



Original Research Article

## Mapping and Size Estimation of Hijras and Other Trans-Women in 17 States of India: First Level Findings

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### ABSTRACT

**Background:** For effective planning, implementation and evaluation of targeted HIV interventions among trans-women, a large-scale study on mapping and size estimation of diverse subgroups of trans-women (including hijras) was conducted in 17 States of India.

**Methods:** The study was conducted between December 2012 and September 2013. We used geographical community mapping approach and conducted interviews with community and non-community key informants to identify the sites frequented by trans-women (TW) and to estimate their surveyed numbers at those sites. Ten percent of the districts from each of the 17 States of India and a sub-sample of the mapped sites were randomly selected and visited for validation involving trans-community representatives at all levels.

**Findings:** A total of 5821 sites were identified in the 17 Study states: 1664 (28.6%) in rural areas and 4157 (71.4%) in urban areas. Top five states reporting the highest number of TW sites, covering 60% of all sites, were: Maharashtra, Odisha, Tamil Nadu, Uttar Pradesh and West Bengal. The estimated trans-women population across the 17 states was 62 137 (range: 53 280 – 74 297): 21% in rural and 79% in urban areas. Top five states reporting the highest numbers of trans-women, covering 61% of the estimated population, were: Andhra Pradesh, Maharashtra, Odisha, Uttar Pradesh and West Bengal. Validation of the estimates yielded comparable results.

**Conclusions:** The information on the location of the sites and size estimation of trans-women populations in 17 States in India will help in planning and scaling up HIV prevention interventions and social protection programs in various states of India.

**Key words:** Mapping, Size estimation, Hijras, Trans-women, India.

### INTRODUCTION

Transgender (TG) people have existed in India for centuries. Several indigenous terms-such as hijras, kinnars, aravanis and thirunangai- are used for

transgender or trans-women (born as males but identify themselves as women or third gender), depending on the regions in India in which they reside. <sup>(1,2)</sup> Factors such as discrimination from families and society,

lack of educational and economic opportunities and engagement in sex work, significantly contribute to their vulnerability to HIV infection in India. <sup>(3)</sup>

In its strategic plan of the third phase of National AIDS Control Program <sup>(4)</sup> of India, trans-women have been explicitly described as a key population at-risk for HIV and the need to ‘saturate’ coverage of such key populations by scaling up HIV prevention interventions throughout India <sup>(5)</sup> has been articulated. The urgency of the need for scaling up of HIV prevention interventions among trans-women was further highlighted by recent reports of high HIV prevalence among trans-women across India, with reports of HIV seroprevalence ranging from 8.8% to 16.4% in these populations was estimated during the recent rounds of National HIV serosurveillance. <sup>(4)</sup> The NACP-IV working group on hijras and other trans-women has also emphasized the urgency to scale up HIV interventions. <sup>(6)</sup>

For effective scaling up of HIV prevention interventions for trans-women, it is crucial to have strategic information about where hijras and other trans-women reside and what is their population size? Mapping of the areas where hijras and other trans-women reside, socialize or engage in sex work can help in identifying suitable areas for initiation of HIV prevention interventions, and size estimation can help in allocating adequate resources for such interventions.

The purpose of our study was to build an evidence-base for rapid scale up of HIV prevention / care and social protection programs for hijras and other trans-women. The study objectives were to map the areas where hijras and other trans-women reside or where they can be potentially reached for HIV education outreach (e.g., public places or brothels); and to estimate the population size of hijras and other trans-women at the identified sites in 17 states of India.

## **MATERIALS AND METHODS**

The study was conducted between December 2012 and September 2013 in 17 states of India with the support of UNDP, India, and National AIDS Control Organisation of India. The field work for mapping and size estimation was implemented by a research agency namely, Integrated Marketing Research Bureau (IMRB), with supportive supervision from the research team at the National Institute of Epidemiology (NIE).

