

Rural women's knowledge of AIDS in the higher prevalence states of India: reproductive health and sociocultural correlates

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SUMMARY

This study aimed to identify socio-cultural and reproductive health correlates of knowledge about AIDS among rural women using multivariate analysis of 1998–1999 National Family Health Survey (NFHS) data from two Indian states, Maharashtra and Tamil Nadu, where the urban HIV prevalence is relatively high. Analysis using multiple logistic regression was undertaken, modelling women's knowledge of AIDS, of whether the disease can be avoided, and of effective means of protection. Although 47% of all rural women in Maharashtra were aware of AIDS only about 28% knew that one can avoid it, and only about 16% possessed correct knowledge about its transmission. In Tamil Nadu, where overall 82% of rural women had awareness of AIDS, about 71% knew that one can avoid the disease but only about

31% possessed correct knowledge about its transmission. In both states, women from socially and economically backward groups had lower odds both of having awareness of AIDS and knowledge of ways to avoid getting the disease. Associations with socio-cultural and reproductive variables and the impact of contact with family planning services differed in the two states. The spread of the epidemic to rural areas presents a need actively to disseminate AIDS related knowledge for health protection rather than waiting for knowledge to follow the appearance of the disease in communities. Approaches to health promotion that do not consider differing contextual factors are unlikely to succeed. In particular, innovative strategies to disseminate knowledge among disadvantaged population groups are needed.

Key words: reproductive health; demography; women; Asia; HIV/AIDS

INTRODUCTION

The spread of HIV infection from high to low risk population groups in India runs in parallel with increasing rural prevalence and with a trend to infection of large numbers of women by their partners (Gangakhedkar *et al.*, 1997; Newmann *et al.*, 2000; Pallikadavath and Stones, 2003b; UNAIDS, 2002). The overall HIV prevalence was non-uniform in 2002, antenatal sentinel estimates being over 1% in some of the central,

southern, and north-eastern states and lower in the northern states (NACO, 2003a). These apparently low percentages translate to very large absolute numbers, placing India at the forefront of the global epidemic with an estimated population with HIV between 3.82–4.58 million in the year 2002 (NACO, 2003a).

A primary and essential step towards hindering the spread of HIV to women is knowledge.

The NFHS-2 overview report showed that for the whole of India, awareness of the existence of AIDS among women was around 40% (IIPS and ORC Macro, 2000) but rapid changes are under way. In 2001 70% of women and 82.4% of men had heard of the virus or disease (NACO, 2003b) although these two surveys are not wholly comparable owing to different methodology. Despite overall improvement in levels of knowledge, women consistently lag behind men, reflecting the overall context of gender relations in India that constrain women's access to education in general and health related knowledge in particular.

The present study focussed on rural areas of two states where the prevalence of HIV in urban areas is relatively high: the western state of Maharashtra (MHA) and the southern state of Tamil Nadu (TN). Available data are as follows. In 2001, NACO reports gave the prevalence of HIV among women attending antenatal clinics as 1.38% in MHA and 1.14% in TN. By the end of 2003 the number of known HIV positive individuals in TN was 24 667 and 9234 in MHA. According to the NFHS-2 survey knowledge of AIDS among ever-married women in the whole of MHA and TN were 61% and 87%, respectively (IIPS and ORC Macro, 2000). Overall levels of awareness among women were 77% for MHA and 87% for TN but urban-rural differentials were present with levels of 90% for urban and 69% for rural MHA. In TN, the corresponding figures were 94% and 84% (NACO, 2003b).

The 2001 Census (Census of India, 2001) showed MHA and TN to have populations of 96.1 million and 62.1 million respectively, and similar rural percentages of 58% (MHA) and 56% (TN) and female literacy 67.5% (MHA) and 64.5% (TN). Each has a very large city as the state capital: Greater Mumbai (16.4 million) and Chennai (6.4 million). There are contextual differences between the two states which are highlighted as follows. While more women read newspapers or magazines in MHA (32%) compared to TN (23.1%), more women in TN (51.7%) listen to the radio compared to women in TN (36.1%). Interestingly, in TN about 22% women reported attending the cinema at least once a month compared to about 8% in MHA. In TN about 39% women were employed outside their homes compared to 29% in MHA. In TN about 79% women have access to money compared to 64% in MHA (IIPS and ORC Macro, 2000).

