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Cost Analysis of Mobile Voluntary Counseling and Testing among Female Sex Workers in Bandung, Indonesia

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Abstract

Background The prevalence of HIV among female sex workers (FSW) in Indonesia is still increasing. One of the main intervention to reduce the sexual transmission of HIV, is voluntary counseling and testing (VCT). However, the current coverage of VCT among FSW remains low. Mobile VCT holds potential to reach more FSW, because it improves the physical accessibility. However, no data on costs of mobile VCT is known in Indonesia. It is of great interest for health policy makers to know these costs for their decision- making on HIV/AIDS interventions.

Objective To determine the costs of mobile voluntary counselling and testing (VCT) service delivery among FSW in Bandung, Indonesia in 2015, and therewith inform the local AIDS commission.

Methods Data on utilization and costs of mobile VCT among FSW was collected in a STI-clinic in Bandung for the period of January 2015-December 2015. The costs, from a societal perspective, were estimated using a micro-costing approach.

Results In 2015 the clinic tested 407 FSW, resulting in 25 new HIV cases, during their mobile VCT activities. The unit cost per FSW tested by the intervention was US$7.27. The total costs made in the analyzed period were US$2,985. The personnel costs formed the biggest cost component (79%) with US$2,344.

Conclusion The unit costs per FSW tested by mobile VCT were lower compared to the unit costs of clinic-based VCT. Therefore, it seems that mobile VCT has great potential to implement at larger scale. Before mobile VCT can be up-scaled, it is important to further determine the effects and to perform a cost-effectiveness analysis.

Key words: Cost Analysis, Mobile Voluntary Counseling and Testing, Female Sex Workers, HIV/AIDS, Indonesia

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Introduction

Indonesia faces a concentrated epidemic with a prevalence of 660,000 people living with HIV/AIDS in 2014 (1). It is especially concentrated among high risk groups such as female sex workers (FSW), injecting drug users (IDUs), and men having sex with men (MSM), except in Papua where the epidemic is generalized. The estimated prevalence in Indonesia among the general population is low (0.4%).

While a decline in HIV prevalence is noticed among IDUs, the epidemic is still growing among FSW and their clients. The most important mode of transmission of HIV has shifted from injecting drug use to sexual transmission. Studies suggest that targeting high risk groups, such as FSW, is an effective way to prevent further HIV transmission (2, 3). In 2011 the HIV prevalence in Indonesia among direct FSW was 10% and among indirect FSW 3% (4). Direct FSW are women who sell sex, in brothels or street-based, as a main source of income. Indirect FSW are working in karaoke bars, massage salons or spas (5).

FSW play a key role in the spread of HIV in Indonesia. To stop the spread of this growing epidemic there is need for HIV/AIDS interventions that are effective in reducing the sexual transmission among FSW (1).

Indonesia's national response to HIV/AIDS is guided by the National Aids Commission (NAC). The goals of this response are to prevent and reduce risk of the HIV transmission, to reduce the social and economic impact of HIV and, to improve the quality of life of people who are HIV positive (1). NAC recommends numerous of interventions, especially for high risk groups, such as: condom distribution, harm reduction program and, voluntary counseling and testing (VCT) (6).

Voluntary counseling and testing of HIV (VCT) is one of the key components in fighting HIV/AIDS in Indonesia. Promoting and improving FSW's access to VCT is an important tool to prevent further HIV transmission. VCT functions as an entry point for care and treatment. In addition, VCT will also prevent further spread of HIV by reducing the risk behavior of the FSW (7).

Female sex workers live and work in an environment characterized by vulnerability, stigmatization, exploitation, and gender inequity. Hereby the FSW's access and use of regular VCT services is challenging (8, 9). Current coverage of services is still low and the prevalence among FSW remains high. By the end of 2009, only 27.8% of the FSW had received a HIV test in the last 12 months and were aware of the results, and 23.94% of the FSW were reached with HIV prevention programs (6). These percentages are far below the targets that has been set by UNAIDS in 2014. The targets include that in 2020 90% of all people living with HIV know their HIV status, of these people diagnosed with HIV 90% will receive antiretroviral therapy (ART) and 90% of all people receiving ART will have viral suppression (10). It is important that in the near future more FSW will be reached with VCT.

