorder. A total of 81 respondents consented to join the study. Interviews were conducted towards PLWHAs from risk groups stratified by UNAIDS and health professionals in the Kemayoran Community Health Centre. In the current study, 3 and 5 interviewees represented healthcare professionals and PLWHAs risk groups, respectively.

2.2. Data collection and measurements
HIV Knowledge Questionnaire 18 (HIV-KQ-18) developed by Carey and Schroder,[15] the questionnaire has been translated into Bahasa Indonesia with right internal consistency, Cronbach’s alpha of 0.904.[6,16] Respondents were employed through consecutive sampling from residents within and around the community health center in Kemayoran District, Central Jakarta, Indonesia from 6-13 December 2019, endpoint being the computed sample size. Scoring was based on criteria provided by Carey and Schroder.[15] A questionnaire assessing stigma utilized previously established by Siregar[12] was based on a previous study by Herek[11]. The stigma was divided into three categories, namely, Instrumental, Symbolic, and Civility. Each category was represented by seven statements and scored in a 4-degree Likert scale validated in the Indonesian population with satisfactory validity, Cronbach’s alpha score was 0.8298, 0.8412 and 0.8999 respectively.[12]

An in-depth interview was conducted to retrieve as extensive as possible factors as barriers to HIV screening in risk groups. The interview utilized semi-structured questions that outlined the domains to explore and accorded examples of questions, allowing interviewers to adapt to each interviewee and expand questions as appropriate. Questions for the risk groups populations were derived from the Euro HIV EDAT Project[17] and the qualitative study of Kiplagat and Huschke[18]. On the other hand, questions for health professionals were adapted from Bofill, LM. et al.[19] and a qualitative report by
the Wisconsin Department of Health Services[20]. The exclusion criterion was PLWHAs who were not affiliated with one of the risk groups described by UNAIDS and drop-out criterion if the interview was not completed. The interview was conducted by the authors after discussion and briefed on the interview semi-structured questions, a printed version was available for guidance during the interview.

2.3. Data analysis
Quantitative data were subsequently analyzed using SPSS version 26.0. Each variable was converted into dichotomous data and computed using a t-test for mean difference scores, chi-square for bivariate analysis, and multivariate analysis of variances (MANOVA) for multivariate analysis. Each interview session was recorded, and audio recordings were transcribed verbatim. The data were initially screened for errors and missing inputs. Then they were inductively transformed through descriptive and in-vivo coding based on the interviewees’ languages. Consistency was ensured by utilizing an Excel codebook and cross-checks. Afterward, thematic analysis was performed to capture the common topics and categorization. Themes were confirmed with interviewees and HIV and public health experts in regards to interpretations and salience.

3. Results and discussion
3.1. Demographics of survey participants
Through consecutive sampling at the community health-center, 81 respondents consenting to the study were recruited. Distribution of gender was relatively equivalent, with 49.4% being female. 61.7% of the participants were between 26 to 45 years of age; all respondents received formal schooling with about 66.7% of them graduated from high school. Detailed data on the respondents are in Table 1.

| Variable          | Category            | N   | Percentage (%) |
|-------------------|---------------------|-----|----------------|
| Gender            | Male                | 41  | 50.6           |
|                   | Female              | 40  | 49.4           |
| Age               | 18-25               | 19  | 23.5           |
|                   | 26-45               | 50  | 61.7           |
|                   | 46-64               | 11  | 13.6           |
|                   | ≥65                 | 1   | 1.2            |
|                   | Elementary          | 4   | 4.9            |
| Education         | Junior Highschool   | 10  | 12.3           |
|                   | Highschool          | 54  | 66.7           |
|                   | Higher Education    | 13  | 16.0           |
| Total Respondents |                     | 81  | 100            |
3.2. HIV knowledge questionnaire

All respondents were asked to answer independently the HIV knowledge questionnaire about 18 statements. More than half of the respondents, 55.6%, scored low with a mean score of 8.20±0.26, compared to the high scorers averaging 12.72±0.32 (See Table 2). There is a significant difference in scores between the two groups, with a mean difference of 4.52±0.40 (95% CI 3.72-5.32), \( p \leq 0.001 \). 51.1% of those who scored low and 54.4% scoring high were aged 26-45 years old. Stratified by education level, either low or high scorers most were high school graduates, 68.9% and 63.9% consecutively. Age was significantly correlated to differences in HIV knowledge scores. Post-hoc analysis[21] displayed that age group 25-45 and 46-64 contributed to the significance.

