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## RESEARCH ARTICLE

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# HIV testing uptake among pregnant women attending private midwife clinics: challenges of scaling up universal HIV testing at the private sectors in Indonesia

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**Summary**

**Introduction:** Being ranked seventh among countries with the highest number of new pediatric HIV infection, around 3% of new pediatric HIV infection worldwide occurs in Indonesia. UNAIDS has set a goal of elimination of mother-to-child HIV transmission, and private sector plays a critical role in achieving this goal. More than half of pregnant women in Indonesia seek antenatal care (ANC) services at private sectors, particularly at private midwife clinics. However, no published data is available on the rates of HIV testing uptake among pregnant women at these clinics, reflecting important gap on prevention of mother to child HIV transmission programmatic data.

**Purpose:** A longitudinal study was conducted to examine the rates of HIV testing uptake among pregnant women attending private midwife clinics in Bali and were referred to Voluntary HIV counselling and testing (VCT) clinics for a HIV test.

**Methods:** Seventy midwives from private clinics were asked to suggest women, who were deemed to be at risk of HIV, to seek HIV testing at the nominated VCT clinics and to provide the women with a referral. Data were then

analyzed to identify the percentage of women who took HIV testing at the VCT clinics among those referred by the midwives.

**Results:** The midwives referred 619 women to VCT clinics. Of the referred women, only 321 (52%; 95% CI, 47.8%-55.9%) took a HIV test at the appointed clinics. Among these who tested, three (0.9%) were HIV positive. This study identified a challenge in scaling up HIV testing coverage among women seeking ANC services at private sectors. Implications and recommendations are discussed.

#### KEYWORDS

HIV testing, antenatal HIV screening, PMTCT, private sectors, Indonesia

## 1 | INTRODUCTION

Indonesia ranks seventh among countries with the highest number of new pediatric HIV infection, with an estimate that around 3% of new pediatric HIV infection worldwide occurs in Indonesia.<sup>1</sup> Among the 10 376 HIV cases reported to the Ministry of Health in the first trimester of 2018 alone, 2.5% were among those aged 4 years old or younger.<sup>2</sup> Despite the scaling up of HIV testing among pregnant women in Indonesia, among 12 000 pregnant women living with HIV in Indonesia in 2017,<sup>3</sup> only 25% of these were aware of their positive HIV status.<sup>4</sup> This is in contrast with the 95-95-95 UNAIDS global target by 2030, which the first 95 refers to that 95% of those living with HIV know their HIV status.<sup>5</sup>

Pregnant women are considered as one of the prioritized group for HIV testing.<sup>6</sup> UNAIDS's Start Free, Stay Free, AIDS Free initiative aims to close the remaining HIV prevention and treatment gap for children and expectant mothers. It sets a goal to end pediatric AIDS, one target of which is that every child should be born and remain HIV free (start free).<sup>7</sup> The response to this commitment has been the Indonesian Health Minister's Regulation no. 52 of 2017 on the Elimination of Mother to Child Transmission of HIV, Syphilis and Hepatitis B Infection,<sup>8</sup> which includes scaling up provision of HIV screening at antenatal care (ANC) services. Despite this regulation, recent data shows that only 10% of pregnant women in Indonesia were HIV tested.<sup>1</sup>

Private sector plays a critical role in achieving the UNAIDS's goal.<sup>9</sup> In Indonesia, one of the private sectors contributes significantly to primary health care services at the community is private midwives. The unique position of private midwives in Indonesia has been acknowledged, particularly in their paramount role in providing a front-line ANC for pregnant women in Indonesia. There is a high preference for private midwife clinics for ANC services. With estimated 5.3 million pregnancies every year,<sup>1</sup> more than 52% of pregnant women in Indonesia seek ANC services at private midwife clinics, with the rest use other health facilities such as puskesmas (16.6%), posyandu (10%), poskesdes (6%), private obstetrician/general practitioner (GP) clinics (4.3%), hospitals (10%), and others (0.6%).<sup>10</sup>

Unlike puskesmas, almost none of the private midwife clinics have in-house provision for HIV testing, so HIV testing cannot be conducted onsite. One of the strategies which is currently practiced, is that if the midwives at these private clinics are concerned with women's risk to HIV transmission, one way for them to get the women HIV tested is to refer the women to voluntary HIV counselling and testing (VCT) clinics. To date, however, there

is no published evidence identifying the rate and predictors of HIV testing uptake among women who present for ANC services at private midwife clinics and are referred to a VCT clinic. A longitudinal study was carried out in Bali to fill this gap.

