


There are a limited number of peer reviewed studies on the costs of HIV prevention services in Asia [8-14]. These show that costs vary considerably by setting, finding that the cost of reaching a sex worker ranges from US\$10 to US\$124 (US\$2006) [14-17]. There are many reasons for these differences, foremost of which is scale [15]. However, other factors such as the type of the population reached, programme intensity, age of the programme may also impact costs. For example, a study by Dandona et al in 2008 found that costs of similar HIV prevention interventions fell as scale increased and over time [17].

As a part of the overall evaluation plan, Avahan was subject to an intensive costing effort and an economic evaluation in four southern states, Karnataka, Maharashtra, Andhra Pradesh and Tamil Nadu during 2005-2008. This evaluation covers over eighty districts, and thus provides an opportunity to understand the drivers of HIV prevention costs [18]. This paper presents the costs of delivering Avahan HIV prevention package in two urban settings where distinct typologies of high risk population were targeted in order to explore how the costs vary for different typologies in similar settings.

This study presents the costs of HIV prevention in two large scale urban settings, Mumbai and Thane in

Maharashtra and Bangalore in Karnataka. In Mumbai and Thane, we measured the costs of delivering HIV prevention to different typologies of FSWs, HR-MSM and transgenders. A cross sectional behavioural and biological survey conducted in April 2006 in Maharashtra found an HIV prevalence of 28.1% (22.2-34.8) among brothel-based FSWs and 19.2%(13.7-26.2) among street-based FSWs [19]. In Bangalore, we measured the costs of HIV prevention services to FSWs and HR-MSMs. A study of HR-MSM in Bangalore in-2008 found an HIV prevalence of 18.9% [19]. HIV prevalence among the FSW population in Bangalore was estimated to be 12.6% from routine surveillance [20].

In Mumbai/Thane, Avahan funds 16 separate non-governmental organizations (NGOs) to deliver HIV prevention services. Each of these NGOs targets different high risk populations (Table 1). The estimated population targeted by Avahan in Mumbai and Thane was 34,919 persons. By the end of year three, a total of 51,885 individuals had been reached at least once. The number of individuals reached was higher than the population estimate due to the migration of individuals in and out of the target group. The breakdown of the population reached by Avahan in Mumbai and Thane consisted of: 51% bar-based FSWs, 13% brothel-based FSWs, 16% home-based FSWs, 12% street-based FSWs, 4% HR-

| Sl. No. | Typology | Estimated Population | Individuals Reached |
|--------------|------------------------|----------------------|---------------------|
| 1 | BB | 2000 | 3381 |
| 2 | BG | 2200 | 2772 |
| 3 | BB / BG | 1700 | 2194 |
| 4 | HB / BG | 3000 | 4384 |
| 5 | HR-MSM | 1500 | 2411 |
| 6 | BB / LB / SB / HB / BG | 1500 | 1659 |
| 7 | HIJRA | 1500 | 1125 |
| 8 | BB / HB/ BG | 4057 | 5251 |
| 9 | HB / BG /MSW | 2800 | 3676 |
| 10 | BB / BG | 2671 | 3451 |
| 11 | BB / SB / HB | 1800 | 2751 |
| 12 | BG / MSW | 3052 | 5201 |
| 13 | BB / LB / SB / HB / BG | 2039 | 3646 |
| 14 | HIJRA | 1800 | 1668 |
| 15 | BG / SB | 2000 | 3482 |
| 16 | BB / LB / SB / HB / BG | 1300 | 4833 |
| Total | | 34919 | 51885 |
| 17 | SB | 12743 | 25124 |
| 18 | HR-MSM | 6226 | 11496 |
| Total | | 16 | 6620 |

* (B), (BB), (LB), (HB), (BG) (H -M M).
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target population typology. For example, in Mumbai/Thane on average, by 2008, each brothel-based and bar-based FSW reached was contacted around 4.4-4.8 times per year. Street-based FSWs were contacted less frequently at around 4.2 times per year. In comparison, while intensity was low to begin with, by 2008 home based sex workers were contacted 5.4 times a year. Similarly HR-MSM intensity was low initially, but by 2008 was 5.9 times per year. In Bangalore, the number of contacts per year was found to be about 4.4 times a year for FSWs and 4.9 times a year for HR-MSMs in 2008. By 2008, in Mumbai/Thane, STI clinic visits a year did not vary substantially by population group and the mean was around 1 per year. For Bangalore, the mean frequency of clinic visits per year for HR-MSMs was around 0.47 in 2008. For FSWs it was slightly higher at 0.58 clinic visits per year.