The present study aimed to characterize the extent and correlates of knowledge about AIDS

among rural women in the two states. The specific objectives were to identify (i) factors associated with awareness of AIDS among women, (ii) factors associated with women's knowledge on whether or not AIDS can be avoided, and (iii) factors associated with levels of knowledge about what can be done to avoid AIDS. Finally, we aimed to relate the statistical findings to potential approaches to health education and health promotion.

METHODS

Anonymized NFHS-2 data were made available in the academic domain during 2002 via the Measure DHS website (<http://www.measuredhs.com>). Subsets for rural MHA ($n = 3162$) and rural TN ($n = 3056$) were used for analysis in the present study. The survey design and sampling methodology have been reported (IIPS and ORC Macro, 2000). Analyses were carried out in SPSS for Windows version 10. After cross tabulation with chi-square tests logistic regression was selected as the primary tool for analysis because of the binary nature of the dependent variable, i.e. 'knowledge' or 'no knowledge'. Odds ratios were generated to indicate the magnitude of associations for each variable such as educational attainment expressed in appropriate categories. Associated 95% confidence intervals and probabilities were calculated to demonstrate statistical significance at various levels.

The initial logistic regression analysis was done modelling the responses YES and NO to the question 'Have you heard of an illness called AIDS?' In the survey, all women who responded that they had heard of AIDS were further asked 'Is there anything a person can do to avoid AIDS?' This question generated three possible answers: 'YES, there are ways to avoid AIDS', 'NO, there are no ways to avoid AIDS', and 'Do not know'. As there were very few 'Do not know' responses, these were combined with the 'NO' category to create two groups, 'YES' and 'Others'. The second logistic regression modelled these responses. Throughout the paper we refer to 'AIDS' rather than 'HIV' to maintain consistency with the questions used in the survey. These did not distinguish between knowledge about asymptomatic infection and the consequent disease.

Further questions were asked of women who answered 'YES' above. Respondents were asked

'What can a person do to avoid getting AIDS?' and asked to give yes/no responses to a series of items. Among the items were some misconceptions but as these attracted very few responses they were not considered further in the analysis. The items included in the analysis were: 'abstain from sex'; 'use condoms'; 'have only one sex partner'; 'avoid sex with commercial sex workers'; 'avoid sex with homosexuals'; 'avoid blood transfusions'; 'avoid injections'; 'avoid IV drug use'; 'avoid sharing shaving kits/razors'. After scrutinizing the distribution of responses, individuals were characterized as falling within 'low' and 'high' correct knowledge groups by scoring their responses. Because of its special importance in the prevention of HIV transmission condom use was scored 0 if reported NO and 4 if reported YES. The other items were scored 0 if reported NO and 1 if reported YES. Scores were interpreted such that 0–1 represented 'no–low' knowledge and 2 and above represented 'moderate–high' knowledge. These two groups were used for generating the third set of logistic regression models.

We framed the hypothesis that three main groups of factors would explain the differences observed in women's AIDS related knowledge. These groups were: individual characteristics of women, household socio-economic characteristics, and lifestyle and reproductive health variables. Women's characteristics available for analysis included age, educational level and occupation. Household social and economic characteristics included religion, caste, and standard of living. Lifestyle and reproductive health variables included watching television every week, a visit by a family planning worker in the last 12 months, discussion of family planning with her partner, ever use of modern family planning methods, and the type of information media through which awareness of AIDS was acquired.

RESULTS

Table 1 presents an overview of knowledge variables. In both states, women's age, education, work, standard of living, exposure to television and all the three types of AIDS knowledge were significantly associated. Religion and awareness of AIDS was significantly associated in both states, but not detailed knowledge of transmission of HIV. Women's caste affiliation and awareness of AIDS was associated in both the states. However,

knowledge of the means of transmission of HIV was significantly associated with caste in TN only. While visits by a health worker and all aspects of AIDS knowledge were significantly associated in TN, awareness of AIDS was the only component significantly associated with caste in MHA. Ever-use of modern family planning methods was significantly associated with awareness of AIDS in MHA. In TN, it was significant for awareness of AIDS and awareness of correct knowledge of transmission of HIV. Discussion of family planning with partners was significantly associated with awareness of AIDS and correct knowledge of transmission of HIV in MHA. In TN it was significant for all aspects of AIDS knowledge.