### Table 2. HIV knowledge distribution and score

| Variables | HIV Knowledge | MD±SE | 95% CI |
|-----------|---------------|-------|--------|
|           | Low | High | MD±SE | 95% CI |
| MS±SE     |     |      | 4.52±0.40*** | 3.72-5.32 |
| N (%)     |     |      |       |        |
| Total     | 45 (55.6) | 36 (44.4) |       |        |
| Gender    |       |       | \( \chi^2 \) | p-value |
| Male      | 22 (48.9) | 19 (52.8) | 0.121 | 0.728 |
| Female    | 23 (51.1) | 17 (47.2) |       |        |
| Age       |       |       | \( \chi^2 \) | p-value |
| 18-25     | 10 (22.2) | 9 (25.0) | 11.515 | 0.009⁹ |
| 26-45     | 23 (51.1)⁸ | 27 (54.0)³ |       |        |
| 46-64     | 11 (24.4)³ | 0 (0) |       |        |
| >65       | 1 (2.2) | 0 (0) |       |        |
| Education |       |       | 7.449 | 0.059 |
| Elementary | 3 (6.7) | 0 (0) |       |        |
| Junior high | 7 (15.6) | 3 (3.7) |       |        |
| High school | 31 (68.9) | 23 (63.9) |       |        |
| Higher education | 4 (8.9) | 10 (27.8) |       |        |

Notes: SE, standard of error; MS, mean score; MD, mean score difference; CI, confidence of interval; ⁸ p<0.05 ⁹ p≤ 0.01 ³ p≤ 0.001

3.3. Stigma Questionnaire

Subsequently, the respondents filed the stigma questionnaire which contained three variables each with seven statements. Out of 81 respondents, 21 had high instrumental stigma with an average score of 17.43±0.47, 16 respondents (18.00±0.44) with high symbolic stigma and 14 respondents (17.79±0.66) had high civility stigma. Data are shown in Table 3. The mean score difference for instrumental, symbolic and civility stigma are 6.50±0.50 (95% CI 5.50-7.50) \( p<0.001 \), 7.37±0.59 (95% CI 6.19-8.55) \( p<0.001 \), and 7.85±0.68 (95% CI 6.49-9.20) \( p<0.001 \), respectively. All three sub-scales of stigma were not correlated to age or education level. The majority of high stigma subjects were aged 25-46 and high school graduates.
Table 3. Instrumental, Symbolic and Civility Stigma’s Score and Distribution.

