

# Migration Streams: Innovating with Data

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# Introduction

- Virtually every adult woman in India is a 'migrant'
  - 300 Million +
- Over 100 million circular migrant workers
- 30%+ of Indian population is migrant
  - 20-30% of the workforce is migrant
- 30 million strong international diaspora
  - 15-20 Million emigrants
- Few million immigrants

# Core Concepts

Volumes and Rates

In-Migration and Out-Migration

Stocks and Flows

Source and Destination

Individuals and Households

Internal and International

# Migration Databases

- Census
- National Sample Surveys
- Other Surveys
- Newer Databases
  - Transport Data
  - Google Mobility
  - Mobile Phone based

# Census of India, 1870s-2011

## Migration

- Place of Birth
- Place of last residence
- Reason for Migration
- Duration of Stay

## Other

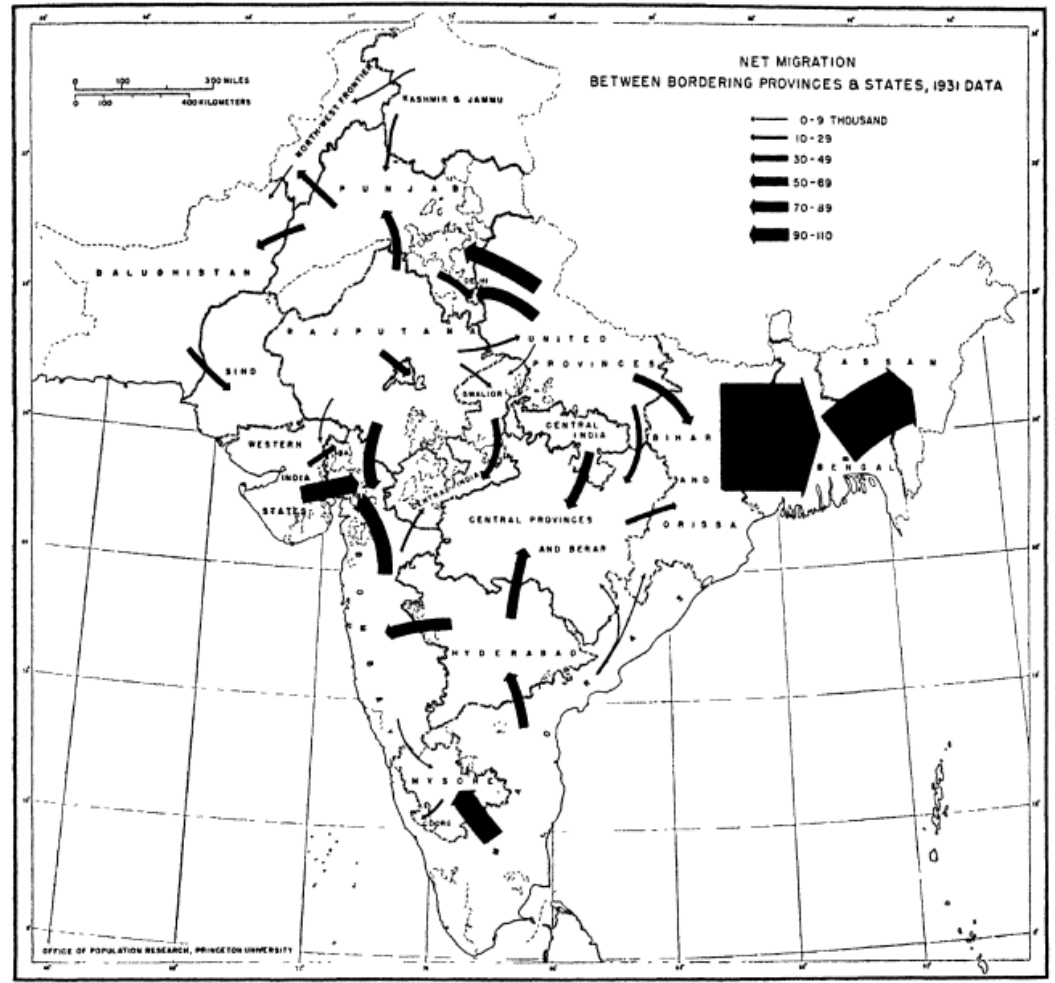
- Sex Ratios
- Language

Special Releases: Census 2001 D-13

Major Limitation of Census data:  
Data on in-migration & not out-migration

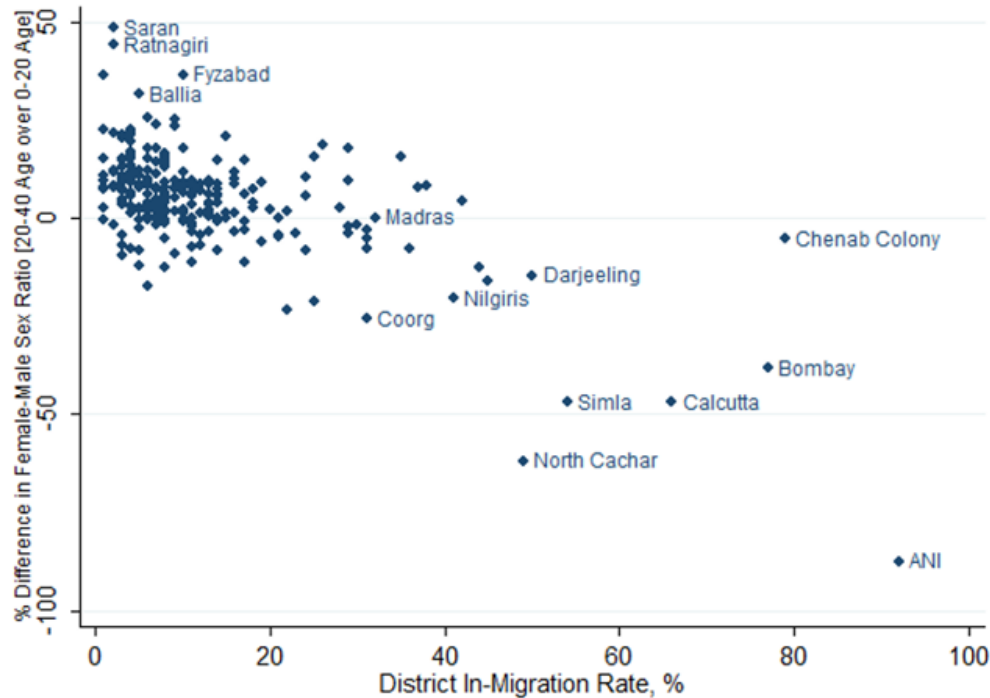
**Kingsley Davis (1951)  
“The Population of India  
and Pakistan”**

**schematic of net inter-  
province male migration,  
1931**



MAP 13 Net Migration Across State and Provincial Boundaries, According to Birthplace Data of 1931.