Factors associated with awareness of AIDS

Table 2 shows factors associated with the AIDS awareness among rural women in the two states in a multivariate analysis.

Women's characteristics

In rural TN, the odds of having awareness of AIDS in age group 35–49 was nearly 35% lower than for the age group 15–24 years while knowledge of AIDS was similar across all age groups in MHA. As might be anticipated, the odds of having awareness of AIDS increased with increasing educational level in both states, with the main contrast being between those having 'no education' and all other categories. The impact of women's education at primary and secondary levels on awareness of AIDS was stronger in rural TN than in rural MHA. Being engaged in agriculture was associated with around 30% lower odds of AIDS awareness in rural MHA but not in rural TN.

Household socio-economic characteristics

The odds of AIDS awareness were unrelated to religion in either state. However, women reporting membership of a 'scheduled tribe' were less likely to have heard of AIDS with odds around 65–77% lower than those classified as 'scheduled castes' in both states. An interesting finding is the favourable odds for AIDS knowledge found among those from a 'scheduled caste' background, whereas the opposite might have been anticipated. The standard of living index and awareness of AIDS showed significant

Table 1: Percentage of women who had AIDS awareness in rural Maharashtra and Tamil Nadu, 1998–99

Variables	Maharashtra			Tamil Nadu		
	% aware of AIDS	% aware that AIDS can be avoided®	% having high correct knowledge®®	% aware of AIDS	% aware that AIDS can be avoided®	% having high correct knowledge®®
<i>Women's characteristics</i>						
Age group						
15–24	49.1 ^b	59.7 ^b	60.1 ^b	88.7 ^b	90.4 ^b	50.3 ^a
25–34	49.7	61.4	60.3	85.9	86.4	44.0
34–49	43.2	53.7	51.3	75.2	82.7	42.4
Education						
No education	25.1 ^b	39.7 ^b	30.9 ^b	69.0 ^b	77.8 ^b	26.2 ^b
Primary	49.8	48.1	43.2	88.5	85.6	45.4
Secondary	76.5	66.6	65.3	97.3	95.3	57.0
Higher	97.4	95.3	79.7	100.0	98.6	86.8
Work						
Not working	66.7 ^b	72.5 ^b	65.5 ^b	88.8 ^b	88.8 ^b	53.1 ^b
Professional/Clerical/service	83.5	86.7	86.4	91.2	90.3	63.7
Agriculture/unskilled/others	38.4	46.9	44.7	77.3	83.7	37.0
<i>Household socio-economic characteristics</i>						
Religion						
Hindu	46.6 ^b	57.9	57.6	81.9	85.8	44.0 ^b
Muslim	50.9	61.4	45.7	87.9	91.3	47.9
Others	57.9	64.4	65.8	87.0	88.3	71.4
Caste						
Scheduled caste	51.2 ^b	58.1	55.0	79.0 ^b	84.8	35.6 ^b
Scheduled Tribe	25.0	57.1	50.0	52.8	73.7	14.3
Other Backward Caste	47.9	61.2	59.6	83.9	86.6	48.5
Others	52.6	57.7	58.3	100	100	50.0
Standard of living Index						
Low	28.1 ^b	41.8 ^b	35.4 ^b	74.6 ^b	81.4 ^b	34.3 ^b
Medium	56.8	59.8	58.4	87.4	88.8	47.2
High	84.7	76.8	72.7	97.0	95.0	73.9
<i>Lifestyle and reproductive health factors</i>						
Watch Television every week						
No	26.5 ^b	37.6 ^b	28.4 ^b	72.9 ^b	81.6 ^b	36.0 ^b
Yes	71.5	67.6	64.7	90.5	89.2	68.6
FP worker visited						
No	42.6 ^b	57.6	53.7 ^b	80.0 ^b	84.4 ^b	42.9 ^a
Yes	59.9	36.2	64.8	87.9	89.9	49.7
Discussed FP with partner						
No	44.9 ^b	57.7	53.9 ^b	81.5 ^b	85.4 ^a	43.2 ^b
Yes	63.9	63.0	73.7	89.8	91.2	60.0
Ever use of F P						
No	40.1 ^b	55.4	59.3	84.0	85.5	43.2 ^b
Yes	51.2	59.7	57.0	80.2	86.4	46.1
All	47.4	58.6	57.7	82.3	86.0	45.1
	<i>n</i> = 3162	<i>n</i> = 1500	<i>n</i> = 879	<i>n</i> = 3021	<i>n</i> = 2513	<i>n</i> = 2162