## 2 | METHODS

Yayasan Kerti Praja (YKP), one of several nongovernmental organizations in Bali that work to prevent HIV in Indonesia,<sup>11</sup> conducted a Prevention of Mother to Child HIV Transmission (PMTCT) project to increase HIV awareness and participation of private midwives in referring pregnant women at risk of HIV to VCT clinics for testing. The project was conducted from June to December 2010 and involved 70 midwives from Badung and Denpasar, and the study was nested in this project. Badung and Denpasar were chosen because they comprised the first and second largest cumulative number of HIV/AIDS cases reported to the Bali Health Office. The 70 selected midwives at these districts met the criteria of servicing at least 10 women per day who sought ANC at their clinic, and opted to participate in the project, and women who sought ANC care at these clinics were approached to participate in the study.

In this PMTCT project, YKP trained the participating midwives with general knowledge of HIV and PMTCT, how to assess HIV risk among their clients, how to provide information on HIV and PMTCT to their clients, and how to suggest to the women that they visit one of five appointed VCT clinics for HIV testing. The midwives were also trained in how to conduct a brief risk assessment interview in a professional, nonjudgmental manner. Following this training, they were asked to provide information on HIV, VCT, and PMTCT to their clients and to undertake a risk assessment with the women, using a questionnaire that identified basic sociodemographic and risk behavior characteristics. The midwives were then asked to suggest that women, who are deemed to be at risk of HIV from the interview, to seek HIV testing at VCT clinics and to provide the women with a referral that contained some sociodemographic data and a code that could be linked to the data they had gathered from the interview session. Women were to take their referral with them to the nominated VCT clinics. At the end of the project, a PMTCT project officer collected the questionnaires used by the private midwives and the referrals handed in at the VCT clinics.

Data from this project was analyzed to examine the characteristics of the women referred by the midwives, the percentage of women who took HIV testing at the VCT clinics among those referred by the midwives, and predictors of HIV testing uptake. The main outcome variable of this study was the uptake of HIV testing, ie, the percentage of women who sought an HIV test among those who were referred by midwives during the project period. Descriptive analysis was conducted using medians for continuous variables and frequencies for categorical variables, followed by bivariate and multivariate analysis to identify predictors of HIV testing.

Sociodemographic characteristics and psychological factors were included in the analysis of predictors of HIV testing. These included sociodemographic characteristics that have been proven in other studies or are thought to be associated with HIV testing among pregnant women, such as age,<sup>12</sup> education,<sup>13,14</sup> number of children,<sup>12</sup> income,<sup>14</sup> area of residence,<sup>13,14</sup> employment, trimester of pregnancy, and distance to a VCT clinic and psychological characteristics as they are explained by the health belief model.<sup>15</sup> The model states that perceived risk/susceptibility, perceived severity of the disease, perceived benefits, and the perceived cost of seeking health will predict whether someone will follow a health strategy. Using this framework, the variables included were whether the woman had heard of HIV, knew someone with HIV, thought HIV was harmful, thought she was vulnerable to transmission, and thought HIV could be transmitted to her baby.

Bivariate analysis using logistic regression was conducted, with a *P* value of less than .05 considered to be significant and included in the multivariate analysis. Multivariate analysis with backward multivariable logistic regression was also conducted, with a *P* value of less than .05 considered significant. The STROBE guidelines were used to guide the reporting of the results.<sup>16</sup>

This study was approved by the Institutional Review Board of the University of Udayana/Sanglah General Hospital.

**TABLE 1** Sociodemographic characteristics and the perceived risk of HIV among study participants

Variables	N	%
Area of living		
Denpasar	445	71.89
Badung	174	28.11
Age (median [IQR])	27	23-30
Origin		
Bali	474	76.70
Non-Bali	144	23.30
Trimester of pregnancy		
First	146	24.09
Second	255	42.08
Third	205	33.83
Education		
Junior high school or below	274	45.29
Senior high school or above	331	54.71
Income		
Less than IDR 1 million	144	34.04
IDR 1 million or above	279	65.96
Number of children		
0	298	48.30
1 or above	199	51.7
Heard anything of HIV		
No	398	64.51
Yes	219	35.49
Knew anyone with HIV		
No	583	94.18
Yes	36	5.82
Perceived HIV as harmful		
No	397	64.14
Yes	222	35.86
Perceived herself to be at risk of HIV		
No	529	85.46
Yes	90	14.54
Thought that HIV could be transmitted from mother to baby during pregnancy		
No	403	65.11
Yes	216	34.89

Abbreviation: IQR, interquartile range.