Tromp et al. showed that scaling up community-based VCT in West-Java is very cost-effective compared to hospital-based VCT. Community-based is defined as providing services at close distance to the living or working area of the target group, in public community health centers. Implementation of this intervention raises some concerns. Scaling up community-based VCT requires an increase of community health centers that can deliver VCT, resulting in costs of US$1.3 to US$3.8 million per year (11). It is not sure if the implementation of scaling up community-based VCT is feasible because of these costs. Hence, there is need for an effective

intervention which provides lower costs. A study of Siregar et al. examined the costs of upscaling VCT at four different sites in Bandung. The results showed that the STI community clinic could play an important role in the uptake of VCT. The success of this clinic is probably a result of the mobile activities (12). These mobile activities improve the physical accessibility and reduce the structural barrier related to the fear of recognizing and stigmatization (8, 13, 14).

Studies in Africa evaluated a mobile approach. In these studies, home-based VCT was provided by several mobile teams who systematically visited every home offering HIV counseling and testing (15, 16). The results of these studies showed that home-based VCT is more cost-effective compared to clinic based VCT. Tabana et al. reported lower average costs per client for home-based VCT compared to the clinic, US$29 and US$38 respectively (15). Mulogo et al. confirmed these results, their study reports that home-based VCT strategy is more effective at diagnosing HIV individuals and at a lower cost to health service providers, than the facility-based strategy (16). Evidence about the costs of mobile VCT interventions is unavailable in Indonesia. International literature focuses mainly on Africa and is difficult to generalize (17). This study is part of a broader project that will examine priority setting on a larger scale (18). This study focuses on the FSW in Bandung, because the nature of the HIV epidemic is similar in Indonesia (except for Papua) the results of this study can be generalized to a broader scale. Knowing these costs of upscaling mobile VCT is an important input for decision-making (19). The results of this study can be used to inform the Komisi Penanggulangan Aids (KPA) of Bandung about the possibilities and limitations of scaling up mobile VCT in their district.

Against this background, the aim of the study is to evaluate the costs of mobile VCT service delivery among FSW in Bandung. In addition, to inform policy makers in setting priorities for HIV/AIDS interventions.

Methods

Study Setting

The area of analysis is the city Bandung, which has a population of 2.4 million. The study was conducted at the STI community clinic, *Klinik Mawar*, in Bandung. Between January 2015 and January 2016 the clinic distributed both VCT and STI services and the visitors mostly consisted of FSW, transgender, and MSM. The clinic is a non-governmental organization with some funding from different donors. During the study mobile VCT was offered to FSW, who were working in a hotspot (brothel, massage salon, spa or karaoke) in a district in Bandung. Costs were total program costs from the social perspective.

The clinic has its own mobile team which carries both mobile STI service as mobile VCT (HIV testing and counseling). The mobile VCT service delivery consists of pre-counseling, taking the blood sample, testing and post-counseling. The pre-counseling and taking the blood sample are part of the first visit to the hotspot, and the post-counseling is part of the second visit. During the first visit the staff of the mobile team includes a counselor, midwife or nurse, and an administrant. During the pre-counseling the counselor discusses the risks and prevention methods of HIV with the group of FSW. Afterwards the FSW will fill in a registration form and the nurse or midwife will take a blood sample. After this, the blood samples are analyzed in the laboratory of the clinic performed by a laboratory analyst. HIV antibodies will be detected with rapid tests. Somebody is diagnosed HIV-positive when three tests resulted reactive. Post-counseling takes place two days after the first visit. The

staff of the second visit consists only of the counselor. The counselor discusses the results of the HIV test one on one. When the HIV test is reactive the counselor supports help and set up a referral form for the nearest hospital for further treatment. The clinic does not provide any further treatment or medicines for the HIV-positive FSW.

Data Collection and cost estimation

The costs were estimated for a period of twelve months (January to December 2015) and were evaluated based on the methods in the WHO training manual: Cost analysis in primary health care by A. Creese & D. Parker (20). The costs data was obtained in April and May 2016. The costs were first measured in Indonesian rupiah, and afterwards calculated to US$ using the exchange rate of 2015. A micro-costing approach was used to determine the costs.

The costs were distinguished in healthcare costs and non-healthcare costs. The healthcare costs were further divided in capital and recurrent costs. The healthcare costs were estimated on the basis of data on service utilization retrieved from expenditure records and unit costs. Also interviews with the staff of the clinic were conducted to complete the data. The capital costs for mobile VCT included buildings (administration and laboratory) as well as the equipment used in these areas. The costs of the building were based on expenditure records and an allocation was used to determine the building costs for the intervention. The costs of the equipment were based on the expenditure records of the clinic. The costs of the equipment were subsequently annualized over the expected useful life with a 3% discount rate.