Notes: ® based on women who have heard of AIDS; ®® based on women who are aware that AIDS can be avoided.
^b, ^a indicate $p < 0.01$; $p < 0.05$, respectively in chi-square tests.

positive associations in both states: the odds of AIDS knowledge were more than double among the 'high standard of living' group relative to the 'low standard of living' group.

Lifestyle and reproductive health variables

The odds of having awareness of AIDS were about 2–3 times greater among women who watched television relative to those who did not

Table 2: Odds of women's awareness of AIDS, rural Maharashtra and Tamil Nadu, 1998–99

Variables	Maharashtra			Tamil Nadu		
	OR	95% CI		OR	95% CI	
		Lower	Upper		Lower	Upper
<i>Women's characteristics</i>						
<i>Age group</i>						
15–24 (Reference)						
25–34	1.028	0.804	1.315	1.012	0.728	1.408
35–49	1.013	0.783	1.312	0.644 ^b	0.465	0.893
<i>Education</i>						
No education (Reference)						
Primary	1.984 ^b	1.597	2.465	2.815 ^b	2.177	3.640
Secondary	5.170 ^b	4.070	6.566	9.865 ^b	6.022	16.161
Higher	31.986 ^b	9.616	106.363	nc	–	–
<i>Work</i>						
Not working (Reference)						
Professional/Clerical/service	1.563	0.777	3.142	1.721	0.846	3.500
Agricultural/Unskilled/other	0.713 ^b	0.573	0.886	0.981	0.763	1.261
<i>Household socio-economic characteristics</i>						
<i>Religion</i>						
Hindu (Reference)						
Muslim	1.022	0.634	1.649	1.165	0.574	2.362
Others	1.066	0.704	1.614	1.007	0.519	1.953
<i>Caste</i>						
Scheduled caste (Reference)						
Scheduled Tribe	0.351 ^b	0.231	0.533	0.230 ^b	0.107	0.491
Other backward castes	0.464 ^b	0.324	0.662	0.813	0.645	1.024
General	0.695 ^a	0.497	0.971	nc	–	–
<i>Standard of living Index</i>						
Low (Reference)						
Medium	1.612 ^b	1.326	1.959	1.561 ^b	1.249	1.952
High	2.495 ^b	1.723	3.614	2.200 ^a	1.034	4.678
<i>Lifestyle and reproductive health factors</i>						
<i>Watched Television</i>						
No (Reference)						
Yes	3.313 ^b	2.742	4.002	2.208 ^b	1.767	2.759
<i>FP worker visited</i>						
No (Reference)						
Yes	1.923 ^b	1.566	2.362	1.339 ^a	1.026	1.748
<i>Discussed FP with partner</i>						
No (Reference)						
Yes	1.030	0.768	1.381	1.020	0.661	1.574
<i>Ever used modern FP</i>						
No (Reference)						
Yes	1.533 ^b	1.240	1.895	1.416 ^b	1.143	1.755

Notes: ^b, ^a indicate $p < 0.01$; $p < 0.05$ respectively. Number of cases: MHA = 3040; TN = 2984.

in both states, with a stronger association for MHA. In both states, women who had been visited by family planning workers at least once in the past 12 months had greater odds of AIDS knowledge, ranging from 1.3 to 1.9, compared to women who had not been visited. However, there was no influence of 'spousal communication' in relation to family planning, adduced from the

question as to whether women had discussed family planning with their partners.