### 3 | RESULTS

During the project period, midwives referred 619 pregnant women to VCT clinics. The majority of the pregnant women (71.9%) came from Denpasar, their ages ranging from 15 to 41 with a median of 27 (interquartile range



**TABLE 2** Bivariate and multivariate analysis of predictors of HIV testing uptake

		HIV Testing Uptake		Bivariate Analysis		Multivariate Analysis	
Variables	Total	n	%	OR (95% CI)	P Value	OR (95% CI)	P Value
Area of living							
Denpasar	445	214	48.09				
Badung	174	107	61.49	1.72 (1.21-2.46)	.003	1.72 (1.21-2.46)	.003
Age				1.08 (0.92-1.26)	.36		
Pregnancy trimester							
First trimester	146	63	43.15				
Second and third trimester	460	246	53.48	1.51 (1.04-2.20)	.03	1.44 (0.98-2.10)	.06
Origin							
Bali	474	242	51.05				
Non-Bali	144	78	54.17	1.13 (0.78-1.64)	.51		
Education							
Junior high school or below	274	146	53.28				
Senior high school or above	331	171	51.66	0.94 (0.68-1.30)	.69		
Monthly income							
Less than IDR 1 million	144	79	54.86				
IDR 1 million or above	279	144	51.61	0.88 (0.59-1.31)	.53		
Number of children							
0	298	163	54.70				
1 or above	319	157	49.22	0.80 (0.58-1.10)	.17		
Heard anything of HIV							
No	398	213	53.52				
Yes	219	106	48.40	0.81 (0.59-1.13)	.22		
Knew anyone with HIV							
No	583	307	52.66				
Yes	36	14	38.89	0.57 (0.29-1.14)	.11		
Perceived HIV as harmful							
No	397	209	52.64				
Yes	222	112	50.45	0.92 (0.66-1.27)	.60		
Perceived herself to be at risk of HIV							
No	529	272	51.42				
Yes	90	49	54.44	1.13 (0.72-1.77)	.60		
Thought that HIV could be transmitted from mother to baby during pregnancy							
No	403	212	52.61				
Yes	216	109	50.46	0.92 (0.66-1.28)	.61		

Bold text represents statistical significance at the  $p < 0.05$  level.

[IQR] 7 years). Almost half (42.1%) of the women were in their second trimester and said they had no previous children (48.3%). More than half (54.71%) had a top education level of senior high school or above and monthly income of IDR 1 million (US \$100) or above (65.96%). More than half (64.5%) said they had never heard of HIV, mentioned

that HIV was not harmful (64.1%), and said HIV could not be transmitted from mother to baby during pregnancy (65.1%). The majority (85.5%) thought they were not at risk of HIV infection (Table 1).

Among the women referred by the midwives, 321 (52%; 95% CI, 47.8%-55.9%) took an HIV test at the appointed VCT clinics. Among those who were tested, three (0.9%) were HIV positive.

The bivariate analysis showed that area of residence and pregnancy trimester were the only two characteristics that were statistically significant in regard to HIV testing uptake. In the multivariate analysis, only area of residence was still statistically significant. Women who lived in Badung were more likely to take up HIV testing than women who lived in Denpasar. (OR: 1.7; 95% CI, 1.2-2.5;  $P$  value = .003) (Table 2).

## 4 | DISCUSSION

Private sector plays a critical role in expanding HIV testing.<sup>9</sup> With more than half of all pregnant women in Indonesia seek ANC services at private midwife clinics,<sup>10</sup> expanding HIV testing opportunities to these women provides an improved chance to meet the UNAIDS 95-95-95 targets<sup>7,17</sup> and its goal to end pediatric AIDS.<sup>18</sup> In Indonesian context, given that HIV testing cannot be conducted onsite, if midwives at private clinics are concerned with women's risk to HIV transmission, one way for them to get the women HIV tested is to refer the women to VCT clinics. However, no data is available on how much of those referred to the VCT clinics were actually take the test. To our knowledge, this is the first published longitudinal study on rates of HIV testing uptake among women presenting at private midwife clinics in Indonesia. Given limited data available on PMTCT in private sectors,<sup>1</sup> this study fills a huge gap in data on PMTCT services in private sectors in Indonesia. Our study found that following referral, only half of these women underwent an HIV test, and area of residence was associated with the uptake of testing.