The recurrent costs of mobile VCT contained; personnel, supplies, transportation, training and utilities. Personnel costs were calculated based on the monthly salaries and yearly bonuses and percentage hours spent on the mobile VCT for FSW activities. The supplies consumed for the mobile VCT among FSW during the one-year time period of observation were estimated using expenditure records. The supplies consisted of medical and administration goods. The transportation costs were estimated using an expert opinion. The training costs included the location, trainer and other costs and were estimated using expenditure records and an expert opinion. The costs of the utilities (water, electricity, telephone/WIFI, monthly charges and repair costs) were also based on the expenditure records and expert opinion.

The non-healthcare costs, costs on the patient for undergoing the mobile VCT, were based on ten interviews with the female sex workers in different hotspots. The data collected included monthly income and the working schedule. In addition, we obtained information about the effects and perceived quality of the mobile VCT through interviews with the FSW.

Assumptions

Some assumptions are made in this study. First, the administration room and laboratory were not 100% used for the intervention. Therefore, the rent of the building per square meter was multiplied by the total square meters used. It was assumed that the time for performing the administration for the mobile VCT is the same as for other services in the clinic. Based on experience and expert opinion, the average time of analyzing the HIV-tests is five minutes. The time for performing the HIV test and doing the administration was used to calculate a proportion to estimate the costs of the rooms, equipment, and other maintenance costs (water, electricity, telephone/WIFI, monthly charges, and repair costs).

Second, for the supplies were expenditure records of 2015 used. Because the clinic combined some supplies to one amount in their records, we subdivide the supplies

needed for the intervention and calculated the proportion supplies spend. Third, the clinic receives US$1.50 from the Global Fund for each motorcycle per visiting a hotspot. This funding covers the fuel, oil and reparation. The personnel of the clinic use their own vehicle, thereby there is assumed that the funded money also covers the fraction of the costs if a similar motorcycle was bought.

Fourth, due to lack of funding, the amount of trainings given is decreased to a few in the last seven years. The counselor of the mobile VCT team was the only one trained in 2015. To increase the quality of the mobile VCT service delivery it is required that there are more trainings for the whole mobile team available. In the estimations we only included the counselor training, because this represents the accurate costs of the intervention.

Fifth, the productivity loss is estimated on the basis of ten interviews with the FSW. There is assumed that their answers correspond with the actuality. Last, the time needed for post-counseling varies widely between HIV-positive and HIV-negative FSW. Based on experience of visiting three hotspots, there is an average time measured of performing one mobile VCT per FSW, resulting in 30 minutes. This time included the travel time, pre-counseling, taking the blood sample, testing and post-counseling and is been used for calculating the personnel costs.

A sensitivity analysis is performed to examine the robustness of the baseline costs to some main parameter variations. First, we increased the amount of training. To optimize the quality of the intervention we will add an extra mobile VCT training per year of five days for the whole mobile team with a rehearsal training day (Sensitivity 1). Second, we varied the salary of the FSW using a -/+25% approach (Sensitivity 2 and 3). Last, the time for post-counseling will be increased till a maximum of 60 minutes (Sensitivity 4).

Results

A total number of 407 FSW were tested by the mobile VCT team during the one-year period, resulting in 25 positive HIV cases. In 2015 the mobile team had 21 visits in thirteen different hotspots. Some hotspots were visited routinely and others were visited occasionally, this depends on the manager of the hotspot. In total there are around 80 spas, massage salons, and karaoke and one Red Light District (RLD) in Bandung. A RLD consists of several brothels where direct FSW are working. The clinic does not support mobile VCT on every hotspot in Bandung, because in some hotspots they are not allowed to perform HIV testing.

	US$	Proportion of total
Health care Costs		
Capital Costs		
Building	12.90	0.4%
Equipment	14.06	0.5%
Sub-Total	26.96	0.9%
Unit Cost	0.07	
Recurrent Costs		
Personnel	2344.26	79.2%
Supplies	318.34	10.7%
Transport	94.10	3.2%
Training	20.54	0.7%
Other	4.91	0.2%
Sub-Total	2,782	94%
Unit Cost	6.84	
Non Health care costs		
Estimated productivity loss	149.34	5.1%
Unit Cost	0.37	
Total Annual Cost	2,985.45	
No. of FSW tested	407	
Unit Cost	7.27	

Table 1: Costs of mobile VCT among FSW in Bandung from societal perspective

Costs of mobile VCT

The costs of the mobile VCT service among FSW are shown in table 1. From a societal perspective, the annual costs of the intervention were US$2,985, with an unit costs per FSW tested through mobile VCT of US$7.27. The recurrent costs were 94% of the total costs, and the personnel costs constitute the largest cost item (79%). The costs for the clinic, provider perspective, are in total US$1,079 with a unit costs per FSW tested of US$2.65. The interviews with the manager of the clinic revealed that the clinic is not operating at full capacity for the mobile VCT and they are open to cover more hotspots. In addition, the FSW were positive about the mobile VCT and some of them indicated a preference of more often to get tested, especially the indirect FSW.