Table 3 presents total programme costs broken down by typology and risk group for all sites in Mumbai, Thane and Bangalore. Broadly, total costs of each programme increased over the years, with the most increase occurring between years 1 and 2. The total economic cost is US\$9.2 million over the three years in Mumbai/Thane. 44% of this cost was spent on interventions focussed on bar based sex workers. The allocation to different target groups (as a proportion of total cost) remained much the same throughout the period, (aside from the cost of reaching home based workers that increased as the programme expanded). The total cost of the programme in Bangalore was around US\$3.1 million. The proportion cost related to HR-MSM, increased over time and reached around 34.4% of the total cost by 2008.

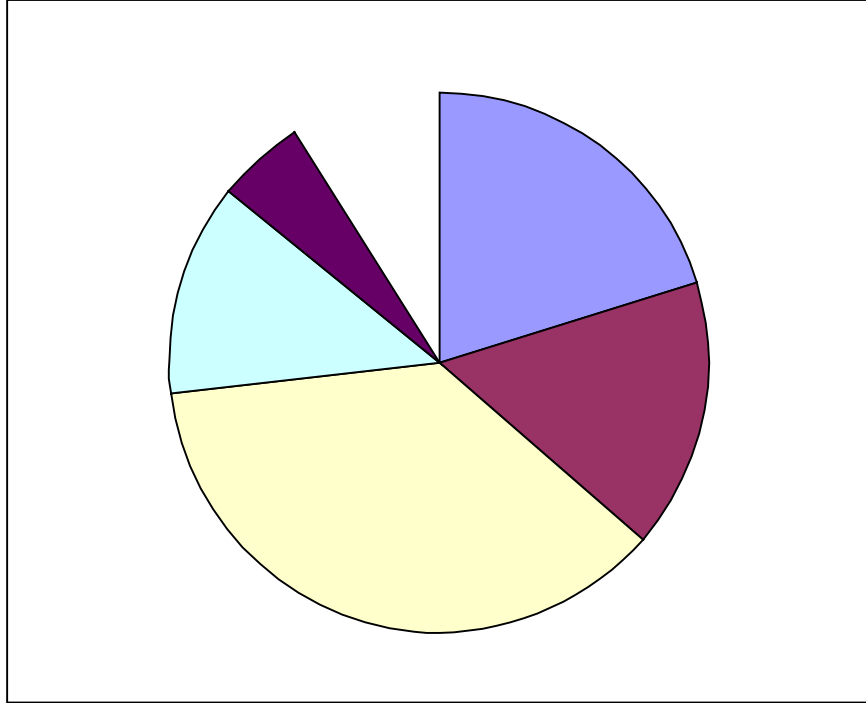
Figure 1 shows cost breakdown by input type across all areas studied. Capital costs account for around 13%

of total cost. Personnel costs account for 39% of cost, followed by STI supplies costs at 16%. Figure 2 shows the breakdown in terms of activities. Programme administration costs (including mapping, programme monitoring and management information system, start-up activities, management staff, office expenses and overheads) account for around 37% of total costs, followed by outreach at 20%, STI services at 16% and, community mobilisation and advocacy activities at 13%. Start up activities contributed around 5% of the total costs.