Figure 2: Migration Indicators at the District Level in India, 1901



Source: Computed from Census of India, 1901, Age and Migration Tables. N=238 Districts covering nearly 90% of the Indian population. ANI= Andaman and Nicobar Islands. In-Migration Rate refers to all migrants born outside the district as a share of district's population.

Source: Chinmay Tumbe, "Internal Migration in India, c. 1850-2020", forthcoming.

# Census 2011 Questionnaire

## Migration characteristics

Fill for person who has come to this village/town from elsewhere

### Place of last residence

**24(a) if within India**, write the present name of the village/town, district and state. Also write '1' for village or '2' for town in the box.

**if outside India**, write the present name of the country and put '-' against village/town and district.

**24(b) at the time of migration**

Rural...1  
Urban...2

### Reason for migration

Work/Employment 1  
Business .....2  
Education .....3  
Marriage .....4  
Moved after birth 5  
Moved with household .....6  
Any other .....7

### Duration of stay in this village/town since migration

↓  
in completed years (write '00' if less than a year)

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Village/Town			
District	<input type="text"/>	<input type="text"/>	<input type="text"/>
State/Country	<input type="text"/>	<input type="text"/>	<input type="text"/>

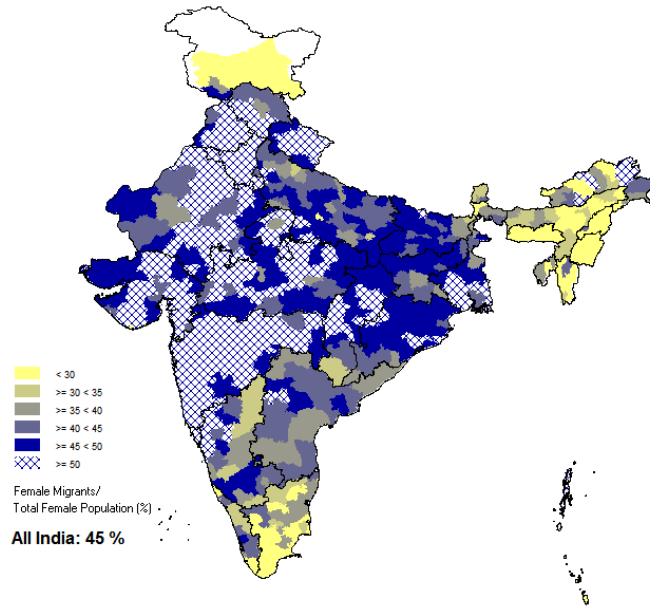


# Census Tables, 2011

- D1 Population by place of birth and sex
- D2 Migrants by place of last residence, sex and duration +SC ST
- D3 Migrants by place of last residence, duration, and reasons District-City-UA +SC ST
- D4 Migrants by place of last residence, age, sex, education level and duration
- D5 Migrants by place of last residence, age, sex, reason, and duration
- D6 Migrants by place of last residence, age, sex, economic activity, and duration
- D7 Migrants by place of last residence 0-9 duration for work by age, sex, education
- D10 Migrants by place of last residence of 0-9 duration by age, sex, marital status
- D11 Persons born and enumerated in districts of the State +SC ST
- D12 Migrants by place of last residence of 0-9 duration by age group and previous state
- D13 Migrants by place of last residence of 0-9 duration by age group and previous state- District level

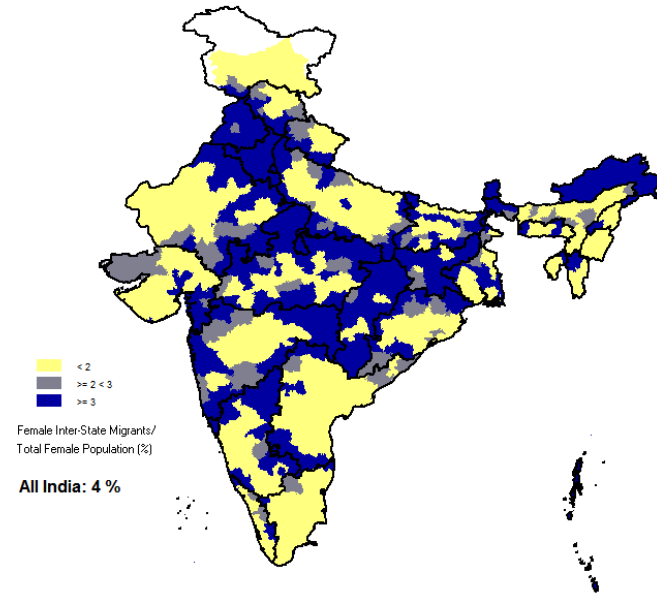
# Women Migration

Female Migrants/ Female Population



Source: Census 2001

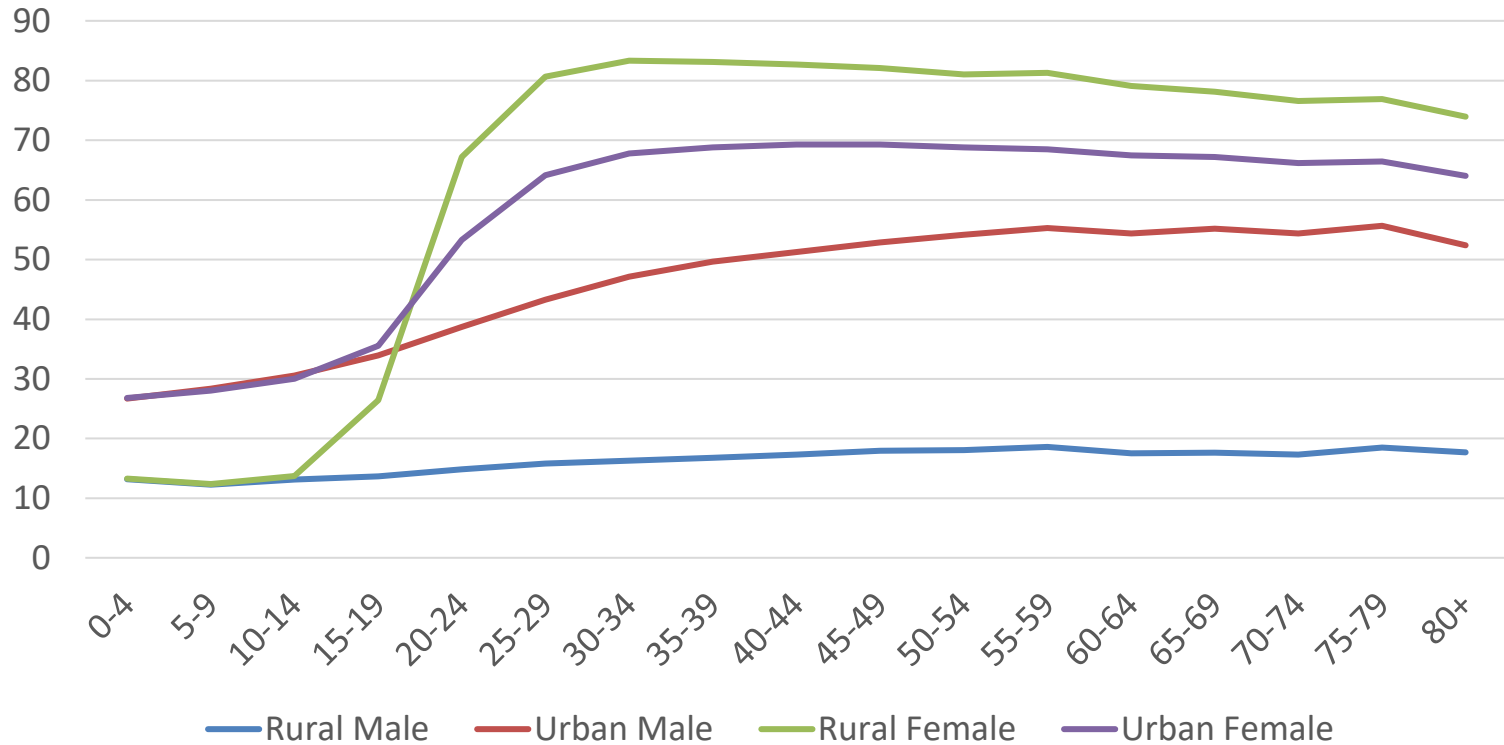
Female Inter-States Migrants/ Female Population