The variations in the different parameters resulted in small changes of the unit costs, shown in table 2.

	Unit Cost	Total Costs
Baseline	7.27	2,985
Sensitivity 1	7.68	3,126
Sensitivity 2	7.36	2,996
Sensitivity 3	7.18	2,921
Sensitivity 4	7.29	2,967

Table 2: Results of sensitivity analysis in US$. Situation 1=upscale of trainings; Situation 2 and 3= estimated salary FSW varied with relatively +25% and -25%; Situation 4= Time post-counseling 60 minutes

Costs of upscaling mobile VCT

The current coverage of the clinic consists of twelve spas, karaoke, and massage salons, and one RLD. The RLD is already covered so we do not take this hotspot up into the up-scaling calculations. An average of 24 FSW per hotspot is calculated and will be used for further estimations. The current situation consists of 287 indirect FSW tested by the mobile team, in twelve hotspots. Some hotspots were more often visited then other locations. Based on expert opinion from the clinic, it seems feasible to scale up the mobile service delivery to maximum 48 hotspots. In scenario 3, this results in an amount of 1,152 FSW tested, based on an average of 24 FSW per hotspot. In addition, every hotspot will receive the mobile team twice a year for the VCT. This results in a maximum of 2304 indirect and 120 direct FSW tested through mobile VCT in 49 different locations. The total costs of the up-scaling of the intervention for a one-year period will be US$17.461, with a unit cost of FSW tested of US$7.20. As shown in table 3, the unit cost will decrease, especially in the first scenario. The fixed costs consisted of the cost for the building, equipment and the maintenance of the building (other costs). The variable costs included the costs of the personnel, supplies, transport, training, and the estimated productivity loss.

	No. Hotspots		No. Mobile VCT		Total Costs	Unit Costs
	RLD	*Other*	*Direct FSW*	*Indirect FSW*	(USD)	(USD)
Current	1	12	120	287	2,958.45	7,27
Scenario 1	1	24	120	1152	9,178,34	7,22
Scenario 2	1	36	120	1728	13,320.74	7,21
Scenario 3	1	48	120	2304	17,461.95	7,20

Table 3: Upscale scenarios of indirect FSW in Bandung. *Female Sex Workers (FSW), Voluntary counseling and testing (VCT)*

Discussion

This study examined the costs of mobile VCT service delivery, to inform policy makers for their decision-making in priority setting. To our knowledge, this is the first study in Indonesia who estimates the costs of mobile VCT service delivery among FSW. The total costs of the intervention for the one-year period were US$2,958. The capital costs were very low (0,91%) compared to the total costs. This can be explained by the fact that the capital costs consisted of the building and its equipment. As the mobile VCT takes place at hotspots the proportion of building and equipment used is low, one of the main advantages about the intervention. In 2015 there were 407 FSW tested through the mobile VCT service, resulting in 25 new HIV cases among direct and indirect FSW (6.1%). This percentage is in accordance with the prevalence determined in 2011 (4). The unit costs of the intervention were US$7.27 per FSW tested, and these costs varied slight (US$7.18-US$7.68) when some parameters were changed.

The study of A. Siregar, conducted at the same STI community clinic, showed unit costs per clinic-based VCT of US$65 (12). These findings revealed in proportion higher non-health care costs. The unit costs of the mobile VCT are lower than the clinic-based VCT. Although the studies are conducted at the same clinic, we have to take in account that there are some differences. The study of A. Siregar is performed in 2008, the funding of the clinic has changed in the past few years. First, there is nowadays no more funding for trainings of the personnel and therefore the amount of trainings is decreased. Second, the salaries of the personnel are lower than in 2008, also due to lack of funding. The clinic has become more independent in the past few years. The unit costs of the clinic-based VCT are almost nine times more expensive than the mobile VCT. Therefore, it seems that, despite of the changes, the costs of the mobile VCT are lower than the clinic-based VCT and this indicates more feasible possibilities for implementation on larger scale.