| Variable       | Instrumental Stigma | Symbolic Stigma | Civility Stigma |
|----------------|---------------------|-----------------|-----------------|
|                | Low                 | High            | MD±SE           | Low            | High            | MD±SE           | Low            | High            | MD±SE           |
|                | 10.93±0.25          | 17.43±0.47      | 6.50±0.5        | 10.63±0.27     | 18.00±0.44      | 7.37±0.5        | 9.94±0.28      | 17.79±0.66      | 7.85±0.68       |
|                | N (%)               | N (%)           | χ²              | N (%)          | N (%)           | χ²              | N (%)          | N (%)           | χ²              |
| Total          | 60 (74.1)           | 21 (25.9)       |                 | 65 (80.2)      | 16 (19.8)       |                 | 67 (82.7)      | 14 (17.3)       |                 |
| Gender         |                     |                 | 0.035           | 1.37           | 0.035           |                 |                 |                 |                 |
| Male           | 30 (50.0)           | 11 (52.4)       |                 | 35 (53.8)      | 6 (37.5)        |                 | 30 (50.0)      | 11 (52.4)       |                 |
| Female         | 30 (50.0)           | 10 (47.6)       |                 | 30 (46.2)      | 10 (62.5)       |                 | 30 (50.0)      | 10 (47.6)       |                 |
| Age            |                     |                 | 2.10            | 6.55           | 1.08            |                 |                 |                 |                 |
| 18-25          | 16 (26.7)           | 3 (14.3)        |                 | 19 (29.2)      | 0 (0)           |                 | 17 (25.4)      | 2 (14.3)        |                 |
| 26-45          | 36 (60.0)           | 14 (66.7)       |                 | 37 (56.9)      | 13 (81.3)       |                 | 40 (59.7)      | 10 (71.4)       |                 |
| 46-64          | 7 (11.7)            | 4 (19.0)        |                 | 8 (12.3)       | 3 (18.8)        |                 | 9 (13.4)       | 2 (14.3)        |                 |
| >65            | 1 (1.7)             | 0 (0)           |                 | 1 (1.5)        | 0 (0)           |                 | 1 (1.5)        | 0 (0)           |                 |
| Education      |                     |                 | 3.30            | 7.22           | 5.89            |                 |                 |                 |                 |
| Elementary     | 1 (1.7)             | 2 (9.5)         |                 | 1 (1.5)        | 2 (12.5)        |                 | 2 (3.0)        | 1 (7.1)         |                 |
3.4. Relationship of HIV Knowledge and Stigma Towards PLWHA

Among 36 respondents with high instrumental stigma towards PLHA, 86% had low HIV knowledge; among the low instrumental stigma levels, about 36% had high HIV knowledge. Correlation value between HIV knowledge and instrumental stigma towards PLHA was $\phi_c = 0.246$ with $OR = 0.292$ (95% CI 0.095-0.900), $p=0.027$ (Refer to Table 4). Symbolic and civility stigma had no statistically significant relationship with HIV Knowledge. Multivariate analysis through MANOVA supportively displayed the statistically significant relationship between HIV knowledge and stigma.

### Table 4. The relationship between HIV knowledge and stigma towards PLHA.

| Stigma Variable | HIV Knowledge | $\chi^2$ | $\phi_c$ | OR (95% CI) |
|-----------------|---------------|---------|---------|-------------|
| Instrumental    |               |         |         |             |
| High            | 5 (13.9)      | 31 (86.1) | 4.89* | 0.246 | 0.292 (0.095-0.900) |
| Low             | 16 (35.6)     | 29 (64.4) |         |         |             |
| Symbolic        |               |         |         |             |
| High            | 5 (13.9)      | 31 (86.1) | 1.41  | 0.132 | 0.499 (0.156-1.596) |
| Low             | 11 (24.4)     | 34 (75.6) |         |         |             |
| Civility        |               |         |         |             |
| High            | 5 (13.9)      | 31 (86.1) | 0.52  | 0.08  | 0.645 (0.195-2.129) |
| Low             | 9 (20.0)      | 36 (80.0) |         |         |             |

Wilk's Lambda: 0.887*  
$F = 3.258$  
Hypothetical dF: 3  
Error dF: 77  
Partial $p^2$: 0.113

Notes:  
$\chi^2$, Chi-squared value; $\phi_c$, Phi and Cramer's V; $OR$, Odds Ratio; CI, the confidence of interval;  
* $p<0.05$

3.5. PLWHA and health professionals interviews

The duration of interviews ranged from 25-55 minutes. Details of the interview subjects are outlined in Table 5. The responses were categorized either as “Internal” or “External” factors depending on the affinity of the variables (Shown in Table 6). Within internal factors, fear and denial of HIV and the consequences of stigma were the most reported. Among the five risk groups interviewees, only one
respondent had witnessed discrimination due to HIV. Other internal factors included minimal knowledge on HIV and healthcare services provided. On the other hand, externally reported issues were negative media portrayal and incongruent operational hours of testing services.