**Ethics statement:** The study protocol was approved by the Institutional Human Ethics committee of NIE.

**National and regional consultations to fine-tune strategies for mapping and size estimation:** In January 2012, a national consultation with researchers and research agencies having experience in conducting mapping and size estimation of trans-women and other at-risk populations was organized. Subsequently, three regional consultations with hijras and other trans-women were organized to get community inputs on fine-tuning mapping and size estimation methods and on developing strategies to involve hijras and other trans-women in this study. <sup>(7)</sup>

**Selection of study States:** The 17 study States in India were: Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Kerala, Maharashtra, Manipur, Nagaland, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. As the main purpose of the mapping was to help the ongoing HIV program in India, these 17 states were selected based on certain practical and program-relevant considerations such as: availability of preliminary data (from the trans community and HIV program officials) on the presence of high number of trans-women in the State; estimated density of hijras and other trans-women; preliminary data on HIV risk behaviors and/or HIV

prevalence of trans-women in certain sites; and presence of non-governmental organizations (NGOs) already working with trans-women or deemed capable of implementing targeted HIV interventions for trans-women.

***Methods for mapping and size estimation:***

For size estimation purposes for the HIV program, trans-women were defined as individuals who self-identify themselves as hijra, transgender or any other local/regional variations of these terms to refer to male-to-female transgender people (Shiv-shakthi, Yellamma, Jogappa/Jogta, etc.); and who access 'hot spots' (sites to meet potential sex partners – especially clients of sex work); who are in brothel or brothel-like spaces (e.g., Hamams [bathing places] or massage parlors); or in other accessible places for intervention; and who are in woman attire - full- or part-time.

For social / community mapping, a participatory approach was employed in which information about sites in a particular geographical area was obtained from both trans-community (primary) and non-community (secondary) key informants. Potential key informants were explained that participation in this study was entirely voluntary and no personal identifying information was being collected. Key informants for each area were chosen carefully taking into account their knowledge and experience about the local trans- communities. All sites in a particular location were first listed with the help of key informants and local non-governmental organizations, and then verified by the research teams through field visits to the concerned listed sites.

Estimate of the number of trans-women in a particular listed site was arrived at by identifying trans-community key informants who regularly visited or who were very familiar with that particular site. For each site, usually at least three trans-

community key informants or two trans community key informants and one non-community key informant were interviewed to obtain a range (minimum and maximum) and point estimate of the number of trans-women visiting that site. If the numbers obtained from the key informants differed widely, then wherever possible, a Delphi consensus process <sup>(8)</sup> (a way to build consensus among the key informants to arrive at estimates that are acceptable to all) was used.

All the key informants were explained about the purpose of their involvement, procedure involved, confidentiality of their identity and willingness to be the informant; after obtaining their written informed consent only, the data was collected.

***Field work implementation and validation:***

A total of 204 teams of three members each (Field coordinator, Data Collector and Community liaison) were deployed across the 17 states. For identification of sites and for getting trans-women estimates, approximately 10,912 Key informants were approached of which 7,214 were community key informants and 3,698 were non-community key informants. Representatives from the community were involved at the planning and execution levels.

Validation of the sites identified and estimation of population sizes were conducted by a seven-member research team from the NIE. From each State, 10% of districts were selected and from these districts the number of sites to be visited for validation was arrived at using following criteria: if the minimum number of sites in these districts was more than 10, then 10 sites were selected using simple random sampling; and if the minimum number of sites in the districts was less than 10, then all of them were selected.

NIE team members visited the selected sites along with the State

Community Coordinator or a local trans-community liaison person and approached an independent set of community and non-community key informants to prepare a fresh list of sites and size estimates of trans-women visiting those sites. The fresh list of sites obtained by NIE team was compared with the original list, and site visits were made. The newly reported sites were visited and if found correct, then they were added as new sites and if certain sites were found to be defunct, then they were removed from the list. In addition, the estimated sizes of trans-women in all the listed areas were obtained and compared with the original estimates. If the difference in the estimates for a given site was beyond 10%, then the estimation was repeated with a fresh set of key informants.

## RESULTS

In the 17 study states, a total of 5,821 trans-women sites were mapped, with a total estimate of 62,137 trans-women. The distribution of population sizes of trans-women in all the 17 study States is shown in Fig 1.

