HIV and AIDS   Social and Behavioral Science Research (SBSR)

2008

Patterns and implications of male migration for HIV prevention strategies in Karnataka, India

Niranjan Saggurti
Population Council

Ravi K. Verma

Pranita Achyut

Saumya RamaRao
Population Council

Anrudh K. Jain
Population Council

Recommended Citation

Patterns and Implications of Male Migration for HIV Prevention Strategies in Karnataka, India

Niranjan Saggurti, Ravi K. Verma, Pranita Achyut, Saumya Ramarao and Anrudh Jain

Karnataka is one of the high HIV prevalence states in India. Results from National Family Health Survey (NFHS-3) indicate that 0.69 percent of adults aged 15-49 were infected with HIV in 2005-2006 (IIPS and Macro International, 2007). According to the sentinel surveillance system data, HIV prevalence among pregnant women receiving antenatal care in Karnataka was 1.25 percent (NACO, 2006). Further, 18 of the state's 27 districts have recorded HIV prevalence of more than 1 percent among pregnant women receiving antenatal care in sentinel sites (NACO, 2006).

Strong male migration patterns are evident in some of the high HIV prevalence districts of the state. According to the 2001 census, Karnataka ranks fourth in terms of total in-migration, with 2.2 million men on the move from 1991 to 2001. A poor agrarian economy in north Karnataka, has resulted in high levels of migration to and from the neighboring states of Maharashtra, Tamil Nadu and Andhra Pradesh (KHPT, 2007; Menon, 2004). These northern districts are believed to be particularly vulnerable to HIV infection.

To inform HIV prevention efforts, the Population Council, through funding from the Avahan, it's India AIDS Initiative of the Bill & Melinda Gates Foundation, studied the patterns and motivations related to migration of male laborers and their linkages with HIV risk. As part of this study, the Council conducted a systematic analysis of 2001 census data on migration and district-level sentinel surveillance data on HIV

Large numbers of semi-skilled and unskilled men, most of whom are migrants, gather at "labor addas" (pick-up points) looking for employment for the day.

prevalence. The purpose of the research was to document patterns of male migration and determines whether there was a relationship between migration and HIV prevalence. In particular, the analysis sought to answer the following questions:

- What is the pattern of male in- and out-migration at the state level? What is the volume of male in-migration and the change over time?

- What is the pattern of male in- and out-migration at the district level? Which districts attract large numbers of migrant men and from where?
- What are the dominant streams of male in-migration? Is it rural to rural, rural to urban, or urban to urban?
- Is there a relationship between HIV prevalence and migration patterns, both in and out at the district level?

Data and Methods

The male migration data from India's 2001 census and HIV prevalence data from India's HIV surveillance system among antenatal clinic (ANC) attendees and sexually transmitted disease (STD) clinic attendees are presented here. The 2001 census, like previous censuses, collected information on migration for all individuals by place of birth and last residence. Data on last residence, along with details such as duration of stay at the current residence and reason for migration, provided useful insights for studying migration dynamics.

District-level data on HIV prevalence among ANC clinic attendees were obtained from the published reports[1] of NACO's surveillance systems data[2].

A range of methods univariate statistics for measuring levels, bivariate and rank correlation are used to examine relationships. The place of last residence data was cross-tabulated with duration of stay at the place of enumeration to examine the patterns and changes in volume of migration over time. The percentages of men migrated within district (intra-district)[3], across districts (inter-district)[4] and across state (inter-state)[5] were calculated to define the patterns of movement along with the dominant migration streams.

The rank order correlation method was used to examine the association between volume of migration and HIV prevalence in ANCs at the district level. In this process, the 27 districts were first ranked according to volume of in- and out-migration at interdistrict and interstate levels. The average of these two ranks was then calculated.

Similarly, the average HIV prevalence data among ANC clinic attendees for the years 2003, 2004, 2005 and 2006 was calculated, and the average HIV prevalence data was then ranked. The rank of districts according to migration was plotted on a scatter diagram against the rank of districts according to HIV prevalence among ANC clinic attendees to examine the relationship.