Source: Census 2001

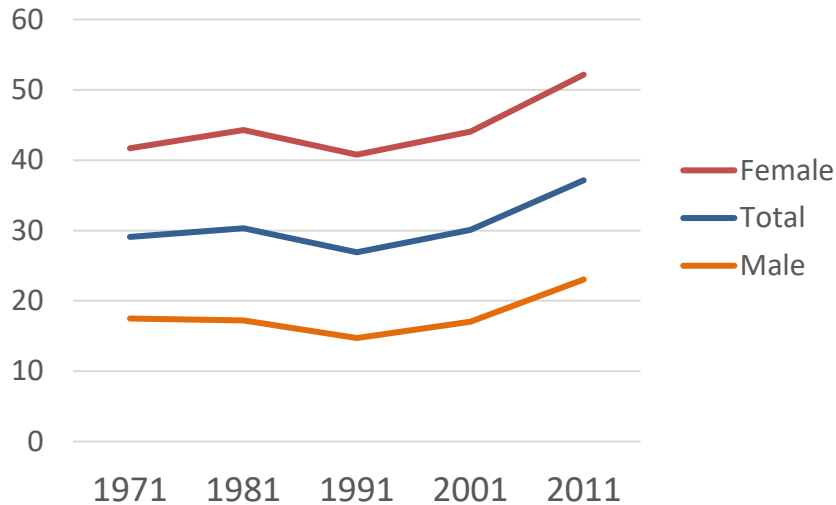
From the author's doctoral thesis, 2012.

## Migration Rates (%) by Age Cohorts

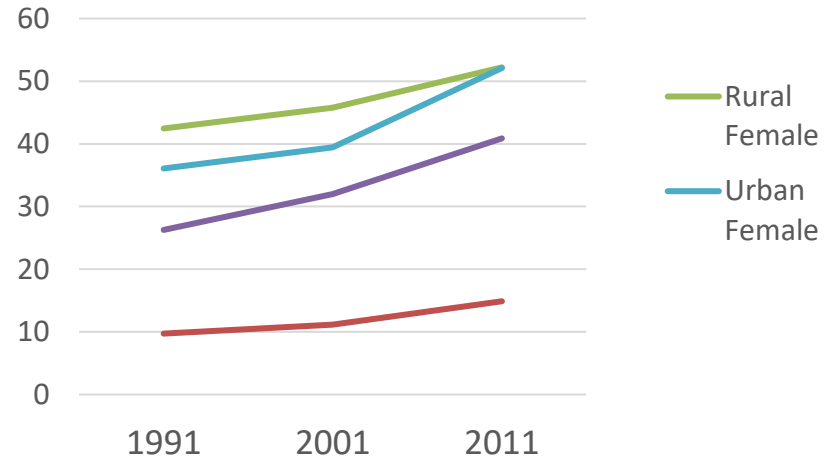


# Internal migration rates shot up in Census data, 2001 to 2011...

Internal Migrants/Population %

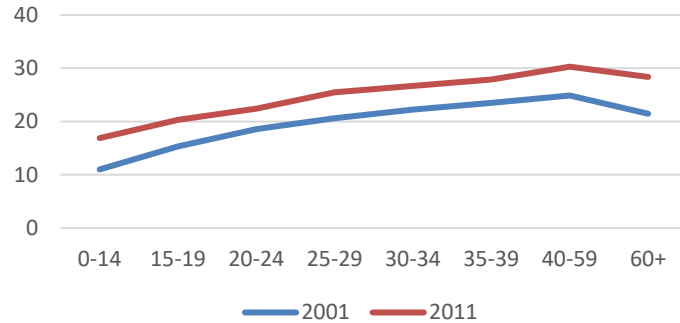


Internal Migrants/Population %  
(By place)