Factors associated with knowledge of whether or not a person can avoid AIDS

As indicated in the Methods section above, three possible responses were recorded to the question

'Is there anything a person can do to avoid AIDS?' Responses were regrouped as 'yes' or 'others' which included 'no' or 'do not know' responses. Results of logistic regression modelling of this response are presented in Table 3. In the two states, most of the categories of women's educational level were significant correlates. In rural MHA, there was a substantial difference between the odds ratios for the 'higher education' category and the other educational categories. This was not so in rural TN where there were no substantial differences between secondary and higher education categories. This suggests that secondary level education in TN had a much stronger impact in rural TN than in rural MHA. Surprisingly, in MHA the odds of reporting YES were ~37% lower among women who had discussed family planning with their partners compared to women who did not. Ever-use of modern family planning methods was also significant for knowledge that AIDS can be avoided but only in rural MHA, and in the expected favourable direction with odds of 1.4. In rural MHA, women who had heard of AIDS via TV and radio were more likely and women who had heard via other media less likely to have heard of the possibility of avoiding AIDS. Women who had heard of AIDS from a combination of electronic media and print media, however, had about four times higher odds of reporting YES compared to women who had heard of AIDS via electronic media alone. The results show differences in the impact of lifestyle and reproductive health variables in the two states suggesting that the rural context of MHA and TN differ in important respects.

Factors associated with levels of knowledge of ways to avoid getting AIDS

As discussed in the Methods section above, responses to the items in this question were grouped so as to provide 'no-low' and 'moderate-high' knowledge categories. The results from logistic regression modelling are presented in Table 4. Women's education was significant for one category in rural MHA, secondary education, with odds of about 1.7, but was significant for all categories in rural TN where the odds of having 'moderate-high' knowledge were ~7 times higher among women who had 'high education' compared to women with 'no education', suggesting that there is a bigger gap between poorly educated and well educated women in rural TN. Women's occupation was

significantly associated with levels of knowledge in rural MHA but not in TN. Thus, in the two states, the impact of educational and employment conditions for women on knowledge of how AIDS can be avoided was substantially different. Religion was a significant variable only in rural TN. Those classified as belonging to 'other religions', in this survey including Christians but not Muslims, had about three times higher odds of having 'moderate-high' knowledge than Hindu women. The standard of living index was significant in both states and in rural TN, the odds of women having 'moderate-high' knowledge were about double among those with a higher standard of living. Watching television every week was significantly associated with knowledge of ways to avoid getting AIDS in rural MHA only, as were visits by a family planning worker in the past 12 months, with 2.4 time greater odds. The association between whether or not family planning was discussed with the partner and knowledge of ways to avoid getting AIDS was significant only in rural TN, with odds of 1.4. In both states, the type of media from which women had heard of AIDS was significantly associated with levels of knowledge.

CONCLUSION

This study addresses basic questions for HIV prevention programmes: have those at risk of contracting the infection even heard of the disease AIDS, and do they know how to avoid it? The study was carried out in Maharashtra and Tamil Nadu where the epidemic is estimated to affect more than 1% of women attending antenatal clinics. The analysis shows that although women's knowledge about HIV/AIDS is increasing, this is in a non-uniform manner, with marked disparities between population subgroups. In both the states those who are non-literate, the poor, agricultural workers, and those affiliated to 'scheduled tribes' are identified as lacking AIDS awareness. Along with these similarities the present study has identified state-specific differences. For example in MHA, visits of family planning workers were influential with respect to knowledge of AIDS but this was not the case in TN. We have demonstrated the scope for dissemination of HIV knowledge through health workers currently engaged in family planning activities (Pallikadavath and Stones, 2003a) and the present analysis suggests that this

Table 3: Odds of women's knowledge of whether or not AIDS can be avoided, rural Maharashtra and Tamil Nadu, 1998–99