Inter-State Male Migration

Figure 1: Dominant trends in inter-state male migration from and to Karnataka, 2001

Note: Thickness of the line represents the volume of migration and arrow indicates the direction.
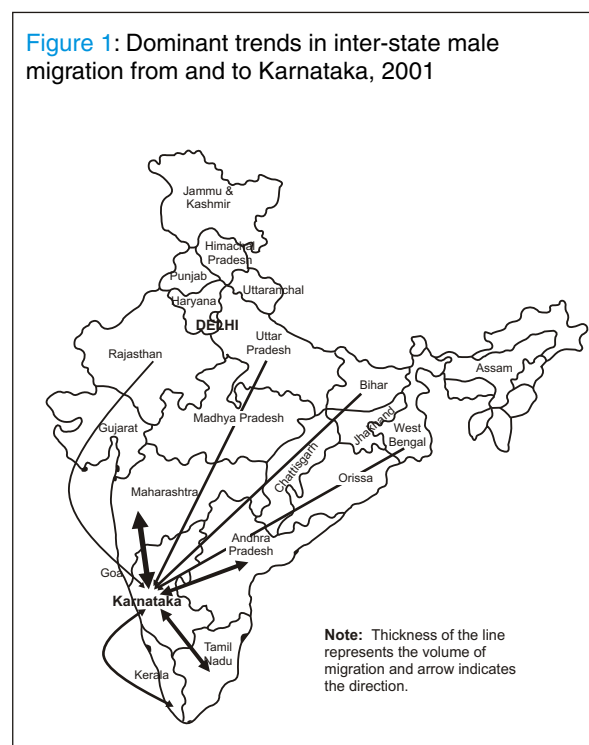
[1] Documenting the geographic variation in HIV-1, its determinants and intervention coverage in 115 districts in Southern India, Annex files-Karnataka tables, <http://www.cghr.org/KN.pdf>;NIHFW & NACO, 2006

[2] Because the data on HIV prevalence among STD clinic attendees were available only for seven districts, these data have not been used for analysis.

[3] A person who moves from his place of usual residence or birth to another politically defined area (village/town) within the same district of enumeration is an intra-district migrant.

[4] A person who crosses the boundary of the district of enumeration but remains within the state of enumeration is an inter-district migrant.

[5] A person whose place of enumeration lies in a different state from his/her place of birth or last residence is an inter-state migrant.

According to the 2001 census, Karnataka experienced net male in-migration at the state level: 345,298 males moved out of the state while 440,623 males entered from 1991-2001. During 2000 to 2001, however, comparatively higher numbers of men moved out of the state than entered the state.

Maharashtra, Goa, Andhra Pradesh, Tamil Nadu and Kerala are the most popular destinations for Karnataka males (see Figure 1). The majority of men coming into Karnataka are from the states of Maharashtra, Andhra Pradesh, Tamil Nadu, Kerala, Rajasthan, Uttar Pradesh and Bihar.

A comparison of migrant males in the 1991 census who lived 0-9 years at their current residence with migrants in the 2001 census who lived 10-19 years at their current residence suggests that a large majority of migrants who arrived in Karnataka from 1981-1991 (45 percent) had changed their place of residence by 2001. This suggests that a significant proportion of migrant men do not stay in any place for long durations.

Bangalore, the capital of Karnataka, is the hub for inter-state migrants, with around 0.22 million (50 percent of the total interstate migrants) men entering the district from 1991-2001. The other destinations for inter-state migrant men are the districts of Belgaum (9 percent), Dakshina Kannada (6 percent) and Bellary (4 percent). The 2000-2001 data show that the proportion of migrants to Belgaum has increased further, to 22 percent, while decreasing in Bangalore in the same time period.