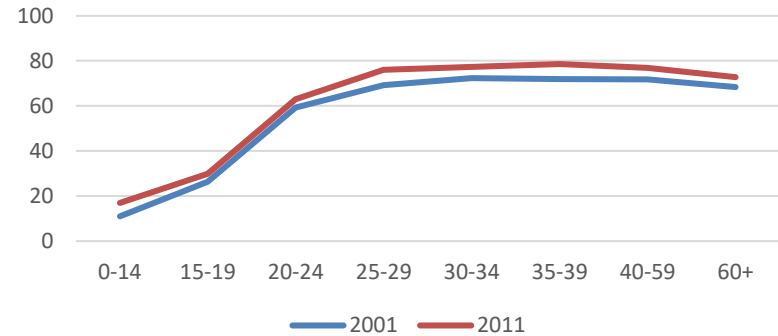


# 2001 vs. 2011: By age

Migration Rates (Male), %, by age cohorts



Migration Rates (Female), %, by age cohorts



# Rural-Urban Migration Dynamics, 1991-2001-2011

## 1991 (In Millions)

From\To	Rural	Urban
Rural	145	40
Urban	13	26
Net Rural-Urban		26

## 2001 (In Millions)

From\To	Rural	Urban
Rural	172	52
Urban	13	37
Net Rural-Urban		39

Decadal Growth Rate in Net Rural-Urban Migration, 1991-2011: 46%

## 2011 (In Millions)

From\To	Rural	Urban
Rural	214	78
Urban	27	78
Net Rural-Urban		51

Decadal Growth Rate in Net Rural-Urban Migration, 2001-2011: 32%

Decadal Growth Rate in Total Population, 2001-2011: 18%

**Table 1. Workforce and Migration for Economic reasons, Census 1991-2011**

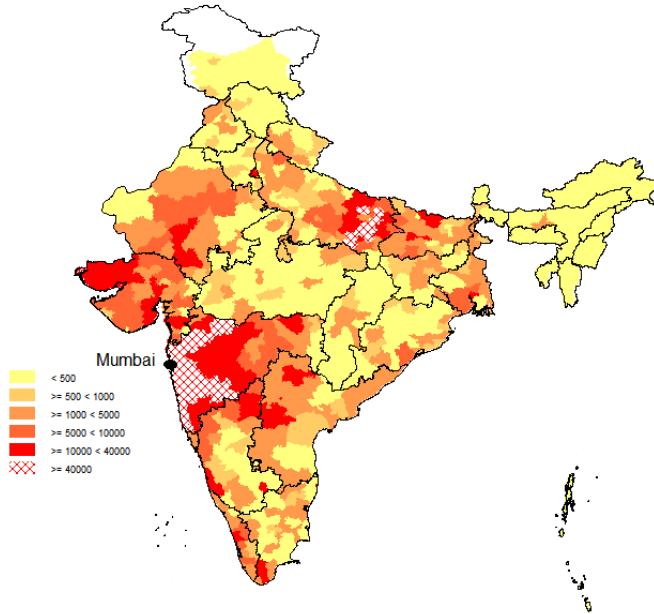
		Growth %				
		1991	2001	2011	1991 to 2001	2001 to 2011
Workforce (million)	Total	317	402	482	2.4	1.8
	Male	227	275	332	2.0	1.9
	Female	90	127	150	3.5	1.7
Migrants stating economic reasons for migration (million)	Total	26	33	51	2.4	4.5
	Male	22	29	42	2.7	4.0
	Female	4	4	9	0.4	7.5
Migrants stating economic reasons for migration as a share of workforce, %	Total	8.1	8.1	10.5		
	Male	9.6	10.4	12.7		
	Female	4.4	3.2	5.7		
Migrants who moved within last one year, stating economic reasons for migration (million)	Total	1.4	2.2	3.5	57	59
	Male	1.1	1.7	2.8	55	65
	Female	0.3	0.5	0.7	67	40
Flow/Stock Ratio (%) among migrants who moved for economic reasons	Total	5.4	6.7	6.9		
	Male	5.0	5.9	6.6		
	Female	7.6	12.1	8.2		

*Source:* Census 1991, 2001 and 2011. Figures for 1991 adjusted for Census absence in J&K in 1991. Migration data for 2011 are taken from provisional D-5 tables. Economic reasons include work, employment and business. Flow/Stock ratio is migration for duration less than a year divided by total stock of migrants. Compound annual growth rates taken for stocks and simple growth rate used for annual flows.

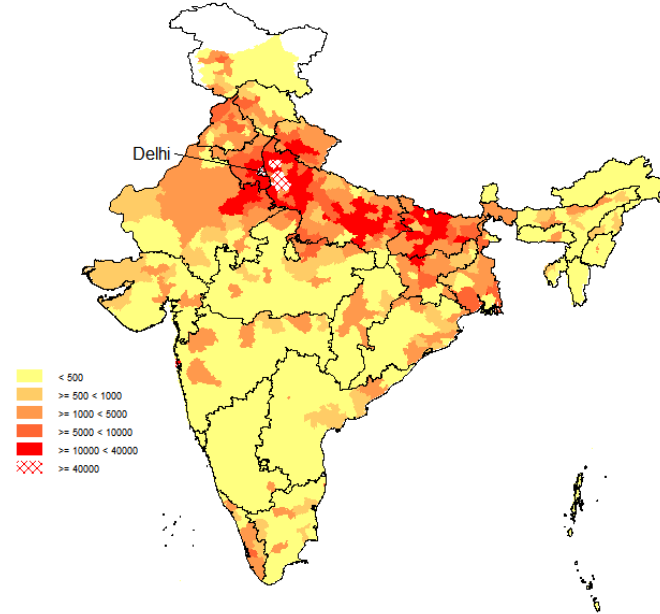
Source: Economic Survey of India, 2016-17.