Variables	Maharashtra			Tamil Nadu		
	OR	95% CI		OR	95% CI	
		Lower	Upper		Lower	Upper
<i>Women's characteristics</i>						
<i>Age group</i>						
15–24 (Reference)						
25–34	0.926	0.655	1.309	0.857	0.587	1.251
35–49	0.743	0.513	1.077	0.824	0.555	1.222
<i>Education</i>						
No education (Reference)						
Primary	1.022	0.726	1.438	1.298	0.979	1.720
Secondary	1.424 ^a	1.013	2.001	3.634 ^b	2.289	5.769
Higher	7.486 ^b	2.604	21.522	3.318	0.851	12.937
<i>Work</i>						
Not working (Reference)						
Professional/Clerical/Service	1.265	0.527	3.039	1.227	0.598	2.519
Agricultural/Unskilled/other	0.659 ^b	0.489	0.888	1.350 ^a	1.014	1.798
<i>Household socio-economic characteristics</i>						
<i>Religion</i>						
Hindu (Reference)						
Muslim	1.727	0.863	3.458	1.660	0.730	3.773
Others	1.131	0.639	2.004	0.955	0.457	1.996
<i>Caste</i>						
Scheduled caste (Reference)						
Scheduled Tribe	1.801	0.921	3.521	0.469	0.151	1.460
Other backward castes	0.991	0.594	1.651	0.867	0.651	1.154
General	0.836	0.520	1.347	–	–	–
<i>Standard of living Index</i>						
Low (Reference)						
Medium	1.133	0.829	1.549	1.238	0.946	1.619
High	1.392	0.893	2.169	1.409	0.733	2.710
<i>Lifestyle and reproductive health factors</i>						
<i>Watch Television every week</i>						
No (Reference)						
Yes	1.410 ^a	1.017	1.954	1.172	0.893	1.539
<i>FP worker visited</i>						
No (Reference)						
Yes	0.998	0.749	1.330	1.382 ^a	1.015	1.884
<i>Discussed FP with partner</i>						
No (Reference)						
Yes	0.632 ^a	0.427	0.936	1.139	0.695	1.868
<i>Ever used modern FP</i>						
No (Reference)						
Yes	1.470 ^a	1.072	2.017	1.112	0.858	1.442
<i>Media</i>						
Electronic media (Reference)						
Other media	0.430 ^b	0.303	0.609	0.686 ^b	0.501	0.939
Electronic and print media	3.936 ^a	1.080	14.348	high	–	–
Electronic and other media	1.341	0.967	1.860	2.378 ^b	1.719	3.291
All media	4.445	0.726	27.203	high	–	–

Notes: ^b, ^a indicate $p < 0.01$; $p < 0.05$ respectively. Number of cases: MHA = 1157; TN = 2178.

resource is under-utilized, especially in TN. In the above report we identified the inaccessibility of women who have been sterilized to HIV related health education delivered via family

planning workers and the present study confirms their vulnerability: in MHA adopters of modern family planning methods (predominantly sterilization) were highly unlikely to possess correct

Table 4: Odds of women's knowledge levels about what can be done to avoid getting AIDS, rural Maharashtra and Tamil Nadu, 1998–99