Among those migrants who entered Karnataka from outside the state during 1991-2001, 64 percent are from the districts of Kolhapur, Mumbai, Sangli and Beed in Maharashtra; Dharmapuri, Vellore, Chennai and Salem in Tamil Nadu; and Kurnool, Chittoor and Ananthapur in Andhra Pradesh.

Male Migration at the District Level

Figure 2: Major trends in inter-district male migration to the major in-migrating districts, Karnataka, 2001

Note: Thickness of the line represents the volume of migration and arrow indicates the direction.
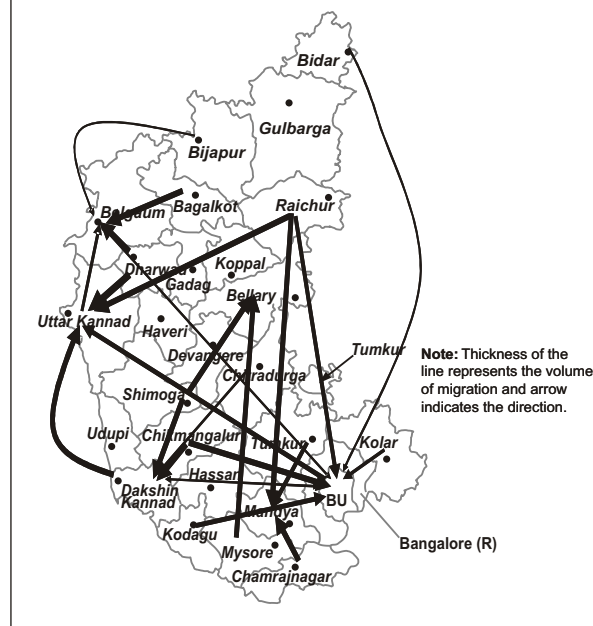
Analysis of inter-district migration data shows a predominance of male migration to Bangalore and a few districts in the western and northwestern part of Karnataka namely, Dharwad (6 percent), Belgaum (5 percent), Mysore (5 percent), Dakshina Kannada (4 percent), Bagalkot (4 percent), Davanagiri (4 percent), Tumkur (4 percent) and Shimoga (4 percent) (see figure 2). Taken together, these districts drew around half of all male migrants from other districts in the state.

From 1991-2001, the overall percent share of male inter-district in-migration to Bangalore is almost one-third (30.8 percent). However, comparing 2000- 2001 versus 1991-2001, several other districts experienced an increase in in-migration: Belgaum (8.9 percent versus 4.7 percent), Dakshina Kannada (7.4 percent versus 3.7 percent) and Uttar Kannada (7.8 percent versus 2.9 percent), while the percent share of in-migration to Bangalore in 2000-2001 declined to only 15 percent.

Some of the destination districts such as Bangalore, Tumkur, Dharwad, Shimoga and Mysore are also the sending districts. Karnataka's other sending districts are Hassan, Bijapur, Kolar and Mandya.

Intra-district migration accounts for almost half of the total male migration in Karnataka. The districts with high male intra-district migration are: Belgaum (14 percent share out of total intra-district migration), Dakshina Kannada (8.4 percent), Uttar Kannada (6.4 percent) and Bangalore. Incidentally, these three districts also are the major destinations for inter-district in-migration.

Male Migration Streams

In the period between the last two censuses (1981-1991 and 1991-2001), the number of males counted as migrants that is, enumerated in places other than their place of birth or previous residence increased 24 percent from 4.6 million in 1991 to 5.7 million in 2001. Little more than half (53 percent) of the total male migrants moved within district, while 30 percent moved across a district but within the state, and 17 percent migrated in from another state (see Table 1). However, in 2000-2001, 24 percent of male migrants came from other Indian states, which is a significant increase (p<0.001) from those who migrated from 1991-1995.

Districts that have received large number of migrants from other states have also attracted men from other districts of Karnataka. Bangalore is one such district. The other prominent destination districts for all three types of in-migration are Belgaum and Dakshina Kannada. These districts seem to attract semi-skilled workforce among the migrant laborers, specifically workers in sugar factories in Belgaum and port activities in Dakshina Kannada.