Table 5. Characteristics of PLWHA risk groups and healthcare professionals.

| Alias | Age (Years old) | Occupation         | Education | Risk Group | Work Experience (Years) |
|-------|-----------------|--------------------|-----------|------------|-------------------------|
| W001  | 26              | Administration Clerk | Diploma   | TB         |                         |
| W002  | 32              | Housewife          | Highschool | Pregnant   |                         |
| W003  | 24              | Teacher            | Bachelor  | STI        |                         |
| W004  | 31              | Housewife          | Highschool | Pregnant   |                         |
| W005  | 29              | Clerk              | Highschool | MSM        |                         |
| W006  | 40              | Doctor             | Bachelor  |            | 10                      |
| W007  | 32              | Doctor             | Bachelor  |            | 7                       |
| W008  | 30              | Nurse and Councillor | Bachelor  |            | 4                       |

Notes: TB, Tuberculosis; STI, Sexually Transmitted Infection; MSM, Male sex with Male.

Table 6. Qualitative analysis of combined interviews on factors affecting screening access.

| Category                          | Themes                                                                 | Keywords                                                                 |
|-----------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Lack of knowledge regarding HIV   | “That time I had yet to understand the issue, I did not understand about HIV.” - W002 |                                                                          |
|                                  | “I did not read much so I was not in the know about sexual transmitted infection, the risks, how it’s transmitted, or just how to contract it.” - W003 |                                                                          |
|                                  | “The people here generally still have poor knowledge on HIV” – W006      |                                                                          |
| Lack of knowledge regarding testing services | “I didn’t know that there is a specific screening program during that time.” - W001 |                                                                          |
|                                  | “I did talk to my partner about HIV testing; however, we did not know how to access the service or even where they provide it.” - W005 |                                                                          |
| Internal                          | “I denied the possibility at first, I thought it was impossible. Since, HIV positives were not accepted by their family, parents” - W001 |                                                                          |
|                                  | “At first, I felt healthy, so I just try not to think about it. HIV is a very frightening and people think negatively about it.” - W002 |                                                                          |
| Denial and/or fear of contracting HIV and its implications | “I thought I was sick but did not want to admit it was HIV. I feared about family or colleagues’ discrimination when the found out about my status” - W003 |                                                                          |
|                                  | “We knew we (MSM) need to be tested, but we were scared about the consequences if the result is positive. I was scared if later I would be discriminated by family and friends” - W005 |                                                                          |
3.6. Discussion

HIV knowledge was generally low in this study’s samples, 55.6%, the mean difference scores between the two groups were significant. The lowest scores were on aspects of transmission, preventions, and common misconceptions. These results were concordant with prior studies among Indonesian adolescents and women demonstrating that 80% had low HIV knowledge; besides, even health professionals scored only 65-68% on a similar test. These data are contradictory, at a glimpse, to the National Basic Health Survey (NBHS) in Indonesia which reported above 90% of the population had knowledge of HIV, perhaps the consequence of rudimental question, i.e., having heard about HIV/AIDS. HIV knowledge should not be measured based exclusively on awareness, recognition of transmission routes, comorbidities, proper mitigations, testing/screening, and available management provided a more comprehensive picture of knowledge and by itself confirmed awareness.[22,23] Additionally, adequate knowledge spurs health-promoting behavior and disease prevention.[24]

The HIV knowledge score was significantly related to age, especially group age 46-64, in which all respondents were low scorers. Additionally, it was not correlated to gender and education level, in contrast with another study that found a high score group was more likely in the higher educated subjects.[25] This Indonesia pattern could be partly explained due to the low sexual and HIV education considered taboo within formal schooling. Senior citizens receive less exposure to formal teachings on HIV. Such topics are taught minimally and covered the biologic aspect exclusively without contextualizing to life knowledge.[26] Knowledge of HIV has been demonstrated to elevate voluntary counseling and testing (VCT),[27,28] protected sexual practices and lower misconceptions and stigma towards HIV/AIDS.