# Source Regions of Migrants

Mumbai



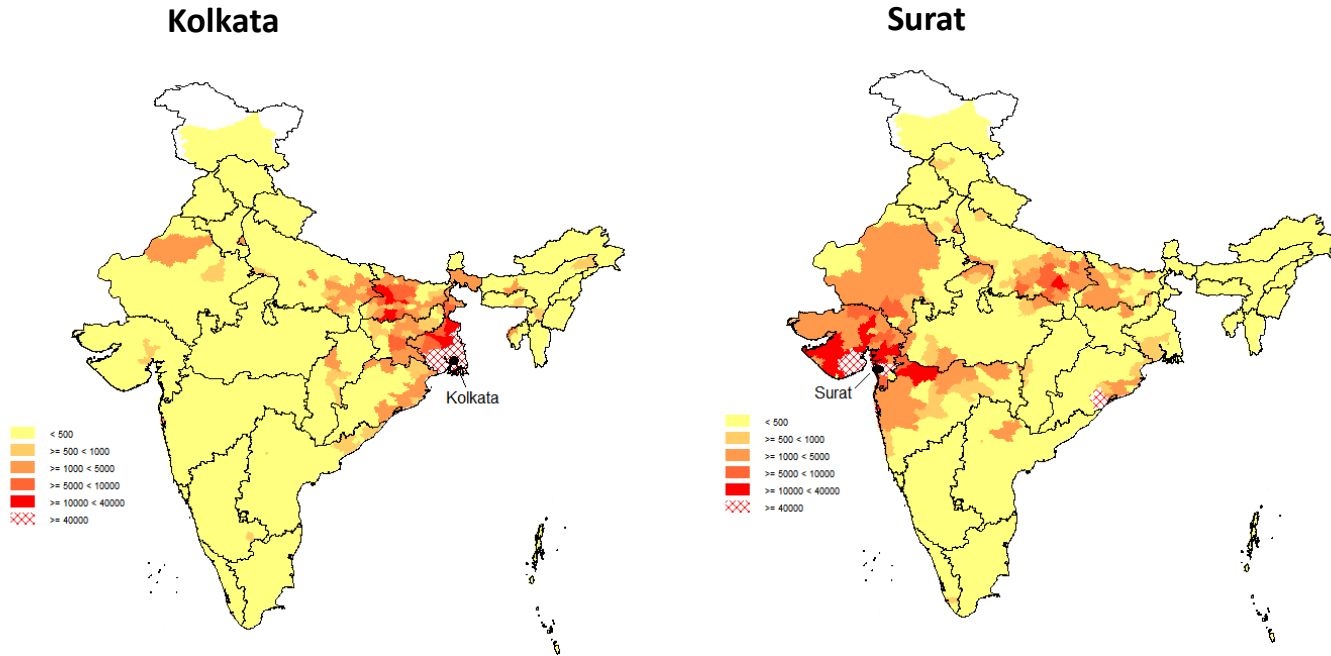
Delhi



For the Period 1992-2001. Source: Census 2001, Table D-13



# Source Regions of Migrants



For the Period 1992-2001. Source: Census 2001, Table D-13

# Inter-City Migration

*Table 5*  
Migration between Major Cities in India (in Thousands), 1992–2001

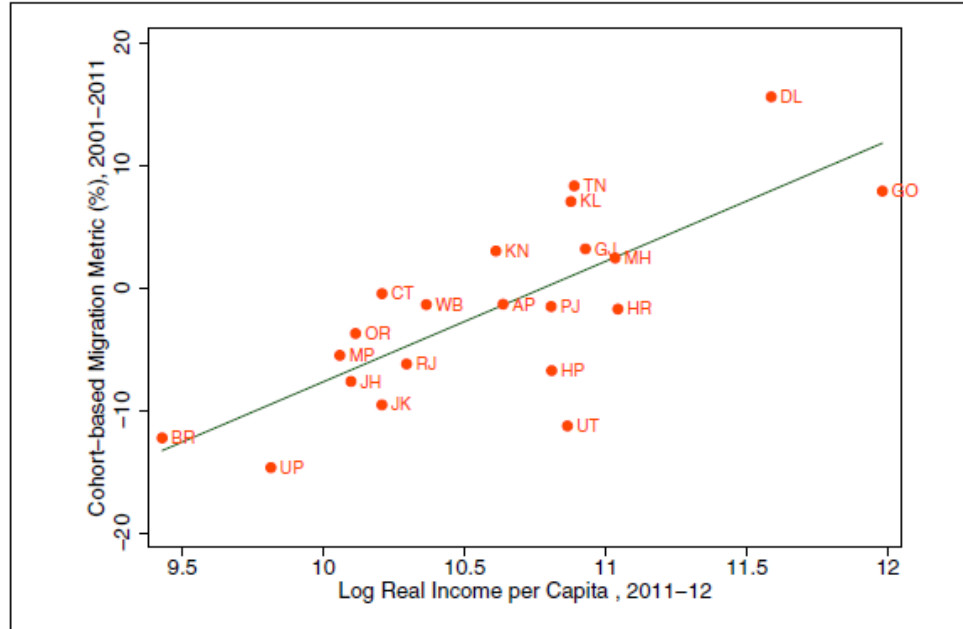
<i>From\To</i>	<i>MUM</i>	<i>DEL</i>	<i>KOL</i>	<i>CHN</i>	<i>BLR</i>	<i>HYD</i>	<i>AHD</i>	<i>PUN</i>	<i>SRT</i>	<i>JPR</i>	<i>Total</i>	<i>Net flow to city</i>
MUM		12	2	5	10	4	11	67	14	2	126	140
DEL	20		4	4	8	3	2	7	1	7	57	34
KOL	63	43		3	9	3	3	7	5	6	141	-130
CHN	19	8	1		20	6	1	3	1	0	59	-37
BLR	10	5	1	7		4	1	3	0	0	30	29
HYD	20	4	1	3	7		1	11	1	0	48	-25
AHD	18	3	1	0	1	1		2	20	1	48	-19
PUN	98	3	0	1	2	1	1		1	0	109	-5
SRT	10	0	0	0	0	0	7	1		0	21	25
JPR	7	13	1	0	1	1	2	1	2		29	-11
Total	266	91	11	23	59	22	29	103	46	17	668	0

Source: Census of India, 2001, D-13. Data for urban populations of districts, rounded to nearest thousand.

Note: “Delhi” refers to National Capital Territory. Other cities correspond to their urban agglomerations. City abbreviations refer to Mumbai, Delhi, Kolkata, Chennai, Bengaluru, Hyderabad, Ahmedabad, Pune, Surat, and Jaipur.

# CMM=Cohort Based Migration Metric

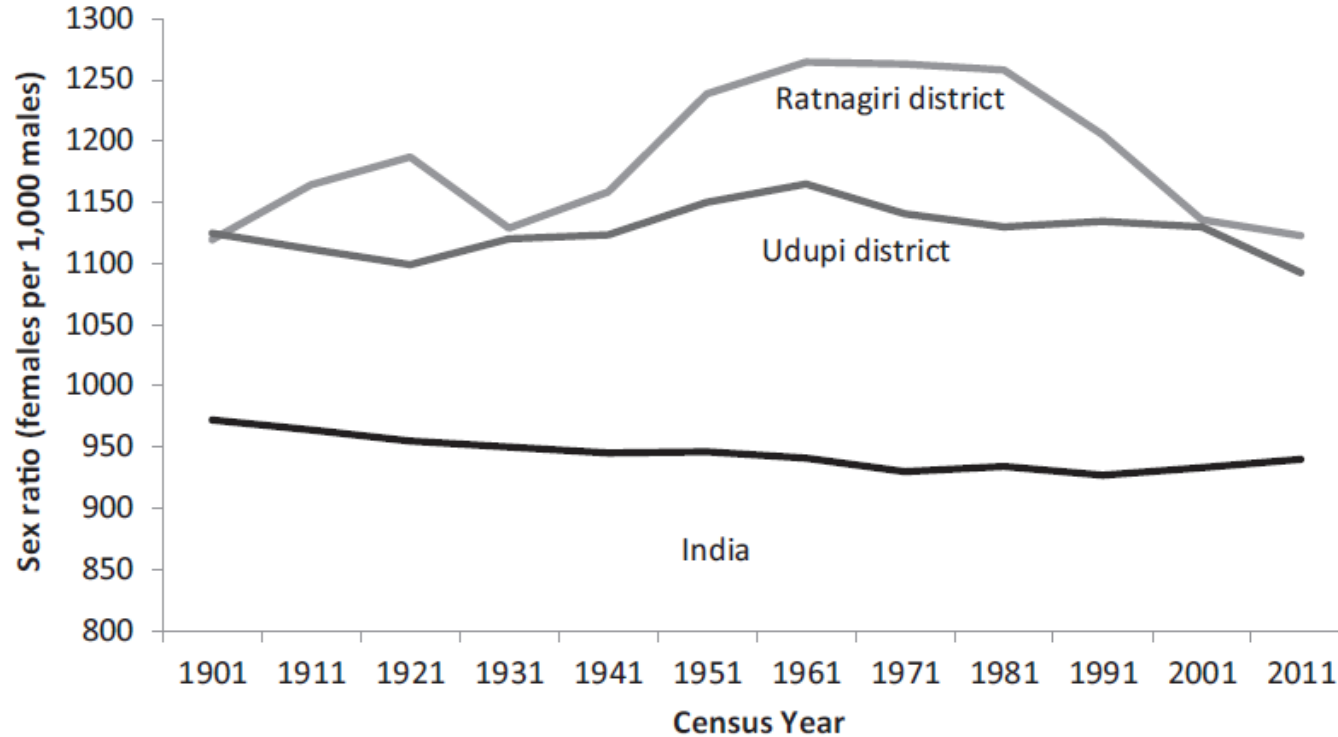
Figure 2. CMM vs. Real Incomes across States



Source: See Appendix I for note on constructing CMM and adjustment of international migration figures for the state of Kerala (KL). CSO data used for real incomes.