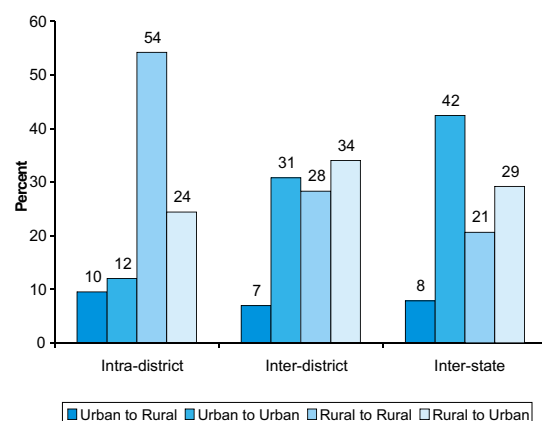| Table 1: Percent share in type of male in-migration by duration of residence at the place of enumeration, Karnataka, 2001						
	Duration of residence **					
Type of male in-migration	Less than 1 year	1-4 years	5-9 years	10+ years	Duration not stated	Total
Intradistrict	43.8	44.7	47.8	48.3	74.3	53.0
Interdistrict	31.7	34.2	34.3	32.6	18.0	30.0
Interstate	23.9	20.4	17.4	18.6	7.6	16.6
Total#	217.9	1220.5	801.5	2210.2	1240.5	5690.6
(Percent*)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

** Total in-migrants by the year 2001 (includes migrants with 10+ years of duration, those who have not stated any duration).
* Total may not add to 100.0 due to small number of international migrants and unclassified category.
# Number of in-migrants is given in thousands. Column percentages are given in the parentheses.

Rural-to-rural migration dominates movement among males who move within districts, whereas urban-to-urban[6] and rural-to-urban migration dominate among those men who move between the districts (see Figure 3). Among males who move between the states, urban-to-urban migration is dominant.

Figure 3: Migration streams in Karnataka, 2001

(bar chart, Percent on y-axis; categories: Intra-district — Urban to Rural 10, Urban to Urban 12, Rural to Rural 54, Rural to Urban 24; Inter-district — Urban to Rural 7, Urban to Urban 31, Rural to Rural 28, Rural to Urban 34; Inter-state — Urban to Rural 8, Urban to Urban 42, Rural to Rural 21, Rural to Urban 29)

Legend: Urban to Rural, Urban to Urban, Rural to Rural, Rural to Urban

Source: Calculated from Census 2001

[6] The 2001 census of India defined urban areas as follows: (a) All statutory places with a municipality, corporation, cantonment board, or notified town area committee, etc., (b) A place satisfying the following three criteria simultaneously:

(i)   minimum population of 5,000
(ii) at least 75 percent of male working population engaged in nonagricultural pursuits; and
(iii) population density of at least 400 per sq. km. (1,000 per sq. mile).

Almost half of males in the high volume in-migration districts of Dakshina Kannada and Mysore moved between urban areas. In Belgaum and Bangalore, men moved from rural to urban areas at the inter-district level.

Urban-to-urban migration is the predominant stream for those entering Karnataka from outside the state, specifically to the districts of Bangalore (53 percent) and Dakshina Kannada (43 percent).

Census data also provide a socio-demographic profile of male migrants. On average, 38 percent of male migrants are between 20-39 years old and 60 percent are currently married. The data also indicates a predominance of male migration in the working age-group of 30-59 years. Two-thirds of these male migrants have moved for the purposes of work/employment or business.