Two-thirds of Europe and Asia’s countries reported stigma and discrimination towards crucial populations of HIV/AIDS as the critical hurdle to prevention programs and HIV testing. This study analyzed three domains of stigma; firstly, instrumental stigma symbolizes society’s opinions as a reflection of fear on infectiousness characteristics and the deadliness of HIV/AIDS. Over a quarter of the samples in this study had irrational apprehension about HIV/AIDS transmission. Secondly, symbolic stigma represents beliefs, morals, political values, and norms that affect people’s reactions towards activities and groups at higher risk of contracting HIV/AIDS. Lastly, civility stigma portends a form of social justice or punishment against PLWHAs and key populations. High symbolic and civility stigma was found in nearly 20% of the respondent. The former implicates the community still maintained several beliefs such as PLWHAs are immoral humans, should be confined within their community. Their disease is a punishment for their wrongdoing. The latter suggests a sizable portion of the Kemayoran society deemed discrimination and a priori judgments towards PLWHAs as reasonable, e.g., PLWHAs should be dismissed from their jobs. They and their families must not hold public figures positions. Interestingly, higher education participants had the same high proportions as those with only elementary schooling, sharing a similar trend with HIV/AIDS knowledge. Notably, these results implied that individuals might develop stigma due to religious values, political ideals, and norms despite having
sufficient knowledge. However, the similarity of the percentage between stigma should denote possible overlap. Strategies for addressing stigma should consider these numerous factors and physical education alone is inadequate.[29]

Understandably, HIV/AIDS knowledge had strong correlations solely with instrumental stigma with $\phi = 0.246$, $>0.15$ represents a strong association and $>0.25$ influential association.[30] Multivariate analysis also reinforced a statistically significant relationship between HIV knowledge and stigma. The common understanding of the contagion of HIV resulted in the unsound fear towards it. It turned the discrimination towards not only the disease but also the patients and high-risk groups. Similarly Qian et al. discovered that respondents with high HIV infection misconception score higher on discrimination against PLWHAs.[31] 2017 Indonesian NBHS demonstrated that stigma and discrimination were apparent in 83-87% women and 84-89% men. Matching numbers were in groups of elementary graduates and non-schooled groups.[5] The taboo notions and angst towards HIV/AIDS are shared across the archipelago. Certain regions in Java were rejecting to bury PLWHAs within their area.[32] This is a repeating lamentable result of insufficient knowledge and a lack of insight to better understand the disease.[8,33] Other developing countries experience relatable conditions. Studies from Iran, Nigeria, and China exhibited highly stigmatized individuals and limited access to education and healthcare.[34–36]; besides, enduring discrimination was more liable for high-risk behavior. Barriers towards healthcare access were explored through in-depth interviews with the subject from key populations. The major themes were categorized into internal and external drivers, each having three sub-themes. A more significant proportion denoted denial and fear of HIV stigma within internal factors as a barrier to access HIV testing, for instance, a respondent from the MSM population:

“We knew we (MSMs) need to be tested, but we were scared about the consequences if the result is positive. I was scared if later I would be discriminated by family and friends” - W005

Subsequently, this was expressed by others who were perceived to practice high-risk sexual behavior, such as PLWHAs from TB and pregnant key population:

“I denied the possibility at first. I thought it was impossible. Since, HIV positives were not accepted by their family, parents” - W001

“At first, I felt healthy, so I just try not to think about it. HIV is a very frightening and people think negatively about it.” - W002

Several studies[37–39] have highlighted the strong susceptibility of at-risk populations to stigma, i.e. MSM, IVDU and sex workers. However this study proposed that this complication extends to even other key populations such as pregnant mothers and TB and STI patients from accessing healthcare. Other respondents admit the paucity of their HIV knowledge, extending to the healthcare services provided, which was reinforced by a healthcare providers testament:

“The people here generally still have poor knowledge on HIV” – W006

Externally, only one respondent had witnessed discrimination:

“I witnessed a friend who was positive being discriminated by our colleagues. He was gossiped and shunned. I was scared if that would happen to me too.” - W005