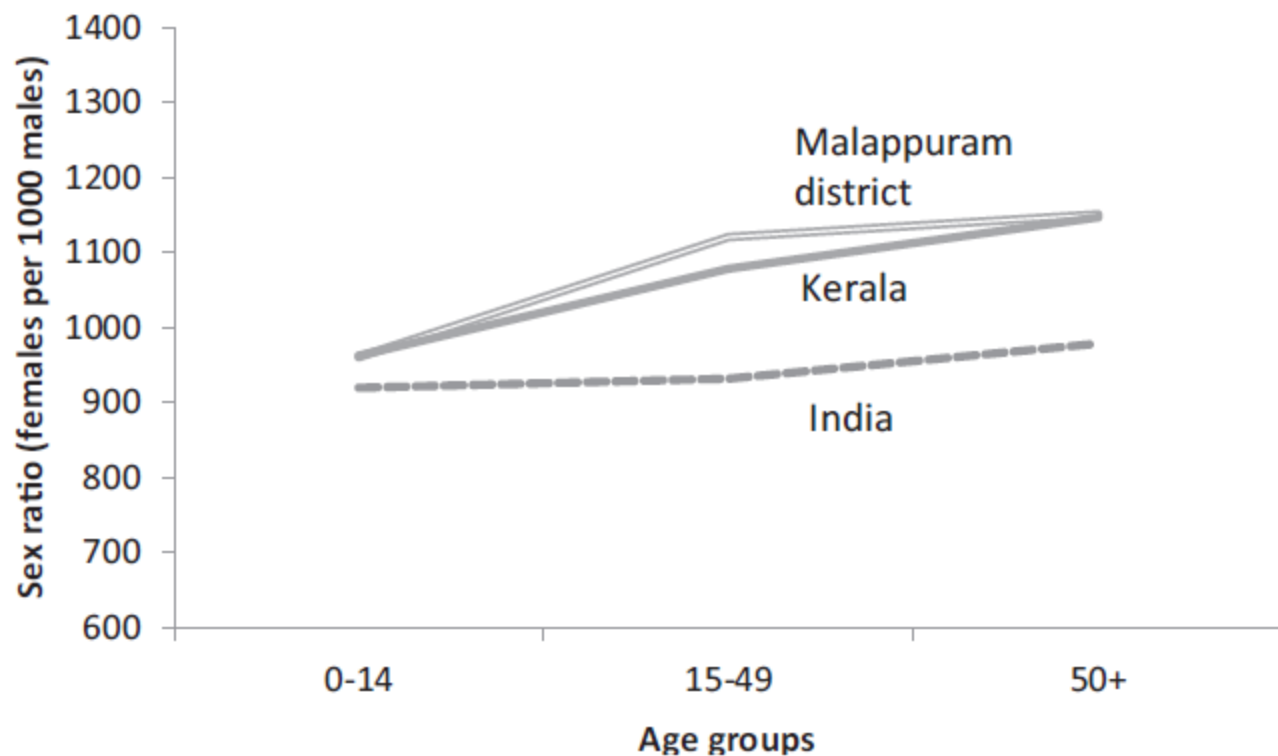
Source: Economic Survey of India, 2016-17.

# Sex Ratios: Male-Migration Persistence



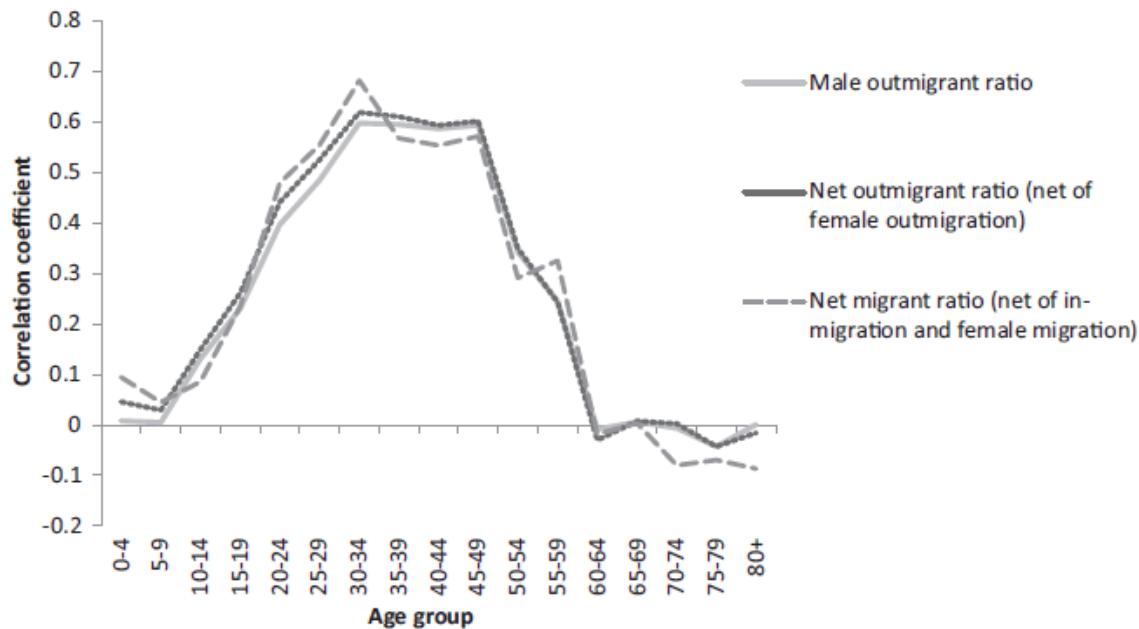
Source: Various Census volumes.

Figure 15.2 Sex ratios across age groups, India and Kerala



Source: Census 2001, India, Table C-14.