Links with HIV Prevalence

In Karnataka, some of the districts with high volumes of male in-migration such as Belgaum, Dakshina Kannada, Uttar Kannada, Bagalkot, Mysore and Dharwad have recorded a high prevalence of HIV infection among pregnant women attending ANC clinics. Some of the districts with high volumes of male out-migration also recorded a high prevalence of HIV among women attending ANC clinics. Table 2 indicates district-level HIV prevalence among pregnant women attending ANC clinics and patients attending STD clinics in 2003 and 2006.
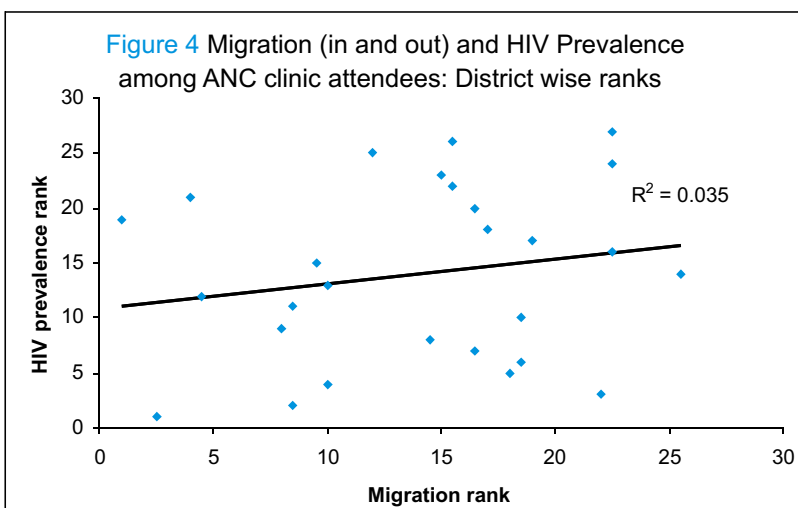
Figure 4 suggests that some districts in Karnataka with high levels of migrationboth in- and out-migrationalso have high HIV prevalence rates among pregnant women attending ANC clinics. Correlation analysis of migration and HIV prevalence data by districts suggests that volume of migration per se has a weak relationship with the districts' HIV prevalence among ANC clinic attendees.

Table 2 HIV prevalence in Karnataka by district, 2003 and 2006

Districts	ANC clinic attendees[#]		STD clinic attendees	
	2003	2006	2003	2006
Bagalkot	2.75	2.125		
Bangalore	1.25	1.375	10.4	5.6
Bangalore Rural	1.875	0.5		
Belgaum	4.44	3.125	27.2	3.6
Bellary	1.625	1.375	10.0	16.4
Bidar	1.395	0.875		
Bijapur	1.625	1.24		
Chamarajnagar	0.505	1.375		
Chikmagalur	0.5	1.5		
Chitradurga	0.375	0.25		
Dakshina Kannada	0.875	0.75	3.2	3.6
Davanagiri	0.875	1.375		
Dharwad 09	3	0.875	16.0	13.6
Gadag	0.875	0.875		
Gulbarga	1.625	0.875	17.2	7.5
Hassan	0.75	2.375		
Haveri	1.39	0.625		
Kodagu	0.25	0.5		
Kolar	1	0.75		
Koppal	4.13	1.625		
Mandya	1.125	0.25		
Mysore	0.5	1	9.3	14.0
Raichur	1.625	1.375		
Shimoga	0.75	0.5		
Tumkur	1.875	0.75		
Udupi	0.875	0.75		
Uttara Kannada	1	1.35		

[#] For each district, the average of the sentinel sites data from urban and rural areas are presented.

Source: NIHFW and NACO, 2006. Annual HIV Sentinel Surveillance Country Report. National Institute of Health and Family Welfare, and National AIDS Control Organization, New Delhi, India.

Figure 4 Migration (in and out) and HIV Prevalence among ANC clinic attendees: District wise ranks

$R^2 = 0.035$

Loading and Unloading Workers Employed Under Contract System.

Discussion

When comparing Karnataka to Maharashtra (Saggurti et.al., 2008) and Andhra Pradesh (Verma et al., 2007) the relationship between migration and HIV prevalence is weak, although the results suggest a positive association.