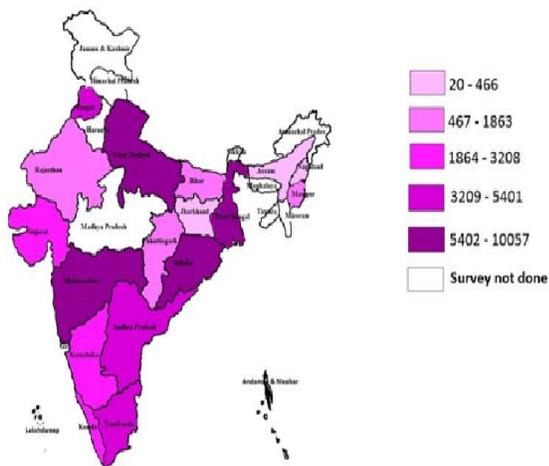


Figure 1: Distribution of Hijras and other trans-women populations in the 17 surveyed states

**Number and nature of sites mapped in the 17 States:** There were 4,157 (71.4%) sites in urban areas, and 1,664 (28.6%) sites in rural areas. Top five states which reported the highest number of sites (3,508), comprising of 60% of all sites, were: Uttar Pradesh (825), West Bengal (752), Odisha (696), Tamil Nadu (649) and Maharashtra (586). The bottom five states that reported the lowest number of sites (314), comprising of 5% of all sites, were: Bihar (118), Assam (91), Manipur (52), Jharkhand (49) and Nagaland (4) - all either in North or Northeast of India. The percentage distribution of number of sites as per their locations in all the study states is depicted in Fig 2. The States differed in the percentage of sites located in urban and rural areas. For example, 6.7% (56.2% within the state) in Odisha were in rural areas and 100% of the sites within the state were in urban areas in Manipur (0.9% overall) and Nagaland (0.1% overall).

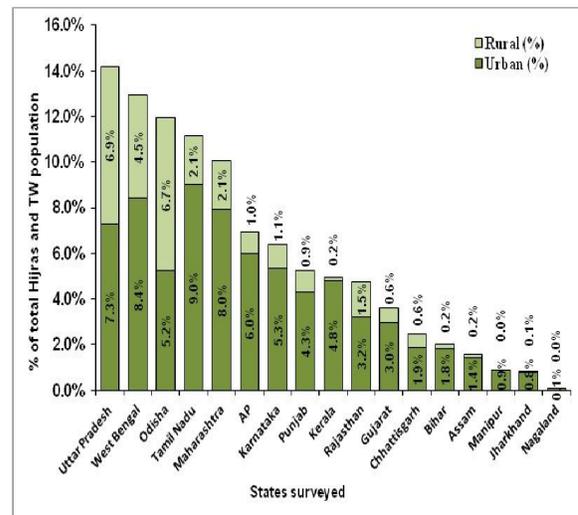


Figure 2: Percentage distribution of location of hijras and other trans-women sites in the 17 surveyed states [Urban: 4,157 (71.4%) Rural: 1,664 (28.6%) Total = 5,821]

The nature and type of sites were quite diverse: railway stations, bus-stops, cinema theatres, public toilets, parks, bridges, subways, truck stops, market

places, bushy areas, abandoned buildings, brothels, hamams (bathing places), beaches and religious places. All these different types of sites were classified into 3 major categories: Public sites, brothels / hamams and 'other sites'. Out of the total 5,821 sites, 2,597 (45%) sites were public sites with a

range of 10.8% (n=75) in Odisha to 95.2% (n=275) in Kerala; 79 (1.4%) were brothels / hamams, ranging from none in 9 states to 14.8% (n=55) in Karnataka; 3,145 (54%) were 'other sites' ranging from 4.8% (n=14) in Kerala to 89.1% (n=620) in Odisha (Table 1).