Figure 15.4 Correlations between migration variables and age group sex ratios across districts

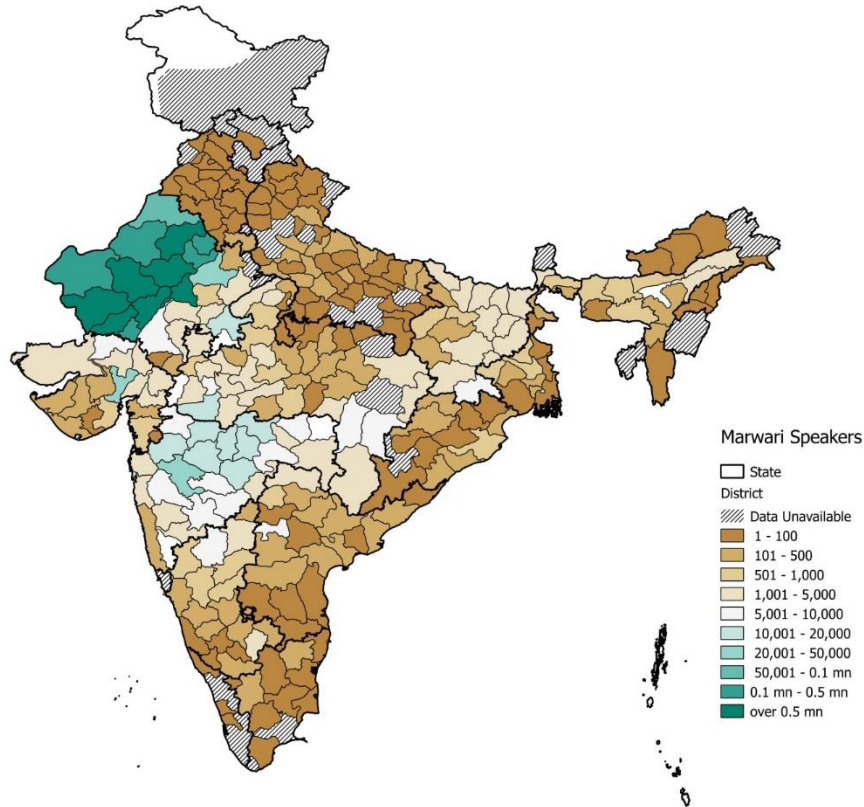


Notes: Correlations are between migration ratios and age group female to male sex ratios across 534 districts. Excludes districts that have a large presence of (male) armed forces as they are not captured in the NSS migration data.

Source: Sex ratio data from Census 2001 Table C-14 and migration data computed from unit level 64th round NSS data (2007–2008).

# Marwaris in 1961

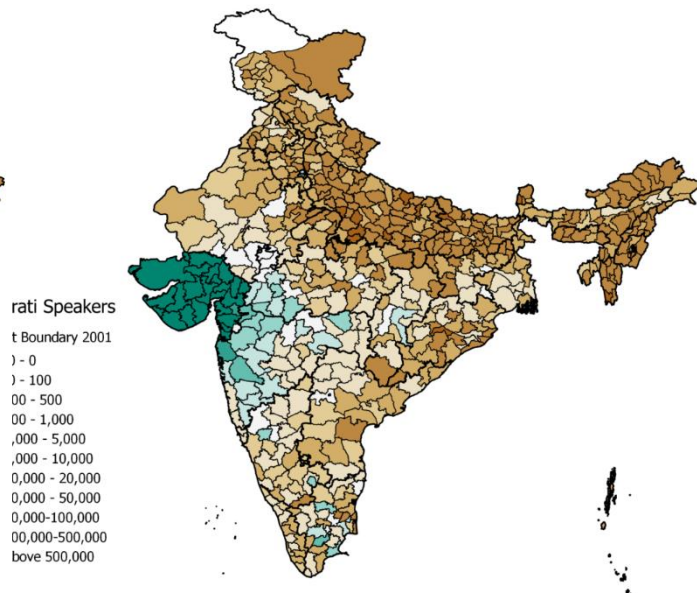
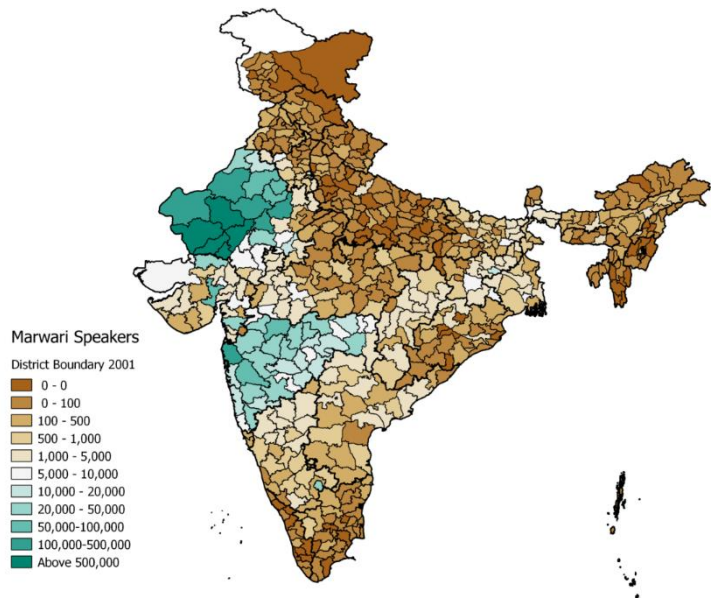
## Language Data of the Census



2001

Marwaris

Gujaratis





# Major Surveys on Migration

- **NSS (Various Rounds)**
  - **64<sup>th</sup> Round: 2007-08**
  - **55<sup>th</sup> Round: 1999-00**
  - **49<sup>th</sup> Round: 1993**
  - **43<sup>rd</sup> Round: 1987-88**
  - **38<sup>th</sup> Round: 1983**
  - **1955-1982: Limited Info in Employment Surveys**
- **KMS (Kerala) by CDS**
  - 1998, 2003, 2007, 2008, 2009, 2010s
- **Goa (2008), Punjab (2010), Gujarat (2011), TN (2015)**
- **Work in Progress**
  - Jharkhand
- **Other Surveys with Migration Info**
  - India Human Development Survey
  - CMIE
  - NCAER surveys
  - National Family Health Survey
  - IFMR (Chennai)
  - World Bank LSMS 1998
  - ICRISAT VLS: 1975-2004

## Migration survey based studies until 2012

### Selected Surveys with Information on Indian Migration

Survey	Year	Survey Based Studies
National Sample Surveys (NSS)	1955-1983 (Limited Info)	Sarvekshana (1977); Visaria & Kothari (1985) and official NSS reports
	1983 (38th Round), 1987-88 (43rd Round), 1993 (49th Round), 1999-2000 (55th Round), 2007-08 (64th Round)	Sarvekshana (1990, 1992); GoI (1993, 1999-2000); Das <i>et al.</i> (2003); Singh (2005a); Shanthi (2006); Dubey <i>et al.</i> (2006); de Haan & Dubey (2006); Kundu & Sarangi (2007); Iversen <i>et al.</i> (2009); GoI (2010b); Tumbe (2011a); Srivastava (2011c); Prabha (2011); Parida & Madheswaran (2011); Joe <i>et al.</i> (2011); de Haan (2011); Keshri & Bhagat (2012); Tumbe (2012d)
Kerala Migration Surveys	1998, 2003, 2007, 2008, 2009, 2010	Studies by Zachariah & Rajan and other CDS researchers; Pelletier (2011)
Goa Migration Survey	2008	GoG (2010); Irudaya Rajan & Zachariah (2011)
Punjab Migration Survey	2010	Forthcoming Report
Gujarat Migration Survey	2011	Forthcoming Report
India Human Development Survey	2004-05	Desai & Dubey (2010); Mueller & Shariff (2009); Desai & Banerji (2008)
Survey of Emigration from India	2003-04	Kapur (2010a)
Survey of Asian Indians in the United States	2004	Kapur (2010a)
NCAER Surveys	1982 & 1999; Other Surveys	Munshi & Rosenzweig (2009)
ICRISAT Village Level Surveys	1975-2004	Badiani <i>et al.</i> (2007); Badiani & Safir (2009)
World Bank Survey of Living Conditions (Uttar Pradesh & Bihar)	1997-98	Edmonds & Salinger (2008)
National Family Health Survey (For Punjab and Kerala)	1992-93	Nanda <i>et al.</i> (1995); Nangia & Saha (2001); Banerjee <i>et al.</i> (2002)