Census data for Karnataka suggest that the districts of Belgaum, Dakshina Kannada, Bagalkot, Mysore, Dharwad and Bangalore receive a high volume of male migrants from within and outside the state. A considerable volume of the inter-state in-migrants come from some of the high HIV prevalence districts of Maharashtra, Tamil Nadu and Andhra Pradesh, and most of these men are aged 20-39 years and currently unmarried or if married, living alone. These patterns suggest the possibility of correlation between migration and HIV prevalence. However, we caution against such a conclusion since migration per se does not put a male migrant at risk of acquiring HIV. Further in-depth research is needed to unravel the relation between migration and vulnerability to HIV.

The data show that few districts, such as Belgaum, Dharwad, Mysore and Bangalore, rank high for both in- and out- migration as well as for HIV prevalence among ANC clinic attendees. Some of the districts with high out-migration are also the districts with high HIV prevalence among pregnant women attending ANC clinics. Thus, the districts that contributed to male migration are themselves locations for potential HIV interventions.

The results of this analysis suggest that the districts of Belgaum, Dharwad, Bagalkot, Mysore and Dakshin Kannada, which drew large numbers of male in-migrants, should be considered for HIV interventions in Karnataka.

Questions for Further Research

Analysis of census data provides only broad patterns and trends over time. Overlaying HIV prevalence data at the district level on the migration data is an attempt to understand the macro level relationship between the two patterns. The context of high risk including sexual networks for migrant populations needs to be explored in-depth. For better understanding and to inform program design, some of the following questions need to be addressed in future studies:

- What are the implications for male migrants moving from areas with low/high HIV prevalence areas to low/high HIV prevalence areas in terms of sexual networking and high-risk sexual behavior?
- How do migrant populations' risk patterns influence the risk patterns of non-migrant populations in various destination areas?
- Should there be different types of programs for origin and destination migration sites?
- Who should be the primary and secondary beneficiaries of programs? For example, should interventions focus equally on migrants and non-migrants?
- What should be the content of the interventions for example, education, outreach, condom promotion?

References

Centre for Global Health Research, 2006 Documenting the geographic variation in HIV-1, its determinants and intervention coverage in 115 districts in Southern India, Annex files- Karnataka tables. http://www.cghr.org/KN.pdf

KHPT (Karnataka Health Promotion Trust). 2007. HIV and AIDS in Karnataka. Available at: www.khpt.org/hivaids.htm, accessed on 14 December 2007.

Menon P. 2004. Challenges in Karnataka. Frontline, Vol.21, No.26, Dec 18-31. Also available at:http://flonnet.com/fl2126/stories/200412310022 09400.htm

NACO (National AIDS Control Organization), 2006. HIV/AIDS epidemiological Surveillance & Estimation report for the year 2005. Ministry of Health & Family Welfare, Government of India <http://www.nacoonline.org/fnlapil06rprt.pdf>

NIHFW and NACO, 2006, Annual HIV Sentinel Surveillance Country Report. National Institute of Health and Family Welfare, and National AIDS Control Organisation, New Delhi, India.

Registrar General of India, 2001. *Census of India: Karnataka.* D series (Migration tables).

Saggurti N, Verma RK, Jain A, Achyut P and RamaRao S. 2008. Patterns and Implications of Male Migration for HIV Prevention Strategies in Maharashtra, India. Technical Brief from Population Council India, No.3: May.

Verma RK, Saggurti N**,** Das M, RamaRao S, and Jain A. 2007. Patterns and Implications of Male Migration for HIV Prevention Strategies in Andhra Pradesh. Technical Brief from Population Council India, No.1: March.

Acknowledgement

Contributor's Institutional Affiliations

Niranjan Saggurti, Anrudh Jain and Saumya Rama Rao from **Population Council**; Ravi K. Verma and Pranita Achyut from **International Centre for Research on Women (ICRW)**.

Suggested Citation

Saggurti N, Verma RK, Achyut P, Rama Rao S and Jain A. 2008. Patterns and Implications of Male Migration for Prevention Strategics in Karnataka, India. Technical Brief from Population Council India, No.2: June.