Connoting, some might perceive the possibility of stigma due to portrayals in media or the prejudiced tendencies within daily lives and shared ideas from parents, peers, or communities. Another probability is self-imposed discrimination, in which an individual supposed potential discrimination and repudiation due to the attached stereotype from being HIV positive.[40] Healthcare provisions and access are basic human rights regardless of the persons, public sentiments in which PLWHAs should be grateful for receiving free healthcare and medicines[3] must be abolished. Raising HIV/AIDS awareness within vulnerable and broader populations through social media and real-life platforms, should be concentrated.[41] More crucially, acceleration of social and regulatory reforms is direly needed, changing the societal blame, fear, stigma, and discrimination by engaging positive public figures, local and religious leaders, and encouraging home/community-based testing as well as upholding PLWHAs and high-risk groups rights, particularly among healthcare workers.[37] The Indonesian government should play an active and key role in investing in community-level interventions and lay providers to implement a wide and accommodating coverage of testing and screening towards key populations, adopting WHO/UNAIDS new strategies on testing[42] learning from experiences of successful countries such as Thailand.[43,44]
The limited cross-sectional design prohibited causalities from being inferred, and the relatively low number of subjects reduced the power of interpretation on a broader basis. However, the present study integrated quantitative and qualitative measures to understand better the rooted stigma and poor HIV knowledge as the potential barrier to vulnerable populations in accessing HIV testing on the community-level in Indonesia’s capital.

4. Conclusion
Knowledge of HIV/AIDS remains concerning at the community level in the Indonesian capital despite various educational efforts. This correlated to the higher stigma among the South Jakartans population as well. Qualitatively, internal factors such as self-stigmatization and externally the punitive societal environment were quoted as barriers for key populations accessing services. We have shown a high knowledge level could reduce instrumental stigma; however, to reduce other facets of stigma, a joint effort with public and religious figures and spearheaded by the government should be conducted.

Acknowledgements
The authors would like to thank the Kemayoran community health center, especially Mr. Erwin, for collaboration in collecting data in this study.

References
[1] Pusat Data dan Informasi Departemen Kesehatan RI 2006 Status HIV/AIDS di Indonesia tahun 1987-2006 (Jakarta) p 64
[2] UNAIDS [cited 2020 Mar 12] Indonesia [Internet] Available from: https://www.unaids.org/en/regionscountries/countries/indonesia
[3] UNAIDS 2019 Global AIDS update 2019 (Geneva)
[4] Mesquita F, Winarso I, Atmosukarto II, Eka B, Nevendorff L, Rahmah A, Handoyo P, Anastasia P and Angela R 2007 Public health the leading force of the Indonesian response to the HIV/AIDS crisis among people who inject drugs Harm Reduct. J. 17;4 p 9
[5] Kementerian Kesehatan, USAID, Badan Pusat Statistik and Badan Kependudukan dan Keluarga Berencana Nasional 2018 Survey demografi dan kesehatan Indonesia 2017 (Jakarta)
[6] Parut AA 2016 Hubungan pengetahuan tentang HIV/AIDS dengan stigma terhadap ODHA pada siswa kelas XI SMK VI Surabaya J. Ners Lentera 4(2) pp 106–13
[7] Sosodoro O, Emilia O and Wahyuni B 2009 Hubungan pengetahuan tentang HIV/AIDS dengan stigma orang dengan HIV/AIDS di kalangan pelajar SMA Ber. Kedokt. Masy. 25(4)
[8] Waluyo A, Culbert GJ, Levy J and Norr KF 2015 Understanding HIV-related stigma among Indonesian nurses J. Assoc. Nurses AIDS Care 26(1) pp 69–80
[9] Harapan H, Feramuhawan S, Kurniawan H, Anwar S, Andalas Mohd and Hossain MB 2013 HIV-related stigma and discrimination: a study of health care workers in Banda Aceh, Indonesia. Med J. Indones. 1;22
[10] Goffman E 2009 Stigma: notes on the management of spoiled identity Simon and Schuster p 164
[11] Herek GM 1999 AIDS and stigma Am. Behav. Sci. 42(7) pp 1106–16
[12] Siregar N 2012 Pengaruh stigma orang dengan HIV/AIDS (ODHA) terhadap penerimaan masyarakat Desa Buntu Bedimbar di Kecamatan Tanjung Morawa Kabupaten Deli Serdang (Medan: Universitas Sumatera Utara)
[13] Global Network of People Living with HIV (GNP+) 2015 [cited 2020 Mar 12] The people living with HIV stigma index People Living with HIV Stigma Index Available from: https://www.stigmaindex.org/
[14] Charan J and Biswas T 2013 How to calculate sample size for different study designs in medical research Indian J. Psychol. Med. 35(2) p 121
[15] Carey MP and Schroder KEE 2002 Development and psychometric evaluation of the brief HIV knowledge questionnaire AIDS Educ. Prev. Off Publ. Int. Soc. AIDS Educ. 14(2) pp 172–82
[16] Kombu Y 2012 Analisis faktor-faktor yang mempengaruhi tindakan pencegahan penularan HIV oleh ODHA di Sorong (Jakarta: Universitas Indonesia)
Benayoun S, Sondey J, Rojas CD, Morel S, Agusti C, Lorente N, Chamos S, Cigan B, Fuertes R, Pichon F, Fernández-López L, Perelman J and Kaye PS 2017 Euro HIV EDAT project WP8: access to HIV testing and linkage to care for migrant populations in Europe: results of the qualitative study [Internet] European Union p 70 Available from: https://www.researchgate.net/publication/320853588_Euro_HIV_EDAT_Project_WP8_ACCESS_TO_HIV_TESTING_AND_LINKAGE_TO_CARE_FOR_MIGRANT_POPULATIONS_IN_EUROPE_RESULTS_OF_THE_QUALITATIVE_STUDY_Leader_AIDES_France