**Table 1: Hijras and other trans-women sites in the 17 study states**

	Nature of Sites						
	Total Sites	Public sites*		Brothel/Hamam**		Others***	
		N	%	N	%	N	%
Andhra Pradesh	404	307	76.0	4	1.0	93	23.0
Assam	91	57	62.6	0	0.0	34	37.4
Bihar	118	35	29.7	0	0.0	83	70.3
Chhattisgarh	144	57	39.6	0	0.0	87	60.4
Gujarat	209	24	11.5	0	0.0	185	88.5
Jharkhand	49	18	36.7	0	0.0	31	63.3
Karnataka	372	230	61.8	55	14.8	87	23.4
Kerala	289	275	95.2	0	0.0	14	4.8
Manipur	52	49	94.2	0	0.0	3	5.8
Maharashtra	586	394	67.2	9	1.5	183	31.2
Nagaland	4	0	0.0	0	0.0	4	100.0
Odisha	696	75	10.8	1	0.1	620	89.1
Punjab	305	150	49.2	2	0.7	153	50.2
Rajasthan	276	85	30.8	0	0.0	191	69.2
Tamil Nadu	649	265	40.8	0	0.0	384	59.2
Uttar Pradesh	825	102	12.4	3	0.4	720	87.3
West Bengal	752	474	63.0	5	0.7	273	36.3
Total	5821	2597	44.6	79	1.4	3145	54.0

(Less than 10 sites –overall, were not considered for this table)

\* Public sites: Railway Station, Bus-stops, Cinema Theatres, Public Toilets, Parks, Bridges/Subway, Truck parking lots, Markets, Bushy areas, Abandoned buildings, Beach \*\* Hamam: Bathing places \*\*\* Others: Residential places, Places of Guru/Jamat/Dera (Daily gathering) and Religious places

**Table 2: Size estimates of Hijras and other trans-women population in study state location**

	Location of sites								
	Total			Rural			Urban		
	PE	LL**	UL***	PE	LL	UL	PE	LL	UL
Andhra Pradesh	5401	4911	6203	758	704	975	4643	4207	5228
Assam	466	409	472	36	34	40	430	375	432
Bihar	1053	827	1298	160	121	223	893	706	1075
Chhattisgarh	935	817	1051	136	127	155	799	690	896
Gujarat	3058	2669	3439	261	224	294	2797	2445	3145
Jharkhand	385	275	512	25	22	31	360	253	481
Karnataka	2920	1755	4196	300	210	466	2620	1545	3730
Kerala	3208	2658	3452	48	35	50	3160	2623	3402
Manipur	799	697	877	–	–	–	799	697	877
Maharashtra	10 057	8727	11 588	800	692	994	9257	8035	10 594
Nagaland	20	19	21	–	–	–	20	19	21
Odisha	7854	6629	9228	3724	3098	4439	4130	3531	4789
Punjab	4182	3631	4680	438	369	503	3744	3262	4177
Rajasthan	1863	1699	2627	415	379	646	1448	1320	1981
Tamil Nadu	5147	4522	7205	792	726	1092	4355	3796	6113
Uttar Pradesh	8001	6737	9300	3180	2716	3691	4821	4021	5609
West Bengal	6788	6298	8148	2273	2119	2572	4515	4179	5576
Total	62 137	53 280	74 297	13 346	11 576	16 171	48 791	41 704	58 126

\* PE: Point Estimate \*\* LL: Lower Limit \*\*\* UL: Upper Limit

**Table 3: Size Estimates in actual study and validation study: Sites stratified by Quartiles Based on the mean of the estimates of sizes of sites by actual study and validation study**

Stratum by Quartile size (Q1 =4; Q2=7; Q3=13.5)	No of Sites	Actual study estimates	Validation study estimates
Stratum 1 : <Q1 (sites with size≤4)	96	244 (218,270)	262 (236,288)
Stratum 2 : Q1-Q2 (sites with size>4 & ≤7)	81	496 (456,536)	442 (406,478)
Stratum 3: Q2-Q3 (sites with size>7 & ≤13.5)	88	874 (803,945)	889 (813,965)
Stratum 4: >Q3 (sites with size>13.5)	83	2827 (2239,3415)	2872 (2248,3496)
All validated sites	348*	4441 (3704,5178)	4465 (3693,5237)
Q – Quartiles			

\*66 sites (from both actual and validation study) were found “0” as size and were removed.

### Estimated size of trans-women in the 17 States:

The size estimates of trans-women by location and levels of estimations in all the 17 States have been summarized in Table 2. The point estimate of total trans-women population across the 17 States was 62,137 (range: 53,280 to 74,297). The point estimates for trans-women in rural and urban areas were 13,346 (21%) and 48,791 (79%), respectively.