Variables	Maharashtra			Tamil Nadu		
	OR	95% CI		OR	95% CI	
		Lower	Higher		Lower	Higher
<i>Women's characteristics</i>						
<i>Age group</i>						
15–24 (Reference)						
25–34	1.037	0.632	1.703	0.822	0.617	1.096
34–49	0.998	0.571	1.745	0.937	0.685	1.281
<i>Education</i>						
No education (Reference)						
Primary	0.808	0.460	1.417	1.833 ^b	1.423	2.360
Secondary	1.784 ^a	1.060	3.002	1.862 ^b	1.391	2.494
Higher	1.873	0.776	4.520	6.891 ^b	3.273	14.511
<i>Work</i>						
Not working (Reference)						
Professional/Clerical/service	5.204 ^b	1.474	18.368	0.969	0.557	1.687
Agriculture/unskilled/other	0.770	0.507	1.169	1.078	0.848	1.370
<i>Household socio-economic characteristics</i>						
<i>Religion</i>						
Hindu (Reference)						
Muslim	0.894	0.358	2.231	1.178	0.663	2.093
Others	1.717	0.765	3.851	2.903 ^b	1.602	5.262
<i>Caste</i>						
Scheduled caste (Reference)						
Scheduled Tribe	1.598	0.574	4.452	0.216	0.032	1.454
Other Backward Caste	1.768	0.822	3.802	1.308 ^a	1.019	1.679
Others	2.379 ^a	1.155	4.897	0.415	0.072	2.381
<i>Standard of living Index</i>						
Low (Reference)						
Medium	2.036 ^b	1.228	3.376	1.123	0.893	1.411
High	3.140 ^b	1.640	6.013	2.073 ^b	1.344	3.197
<i>Lifestyle and reproductive health factors</i>						
<i>Watch Television every week</i>						
No (Reference)						
Yes	1.803 ^a	1.011	3.213	1.205	0.957	1.516
<i>FP worker visited</i>						
No (Reference)						
Yes	2.391 ^b	1.539	3.716	1.161	0.915	1.474
<i>Ever use of FP</i>						
No (Reference)						
Yes	0.631	0.386	1.030	1.137	0.911	1.420
<i>Discussed FP with partner</i>						
No (Reference)						
Yes	1.381	0.772	2.468	1.478 ^a	1.042	2.096
<i>Type of Media</i>						
Electronic media (Reference)						
Other media	0.426 ^b	0.232	0.782	0.640 ^b	0.453	0.904
Electronic and print media	8.247 ^a	1.457	46.684	4.234 ^b	1.962	9.137
Electronic and other media	1.450	0.945	2.222	1.962 ^b	1.548	2.487
All media	Nc	–	–	12.740 ^b	5.663	28.663

Notes: ^b, ^a indicate $p < 0.01$; $p < 0.05$ respectively. Number of cases: MHA = 602; TN = 1845. Reference group: 'Low correct knowledge'.

knowledge about transmission of HIV, although they were aware of AIDS. Thus special educational interventions directed towards these women are required. More generally, the pattern of variation in knowledge calls for innovative approaches that can reach population sub-groups rather than a 'one size fits all' approach.

What are the reasons for the different patterns of knowledge seen among rural women in the two states? Some might be explained by the much higher media attention given to cases of AIDS detected in TN in the early stages of the epidemic, but other important factors may be the greater disparities between urban and rural lifestyles, education and economic conditions in the two states. Urbanization is a powerful driver of changed family relationships: for example among low income communities in the city of Chennai (the TN state capital) there has been a redrawing of the traditional pattern of relations between mothers in law and daughters in law (Vera-Sanso, 1999). By contrast in rural TN all aspects of living conditions for the landless poor continue to be constrained by geography that determines the pattern of agriculture and seasonal employment, as well as inter-caste relations and problems in accessing safe water, food, clothing and shelter (Rajuladevi, 2001). With regard to literacy, MHA has achieved considerable overall progress. However, district level variations reflect both different levels of economic development but also higher than average concentrations of people from the 'scheduled castes' and 'scheduled tribes' in rural districts that have levels of literacy below the average for the state (Saldanha, 1999).

The present study is limited by the crude nature of the questions asked as part of a large family health survey. All items were closed with no scope to explore meaning or dimensions of knowledge in the socio-cultural context. On the other hand, the formal census-based sampling strategy allows the findings to be generalized to the wider population. It is important to undertake informative qualitative work in specific settings to provide complementary perspectives. For example, the low percentage rate of HIV infection and the life cycle of the epidemic mean that the population at large are typically not exposed to its direct consequences through knowing friends or relatives who are infected or suffering from AIDS. Given the very adverse overall conditions faced by many poor people, using a qualitative approach in a rural

area of MHA we showed that HIV is understandably low on their list of concerns, compared to employment, education and general health. Nevertheless, the experiences of HIV-infected men and women included stigma, ostracism and economic catastrophe for the whole family (Pallikadavath *et al.*, 2005).