Despite the intensive training provided to private midwives, only about 50% of the women referred by midwives to VCT clinics underwent an HIV test. This highlights a challenge to achieving the UNAIDS 95-95-95 targets<sup>19</sup> while HIV testing is not available onsite at private clinics. Offering HIV tests at different facilities, as opposed to onsite, introduces inconvenience in terms of time and distance for women who might want to be tested.<sup>20</sup>

The introduction of point of care HIV testing<sup>21</sup> or that which can be taken at a time and place convenient to the client, such as self-testing,<sup>6,22</sup> is therefore worthy of consideration. HIV self-testing is a practical testing strategy that has been used increasingly to screen high-risk populations. It is notable for its high impact, practicality, and acceptability among clients.<sup>23</sup> The WHO has formally recommended HIV self-testing as a means of reaching those who might be reluctant to seek HIV testing at VCT facilities; and it can be offered by lay workers.<sup>22</sup> The use of lay workers to distribute self-testing kits onsite has yielded high acceptability, as shown in a study of pregnant women in rural India.<sup>24</sup> Given the WHO recommendation, as well as the practicality and high acceptability of HIV self-testing, the potential acceptability of HIV self-testing distributed by lay workers, or in this case private midwives, to pregnant women in the current setting is worth exploring.

The only predictor of HIV testing uptake identified by this study was area of residence. Women who lived in Badung were more likely to undergo an HIV test than women who lived in Denpasar. This association might arise because the Badung area involved in the project is more rural than Denpasar. In rural areas, midwives typically provide front-line services to women,<sup>25</sup> not only for ANC but for other health issues. The good relationship between women and midwives might positively affect their decision to take up HIV testing.<sup>26</sup> The influence of relationship factors on HIV testing behavior might be more critical given the stigma of HIV in this setting, as several studies in Indonesia noted a significant level of stigma in HIV care facilities.<sup>27-29</sup> In Badung district, it may be the case that trust has been built between mother and midwife over a long period, making it relatively easy for midwives to encourage women to be HIV tested, even though they need to visit a different facility and despite the stigma surrounding HIV. In the absence of trust and good rapport between woman and midwife, midwives or other health workers might find it hard to refer pregnant women to HIV testing at other facilities, particularly given the stigma associated with HIV.<sup>30</sup>

Such complexities—the need of a good, trusting relationship between provider and client, and the stigma surrounding HIV—and the practicality of HIV self-testing strategy that can be distributed even by lay workers again suggest that it might be worth exploring HIV self-testing acceptability among pregnant women distributed through private midwives clinics. This is emphasized by a recent study that points to the high acceptability of the onsite self-testing strategy in the current setting and an improvement in testing rates even when lay workers distributed the tests to clients they knew only during the study period.<sup>31</sup> The other advantage of the use of HIV self-testing has also been that it might also increase couple testing rates at antenatal setting.<sup>32</sup>

Caution should, however, be taken when interpreting these results. Although the midwives were trained in how to conduct an interview during the project, bias might yet have slipped through; some questions were considered sensitive, and women might have been reluctant to provide true answers. The timeframe in which pregnant women were expected to visit a VCT clinic might also have been too short; perhaps the pregnant women visited a VCT clinic for testing after the project period and this was not recorded. Perhaps, too, the number of nominated VCT clinics was too limited; among the 40 VCT clinics available in those two districts,<sup>33</sup> only five were appointed for involvement in the project. Besides these reservations, many women might be more likely to seek HIV testing in facilities that were not included in this project for other reasons. Finally, the profiles of pregnant women who seek ANC services at 70 midwives involve in this project might differ from those of other women who seek ANC at other private midwife clinics and who did not participate in this project.

## 5 | CONCLUSIONS

This study noted a low coverage of HIV testing among pregnant women who were approached in private midwife clinics where HIV testing is not available onsite. The rates were lower among women who lived in urban areas than those who lived in rural areas. It is therefore concluded that, first, despite significant numbers of pregnant women seek ANC services at private sector, there is a huge challenge on PMTCT program in this sector in Indonesia. Second, referring women to other health facilities for HIV testing creates difficulties, which might partly due to stigma around HIV. The introduction of a point of care testing strategy that enables midwives to screen their clients for HIV onsite is therefore worth trialing. HIV self-testing, as recommended by the WHO, is one of the point of care testing strategies that could reach those who are reluctant to seek testing at VCT clinics; its high acceptability has been proven, making it a strategy worthy of future consideration.

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