The top five states (with 61% of the total estimates) with the highest estimated number of TG women were Maharashtra (10,057), Uttar Pradesh (8,001), Odisha (7,854), West Bengal (6,788) and Andhra Pradesh (5,401). Similarly, the five states (with 4.9% of the total estimates) with the lowest number of TG women were: Chhattisgarh (935), Manipur (799), Assam (466), Jharkhand (385) and Nagaland (20).

Of all the estimated 62,137 trans-women, 29,097 (47%) were associated with Gharana (‘house’ or clan system of hijras). Among the 17 States, Maharashtra had the highest proportion of trans-women associated with any Gharana (77%, N=7,762 of 10,057) and Bihar had the lowest (13%, n=138 of 1,053). However, in the rural areas, the highest proportion of Gharana-based trans-women was in Karnataka (79%, n=236 of 300) and the lowest was in Bihar (4%, n=7 of 160). In the urban areas, the highest proportion of trans-women was in

Maharashtra (78%, n=7,175) and the lowest was in Bihar (15%, n=131).

### Validation of mapping and size estimation:

Sample of sites that had unacceptably deviant in estimated sizes of trans-women (from the Agency’s size estimate and NIE’s validated figure) was visited again by an independent team of NIE for validation and identifying the reasons for the variations. The migratory nature of the TGs was main reason for the variation in estimates. In some sites MSM were also included in the estimates. In eight sites out of 11, either NIE (n=5) or the Agency (n=3) figure was found to be repeated (presumably correct) Since there was a large number of towns / villages reported as “non-TG / Hijra areas” in the mapping, we did validation visits to some of these areas, to check if actually there were no trans-women / Hijras in them. These validation visits were made for 50% of taluks and 10% of villages in 3 districts of Tamil Nadu and 2 districts of Gujarat.

### The findings of these validation visits have been summarized below:

- Trans-women did not want to get identified with their native villages along with their natural families; instead, with their gharanas.
- Migratory nature of these trans-women was one of the reasons for these differences in the estimates.

- Some trans-women were married to females and have children. They were not to be contacted
- There was confusion of identification of trans-women with Men having sex with Men (MSM) / Kothis.

Since the sizes of the sites varied, we further sub-divided the sites into four groups (strata) using quartiles of the average of size estimates (for each of sampled sites) by Agency and NIE as cut-off values and adopted 'Bland Altman' method to study the agreement between the estimates of both within the subdivided groups. There were 414 sites whose sizes were estimated both by the Agency and NIE. Sixty six of them were reported to have 0 sizes by both teams and were excluded for this analysis. The mean of the estimates of each of the remaining 348 sites by the

Agency and NIE were obtained. These means were stratified into four quarters using quartiles as cut-off points. The details of cut-off values for these quartiles are given in column 1 of Table 3.

There were 96 sites with sizes less than 4 (first quartile; Q1) TGs. The size estimate of these 96, estimated the size to be 262 (95% CI 236, 288); very close agreements in the estimates were noticed. Similar conclusions could be drawn in other three strata as well. The total estimates in all these 348 sites arrived by the Agency was 4,441 (95% CI 3,704, 5,178) and that by the validation team was 4,465 (95% CI 3,693, 5,237). Since the sites selected by the validation team was by random process and the estimates were independent, it can be concluded that the size estimates of the Transgender population of the 17 states by the survey could be closer to the truth.

**The findings of the validation study can be summarized as under:**

- In general the estimates of the Agency were found to be almost correct.

- The variations in estimates were mainly due to migratory nature of this population and the mixing of MSM group.
- Major proportion of this population (as they live in clusters) in a state has got covered in this size estimation exercise.

In general, the estimates from the validation were within the 10% range of the original estimates.

## DISCUSSION

The study estimated 62,137 (range: 53,280 – 74,297) trans-women in 17 States in India: 21% in rural and 79% in urban areas. A total of 5,821 sites were identified in these 17 States: 1,664 (28.6%) in rural areas and 4,157 (71.4%) in urban areas. The top five states that had the highest number of sites (60% of all sites) were: Maharashtra, Odisha, Tamil Nadu, Uttar Pradesh and West Bengal.

This study was probably the single largest mapping and size estimation study on transgender women that had ever been conducted in India or even in the world. We mapped the locations of sites frequented by trans-women and estimated the size of trans-women populations in major urban areas of 17 States in India. We believe that size estimates of trans-women would help the National AIDS Control Program both in allocating resources and in planning scale up initiatives among trans-women. The findings would also guide the social protection programs of the Ministry of Social Justice and Empowerment, which have the mandate to address the social issues of transgender people.