The unit costs by typology (estimates made from detailed costing sites/ or single target population sites only) are shown in Table 4. By year 3, the unit costs of reaching a member of the targeted population ranged from \$US 75 to \$US 116 in Mumbai and Thane and \$US 37 to US\$ 42 in Bangalore. Costs for non-fixed location groups (Hijras, street- based FSWs and HR-MSMs) tended to be higher than those for operating from a fixed setting (brothel and bar- based FSWs). Table 4 also shows that costs per person reached decline over time for brothel and bar based workers in Mumbai and Thane and in all target populations in Bangalore, but not for other groups. Figure 3 shows the cost breakdown for each typology by input type. For the most part, harder to reach groups (e.g. the non-fixed location groups) have higher capital (including building maintenance) and personal (including training) costs per person reached than groups operating from fixed settings. In terms of breakdowns by activity, harder to reach typologies show a similar proportional breakdown of

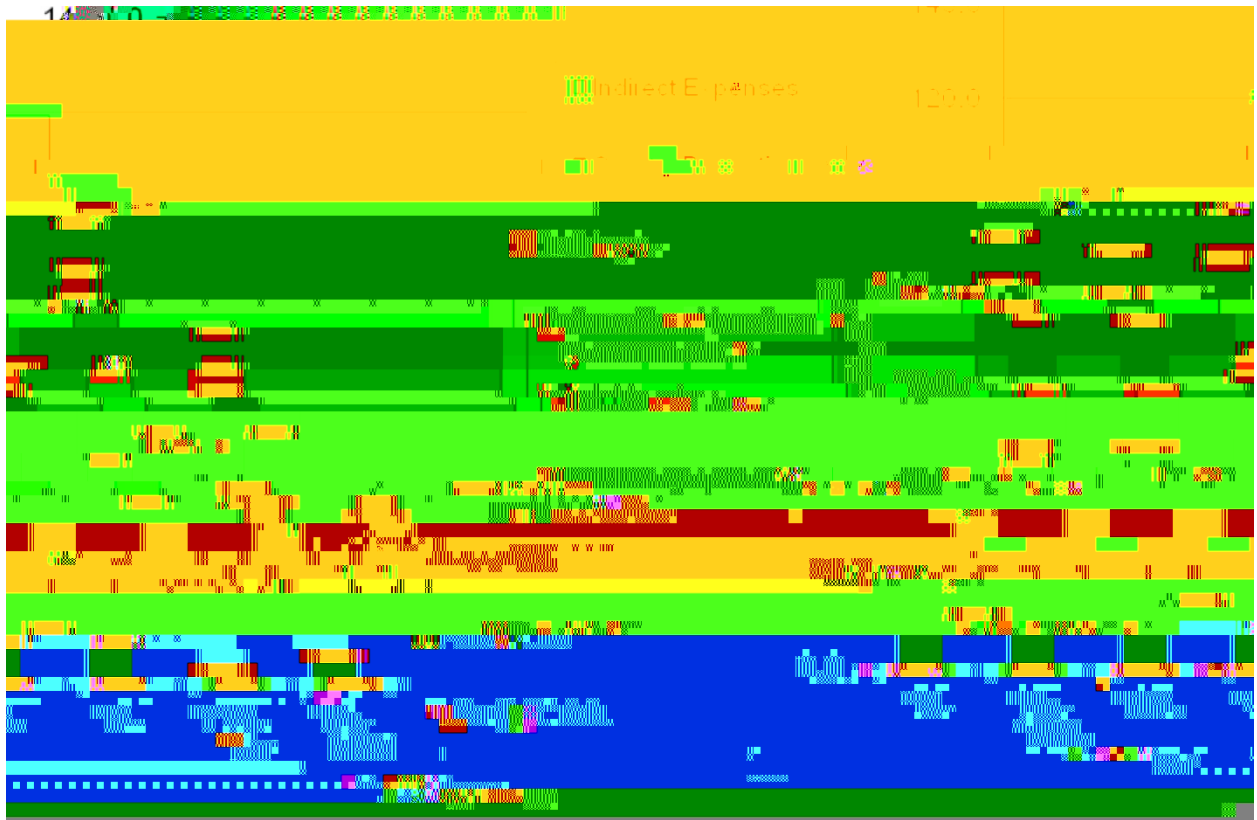
inputs as fixed location groups (Figure 4). We also analysed the relationship between the numbers of contacts per person reached per year (from Table 2) and the unit cost per person reached (Table 4). Some patterns were observed. For example in year 2 intensity and cost follow the same trends. However both in year 1 and 3 this association is weaker. Overall we found a correlation coefficient ($r=0.32$), but this was not found to be statistically significant.