Our results should be interpreted with some caution, because the study has some limitations. First, some costs are based on an expert opinion. We assumed that the experts featured about enough knowledge to give an accurate estimation. Second, some FSW indicated that they were more often tested through the clinic then noted in the administration of the clinic. In the estimations the data of the administration is used. Third, there are some assumptions made, described in the section 'Assumptions' of the Methods. The non-health care costs of undergoing the mobile VCT were estimated on the basis of the monthly income and working schedule of ten interviewed FSW. There was a broad range in monthly income of the FSW. It is possible that the salary levels of these FSW do not reflect the income of the average FSW in Indonesia. To our knowledge, no up-to-date data on average monthly income of FSW in Indonesia was available, therefore we examined parameter changes with a -/+25% approach. Further, in the baseline calculations we only included the counselor training, the only training given in the one-year period. More trainings for the whole mobile team will not result in a considerable increase of the unit costs. Last, the post-counseling time of HIV-positive FSW is explored with a maximum of 60 minutes. This resulted in an average time per FSW tested through mobile VCT of 33 minutes. This can be explained by the relative low amount of HIV-positive FSW.

Interviews with the FSW revealed that they prefer the mobile VCT compared to the clinic-based VCT on several reasons. The mobile VCT is more efficient for the FSW because it

increases the psychical accessibility. The FSW can stay at their workplace and through this they save travel costs and time. Further, some FSW indicated that they were afraid of recognition at the clinic, known as a STI-clinic in the environs. Last, the FSW stated that they prefer to be more often tested, especially the indirect FSW. The FSW were overall pleased with the service of the clinic, the information was detailed and the staff was friendly.

Based on our findings, we can make some recommendations. Overall, to reduce further HIV transmission through sexual contact there is need for upscaling the mobile VCT service delivery. Mobile VCT holds great potential to increase at a larger scale. First, the unit costs of mobile VCT were lower than the unit costs of clinic-based VCT (12). Second, our findings of upscaling mobile VCT among indirect FSW in Bandung showed annualized costs of US$17,461 with a unit cost of FSW tested of US$7.20. Tromp et al. already showed that scaling up community clinic-based VCT is very cost-effective compared to hospital-based VCT. However, the costs of upscaling community clinic-based VCT in the province West-Java will be high, between US$1.3 to US$3.8 million per year (11). It is difficult to compare our data with the findings of Tromp et al, due to different areas and other cost components, but our lower unit costs can indicate lower upscaling costs for the province West-Java. Third, the set up costs of mobile VCT are low because it does not require a big building or clinic. The mobile VCT is mostly performed at a hotspot, so the upscaling can mostly be accomplished by hire more personnel. To upscale mobile VCT in other provinces it is possible to set up only a mobile VCT location (laboratory and administration room). Low building costs is one of the main advantages of mobile VCT compared to clinic-based VCT.

However, there are some considerations. For upscaling participation of the hotspots is necessary. In the current situation not all hotspots (mostly spa's, karaoke, and massage salons) are willing to receive the mobile team for VCT. The hotspots are afraid of getting closed when the government is aware of the fact that they deliver sexual services. It is of great interest that the hotspots are informed about the importance of the VCT by the local HIV/AIDS commission.

Second, we have to consider the finances of the clinic. The clinic costs were US$2.65 per FSW tested through mobile VCT. The clinic receives a fee per HIV test from the indirect and direct FSW, respectively US$1.15 and US$3.34. The mobile team tests more indirect FSW than direct FSW. Therefore, the incomes are lower than the expenditures and the clinic has to contribute money for mobile VCT. Nowadays, the clinic makes enough profit of other services to compensate. If we upscale the mobile VCT, the clinic can get some financing problems. It is not wisely to increase the fee of the FSW, because this will decrease the participation. To remain the existence of the clinic in the upscale scenarios, the funding of the clinic has to increase.

In conclusion, this study evaluated the costs of mobile VCT among FSW in Bandung, Indonesia. The unit costs per mobile VCT are lower compared to the clinic-based VCT. Therefore, it seems that mobile VCT holds great potential to implement at larger scale. In addition, the FSW prefer the mobile VCT. Further research on the effectiveness of the mobile VCT is needed to make a considered decision about the priority setting for HIV/AIDS interventions in Bandung. Although this study is specific to Bandung, the conclusions and recommendations could also be relevant to other parts in Indonesia.

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