To cross-check our findings, we obtained available disaggregated data on size estimates of trans-women from the State AIDS Control Societies of Maharashtra, Karnataka, and West Bengal, and found that those data were within a

reasonable range of the size estimates from our study, further validating our study findings. In addition, as all the stakeholders - government agencies such as State AIDS Control Societies and non-governmental and community agencies working with MSM and trans- women, and researchers, were involved in all the steps of the study (designing, implementation and getting feedback on the findings), the study findings were well received and owned by the trans community agencies and networks in India.

Social mapping approach is the commonest method reported by several countries in South Asia for size estimation of at-risk groups for HIV. <sup>(9)</sup> In South Asia, only a few peer-reviewed papers have been published on the size estimation of trans-women. One study conducted in Pakistan <sup>(10)</sup> reported an estimate of 39,262 hijra sex workers across 12 major cities and used similar methods (geographical mapping and use of trans- women community key informants). In another study from Pakistan, <sup>(11)</sup> geographical and network mapping methods, essentially a variant of the mapping and size estimation methods that we have described in this study, were used for size estimates of hijra sex workers as part of a second-generation HIV sero-surveillance study. Thus, these two studies from outside India have also focused on hijra sex workers but they have limitations that they were conducted in major cities. Our study moved beyond major cities and involved both urban and rural locations in 17 out of the 29 States in India, thus a much wider and representative area. A few other published studies conducted among MSM and/or female sex workers in countries like Kenya <sup>(12)</sup> and Sri Lanka <sup>(13)</sup> have also reported the use of geographical mapping approach and key informants for size estimation, similar to the methods that we have used in our study, and those studies

have reported that size estimates to be reasonably reliable.

**Limitations and Strengths:** This study has some limitations. First, because we used social/community mapping by involving primarily trans-women key informants, it is possible that we might have missed some sites and could have either over- or underestimated certain subgroups of trans-women (e.g., hijras are usually a visible community but not those trans-women who live with their biological families). Second, the use of nomination method for size estimation of trans-women visiting the mapped sites (instead of actual head counting at sites) means possibility of over- or under-estimation of trans-women in the mapped sites. However, we relied primarily on the local trans- community key informants who were well aware of the sites and we also tried to build consensus among the key informants, to arrive at a possible minimum and maximum number of trans-women visiting the mapped sites. Also, the validation exercise further established the reliability of the estimates. Third, it is possible that some trans-women could be visiting more than one site and thus there is a possibility of double-counting. However, trans- community key informants were of the view that trans- women in sex work usually frequent one particular work site as professional rivalry would prevent them from visiting all the potential sex work sites in a city thereby reducing chances of duplicate counting. Also, in each State we collected data in parallel across multiple sites and hence over or under-estimation due to temporary migration is minimized. Fourth, we did not conduct mapping in each and every city or village in the 17 States but limited the detailed study only to cities or rural areas where some presence of trans-women was reported by key stakeholders. Thus, the estimate provided from this study should not be seen as the total number of

trans- women in the entire geographical areas of the 17 study States. The strengths of this study include involvement of trans-communities and other key stakeholders in finalizing the methodology for mapping and size estimation, participatory social mapping approach and having a robust validation framework.

## CONCLUSIONS

The information on the location of the sites and size estimation of trans- women populations in 17 States in India will help in planning and scaling up HIV prevention interventions and social protection programs by the National AIDS Control Organisation and the Ministry of Social Justice and Empowerment, respectively. In fact, immediately after this mapping exercise, the data were used by NACO in identifying sites for sampling trans women populations for a national integrated biological and behavioral surveillance survey. The present multi-state mapping study involved all key stakeholders – the union government, State AIDS Control Societies (state level government authorities for HIV program), trans community stakeholders and civil society organizations working with sexual and gender minorities, from the beginning of the study to its completion, which helped in ownership and acceptance of the study data. Future research can use a similar process to map and estimate the population size of trans- women in the rest of the Indian States and Union Territories to help planning HIV, health and social protection programs for trans-women.

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