Kiplagat J and Huschke S 2018 HIV testing and counselling experiences: a qualitative study of older adults living with HIV in Western Kenya BMC Geriatr; 18(1) p 257

Bofill LM, Lopez M, Dorigo A, Bordato A, Lucas M, Cabanillas GF, Sued O, Cahn P, Cassetti I, Weiss S and Jones D 2014 Patient–provider perceptions on engagement in HIV care in Argentina AIDS Care 26(5) pp 602–7

Wisconsin Department of Health Services 2016 Wisconsin HIV needs assessment qualitative report: findings from client and key informant interviews (Wisconsin: Wisconsin Department of Health Services, Division of Public Health) p 63 Report No.: P-01221

Beasley TM and Schumacker RE 1995 Multiple regression approach to analyzing contingency tables: post hoc and planned comparison procedures J. Exp. Educ. 64(1) pp 79–93

Ugarte WJ, Högberg U, Valladares E and Essén B 2013 Assessing knowledge, attitudes, and behaviors related to HIV and AIDS in Nicaragua: a community-level perspective Sex Reprod. Healthc. 4(1) pp 37–44

Burke HM, Fleming PJ and Guest G 2014 Assessment of the psychometric properties of HIV knowledge items across five countries AIDS Educ. Prev. Off. Publ. Int. Soc. AIDS Educ. 26(6) pp 577–87

Glanz K, Rimer BK and Viswanath K 2008 Health behavior and health education: theory, research, and practice (John Wiley & Sons)

Yaya S, Bishwajit G, Danhoudo G, Shah V and Ekholuenetale M 2016 Trends and determinants of HIV/AIDS knowledge among women in Bangladesh BMC Public Health 16(1) p 812

Pakasi DT and Kartikawati R 2013 Between needs and taboos: sexuality and reproductive health education for high school students [Internet] Makara J Health Res 17(2) Available from: http://journal.ui.ac.id/index.php/health/article/view/3030

Gao X, Wu Y, Zhang Y, Zhang N, Tang J, Qiu J, Lin X and Du Y 2012 Effectiveness of school-based education on HIV/AIDS knowledge, attitude, and behavior among secondary school students in Wuhan, China PLoS One 7(9)e44881

Sohn A and Cho B 2012 Knowledge, attitudes, and sexual behaviors in HIV/AIDS and predictors affecting condom use among men who have sex with men in South Korea Osong Public Health Res. Perspect 3(3) pp 156–64

Parker R and Aggleton P 2003 HIV and AIDS-related stigma and discrimination: a conceptual framework and implications for action Soc. Sci. Med. 1982 57(1) pp 13–24