There is considerable interest by the Government of India, and other countries to sustain HIV prevention



are at the higher end of those found in previous studies in India of both Avahan and HIV prevention delivered by others [11,14-17]. This is likely to be due to the package of services included and the fact that our costs also include expenditures beyond the NGO level, which most previous studies omit. However, broadly our findings suggest that sex worker populations who operate

from non-fixed locations are likely to cost more. For example, in Mumbai/ Thane, the cost of reaching hijras is approximately 1.5 times the cost of reaching the lowest cost group (bar girls). In Bangalore, we find that the cost of reaching HR-MSMs is with marginally higher than that of reaching FSWs. This is somewhat different than the findings of the one previous study from India



▶ Economic unit costs of detailed NGO costing sites in Mumbai/Thane and Bangalore by input and typology US\$2008 (3% discount rate).



that reports on the costs of reaching these two groups in the same setting [11]. This found that the mean costs of the HR-MSM programme and reaching FSWs in Andhra Pradesh were, respectively, US\$7.8 and US\$32.1 (US\$2006) per person reached. The reasons for this difference are hard to ascertain without a detailed understanding of what was included in the HR-MSM cost in that study.

The factors that drive cost differences between high-risk population groups are complex. As with between settings, unit cost variation within similar settings is likely to be related to the size of the target group. This is demonstrated by the decreases in unit costs over time as the programme expanded (Table 4). Moreover, in any one year, larger populations groups, such as bar girls, have lower costs (Table 4). In the few instances where this pattern cannot be observed, the explanation was found to be due to site-specific issues. For example, NGOs changed condom supplier over the years, and this increased costs over time. This scale effect may also explain the difference in costs between reaching FSWs and HR-MSMs in Bangalore, given that the FSW population is more than twice the size of the MSM population. These finding mirrors those from earlier studies by Dandona et al (2008) [17] and Chandrashekar et al (2010) [17].

The scale effect within NGO sites for different target groups is also illustrated by our cost breakdowns. Our cost breakdowns show that the proportion of both capital and personnel related costs are substantially higher per person reached in smaller target groups whereas other costs such as those for STI supplies (as a proportion of unit costs) remain more uniform across different target groups. This is likely to be due, in part, to the fact that each NGO needs a certain level of fixed capacity in key areas, such as support and supervision for outreach workers. Planners and funders therefore need to consider whether it is worth encouraging NGOs targeting smaller groups to share these fixed costs between one another, and explore how their funding mechanisms can better encourage the more efficient use of fixed resources.

Our data also suggest that higher intensity of service, in terms of numbers of contacts made, is associated with higher unit cost per person reached, albeit in a very limited way. In Mumbai/ Thane the magnitude of the difference in intensity (ranging from 4.2 to 6.6 contacts per year) is aligned to magnitude of the cost differences observed, with the exception of street-based FSWs, particularly in year 2. In year three there were specific issues with the management of the Hirja programme that meant that costs remained high, despite a lower intensity of effort. In Bangalore however, this is much less the case, as differences in intensity are much

lower, and thus overall we found no statistically significant relationship between intensity and cost. More work needs to be done with large sample sizes to explore this relationship further.

We observe little variation in the proportion of activity costs between different population groups. This indicates that no group required a special mix of activities, but nevertheless, when asked to interpret our findings programme staff identified some specific issues when

the place of residence. The issue of frequent raids in brothels also affected programme services in certain areas. Again this limits the robustness of results, even though most of the above effects were temporary in nature.

Our findings suggest that policy makers, planners and analysts should consider the typology of the target population when conducting efficiency analyses and setting budgets across HIV prevention programmes. Analytically, care should be taken to judge costs and efficiency in the context of the populations they service. However, setting budgets using a fixed amount per person reached risks penalising those NGOs who are targeting more difficult to reach groups and may create a perverse incentive to focus on high risk groups that cost less to reach.

Different HIV prevention target groups present multiple issues in delivery of services and interventions, reflected in the cost variation. Policy makers and programme managers are therefore recommended to examine the particular circumstances of the populations being reached when setting budgetary limits for HIV prevention services for high risk groups.

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