The present study has been concerned with correlates of women's knowledge of HIV/AIDS in rural areas of the two states. Interventions directed towards men are considered to be central to the control of heterosexual transmission because of the greater ease of transmission from men to women than vice versa and the use dynamics of barrier contraception in male-dominated cultures. In designing interventions for men, however, it is necessary to consider carefully the likely impact on the vulnerable sub-groups of women identified in this study and to include knowledge of HIV/AIDS among these subgroups as outcome measures for interventions targeting men. With regard to specific health educational strategies, a systematic review of interventions to prevent HIV infection in heterosexual men identified examples of studies in developing countries that used educational interventions in the workplace (Elwy *et al.*, 2002). In the rural setting where un-organized agricultural labour predominates, structured workplace interventions would be difficult to design. However, in TN and MHA there is scope to target men through rural social institutions such as farmers' co-operatives and village councils.

In the wider context of community mobilization consideration is needed as to whether programmes should focus exclusively on HIV/AIDS or select a range of health topics. The latter approach was successful in a rural African setting using influential intermediaries (Babalola *et al.*, 2001). In Thailand the successful national campaign to control the spread of HIV infection involved co-ordinated policies and activities amounting to 465 projects of 373 organizations in 1999 with an average budget of just under US\$5000 (Ainsworth *et al.*, 2003). Brain (Brain, 1995) reported that participation of community leaders in programme development and implementation led to a higher level of perceived ownership of the programmes and that this ownership led to sustainable and effective interventions. Paralleling earlier African experience (Dalrymple and Du Toit, 1993) a number of Indian NGOs have taken up drama-based educational activities and participation was

shown both to dispel misconceptions and to foster a more kindly attitude to HIV positive individuals (Valente and Bharath, 1999).

The present study identifies potential for specific resources to be mobilized for health promotion in the two states. The statistical models highlight the particular relevance of television in MHA, the role of rural health workers in TN and of schools in both states. Improving access to each of these would significantly increase the opportunities for health promotion messages to reach a wider population. Television has penetrated many rural areas and represents a jump for many from a predominantly oral culture into the electronic information age. While state run television in India originally had a strong mission to provide information for rural development, the trend to commercialization has led to a higher proportion of entertainment content. This is not necessarily a negative development as far as the use of television for dissemination of health education messages is concerned, as it is likely that such messages would have greater impact when contextualized in entertainment programming such as soap operas. Sociological research on the impact of television in rural MHA suggests that viewers are not passive: 'villagers use television in ways that make sense to them. They watch television to discover new life styles, validate ideas, beliefs and aspirations and find answers to questions that have ramifications both locally and regionally.' (Johnson, 2001). The same author identified the emergence of an information underclass of those who do not have access to television: 'while television has made a significant contribution to breaking down the informational barriers between the higher and lower status members of the community, it has also contributed to further alienating a small segment of the lower class'. Such alienation is of particular concern in relation to access to knowledge for health protection. Further research is required to assess whether the apparently lower impact of television watching on aspects of knowledge about HIV seen for TN in the present study reflects real differences in the place of television in rural life compared to MHA.

Schools have a dual role in increasing knowledge about HIV and AIDS. Firstly, a general rise in educational attainment in the community beyond the primary level equips individuals with the tools to access knowledge for health protection. Secondly, there is the potential

for direct school-based interventions in sexual health. Such programmes are common in western countries and in Africa, where an evaluation highlighted the importance of active as opposed to didactic teaching methods (Nyamwaya, 1996). The effectiveness of school-based and community initiatives for sexual health can also be enhanced by peer education (Kirby *et al.*, 1994; Popoola, 1999). The Indian National Aids Control Organization lists 'School AIDS Education Programmes' as one of four key areas for partnering with NGOs (NACO 2003c) and refers to the incorporation of relevant material into the high school curriculum.

At the heart of the process of involving community leaders, peers and members of the target groups in various approaches to health promotion is the empowerment of the participants through the development of interpersonal, social and political skills and resources (Schulz *et al.*, 1995). A wide range of interventions have been successful in raising awareness of AIDS, increasing knowledge of infection routes and how to avoid becoming infected. While single approaches, such as mass media or school-based interventions offer opportunities for many people to be reached, the messages may be poorly understood or acted upon without accompanying reassurance, skills and opportunities for participants to examine their values and attitudes. In rural areas where access to mass media and education are limited there is a particular need for community engagement to counteract the marginalization of vulnerable groups so as to foster the development of an 'empowered, participating community' (Tones and Tilford, 2001).

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