Akoglu H 2018 User’s guide to correlation coefficients Turk. J. Emerg. Med. 18(3) pp 91–3

Qian H-Z, Wang N, Dong S, Chen H, Zhang Y, Chamot E, Shi X, Gao J, Vermund SH and Shao Y 2007 Association of misconceptions about HIV transmission and discriminatory attitudes in rural China AIDS Care 19(10) pp 1283–7

Shaluhiyah Z, Musthofa SB and Widjanarko B 2015 Stigma masyarakat terhadap orang dengan HIV/AIDS Kesmas Natsl. Public Health J. 9(4) p 333

Januraga PP, Mooney-Somers J and Ward PR 2014 Newcomers in a hazardous environment: a qualitative inquiry into sex worker vulnerability to HIV in Bali, Indonesia BMC Public Health 14(1) p 832

Seyedaligahi S, Paydary K, Kazerooni PA, Hosseini M, Sedaghat A, Emamzadeh-Fard S and Mohraz M 2013 Evaluation of stigma index among people living with HIV/AIDS (PLWHA) in six cities in Iran [Internet] Thritra Available from: http://thritajournal.com/en/articles/18175.html

Li Z, Morano JP, Khoshnood K, Hsieh E and Sheng Y 2018 HIV-related stigma among people living with HIV/AIDS in rural Central China BMC Health Serv. Res. 18(1) p 453
[36] Dahlui M, Azahar N, Bulgiba A, Zaki R, Oche OM, Adekunjo FO and Chinna K 2015 HIV/AIDS related stigma and discrimination against PLWHA in Nigerian population *PLoS One* **10**(12)

[37] Tran BX, Phan HT, Latkin CA, Nguyen HLT, Hoang CL, Ho CSH and Ho RCM 2019 Understanding global HIV stigma and discrimination: are contextual factors sufficiently studied? (GAP RESEARCH) *Int. J. Environ. Res. Public Health* **16**(11)

[38] Thapa S, Hannes K, Cargo M, Buve A, Peters S, Dauphin S and Mathei C 2018 Stigma reduction in relation to HIV test uptake in low- and middle-income countries: a realist review *BMC Public Health* **18**(1) p 1277

[39] Rueda S, Mitra S, Chen S, Gogolishvili D, Globerman J, Chambers L, Wilson M, Logie C, Shi Q, Morassaei S and Rourke S 2016 Examining the associations between HIV-related stigma and health outcomes in people living with HIV/AIDS: a series of meta-analyses *BMJ Open* **6**(7)e011453

[40] Mahajan AP, Sayles JN, Patel VA, Remien RH, Ortiz D, Szekeres G and Coates TJ 2008 Stigma in the HIV/AIDS epidemic: a review of the literature and recommendations for the way forward *AIDS* **22**(Suppl 2) S57–65

[41] UNAIDS 2019 HIV prevention 2020 road map (UN)

[42] World Health Organization & UNAIDS 2017 WHO/UNAIDS Statement on HIV testing services: new opportunities and ongoing challenges (Geneva, Switzerland: WHO/UNAIDS)

[43] Muccini C, Crowell TA, Kroon E, Sacdalan C, Ramautarsing R, Seekaw P, Phanuphak P, Ananworanich J, Colby DJ and Phanuphak N 2019 Leveraging early HIV diagnosis and treatment in Thailand to conduct HIV cure research *AIDS Res. Ther*. **16**(1) p 25

[44] Wongkanya R, Pankam T, Wolf S, Pattanachaiwit S, Jantarapakde J, Pengnongyang S, Thapwong P, Udomjirarichot A, Churattananakraisri Y, Prawepray N, Paksoonsit A, Sitthipau T, Petchaitong S, Jitsakulehaidejit R, Nookhai S, Lertpiriyasuwat C, Ongwandee S, Phanuphak P and Phanuphal N 2018 HIV rapid diagnostic testing by lay providers in a key population-led health service programme in Thailand *J. Virus Erad.* **4**(1) p 12–5