# NSS Data more powerful than Census for Migration research

- 2007-08: Most comprehensive migration survey till date
- Unit level data: Households and individuals
- In-Migration and Out-Migration
  - Seasonal Migration
- Covers Remittances
  
- Examples of studies using NSS migration data
  - Job Recruitment Network Effects (Iversen et al. 2009)
  - Remittance Economy of India (Tumbe 2011)

# NSS Sampling Methodology

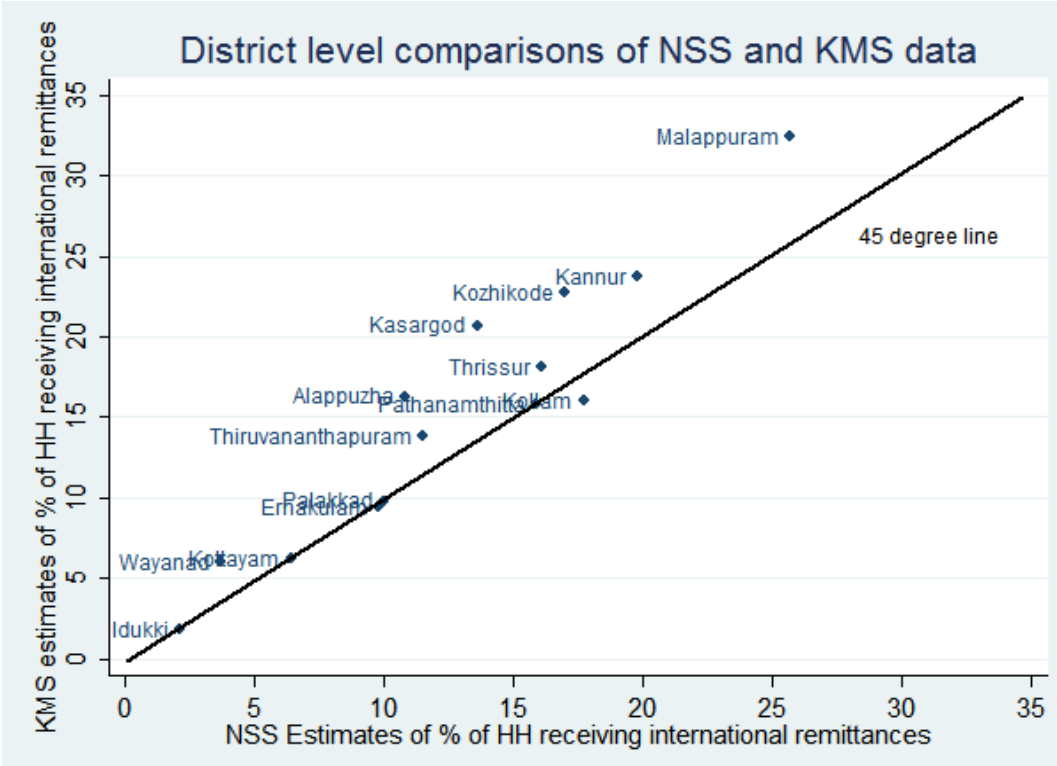
- All India coverage
  - Few Frontier Districts are omitted
- Sampling Frame
  - Rural: Previous Census villages
  - Urban: Urban Frame Survey (UFS) Blocks
- 4 Sub-Rounds throughout the Year
- Central vs. State Sample
- Multi-Stage Stratified Sampling Method
  - FSU: Villages and UFS

# 64<sup>th</sup> Round data, 2007-08

125,578 Households interviewed

- 79,091 in Rural and 46,487 in Urban
- Information on 572,254 People
- Roughly 5,000 Households per State
- Roughly 200 Households per District

# External Validation of NSS data against Kerala Migration Survey Data



## Out-Migrants

[3.1] particulars of out-migrants who migrated out any time in the past (i.e., for households with entry 1 in item 12 bl. 3)									
srl. no	sex ( <i>male-1</i> , <i>female</i> -2)	present age (years)	present place of resid- ence (code)	reason for migra- tion (code)	period since leaving the household (years)	whether presently engaged in any economic activity ( <i>yes - 1</i> , <i>no</i> - 2, <i>not</i> <i>known - 9</i> )	whether sent remittances during the last 365 days ( <i>yes - 1</i> , <i>no - 2</i> )	if 1 in column 8,	
								number of times remittances sent during the last 365 days	amount of remittances sent during the last 365 days (Rs.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
01.									
02.									
03.									
04.									
05.									
06.									
07.									
08.									
09.									
10.									
11.									
12.									
13.									
14.									
15.									
<b>99.</b> total									



# Limitation of (Any) Surveys

- Respondent Fatigue
- Inaccurate Data Entry
  - Always check data if possible
- Sampling Errors
- Under-Sampling of richer households
- Omits entire households that have migrated
  - NSS estimates 4.4 million emigrants vs. actual figure of 10 million



**Table 1** Out-migration for work in India, 2007–2008, % of households

(1)	SSMigHH (2)	RemHH (3)	RemDomHH (4)	RemForHH (5)	NRemHH (6)	OEconHH (7)
All India	4.5	9.2	8.1	1.2	3.0	16.0
Rural	5.8	11.1	10.0	1.2	3.2	19.2
Urban	1.3	4.6	3.6	1.1	2.4	8.0
MPCE quintiles (rural)						
First (Poorest)	9.9	8.1	7.8	0.3	2.4	19.3
Second	7.6	9.7	9.3	0.5	2.4	18.9
Third	6.2	10.6	10.0	0.6	2.8	18.8
Fourth	4.5	11.1	10.1	1.0	3.3	18.0
Fifth	2.7	14.3	11.6	2.8	4.4	20.6
Household type (rural)						
Self-employed in non-agriculture	5.1	7.6	6.6	1.0	2.9	15.0
Agricultural labour	7.6	7.2	6.8	0.4	3.1	16.9
Other labour	9.3	5.1	4.2	0.9	2.3	15.9
Self-employed in agriculture	4.9	13.6	12.5	1.2	3.4	20.9
Other	2.1	21.7	18.6	3.1	4.0	27.0

*Notes:* MPCE = Monthly Per Capita Expenditure, HH = Household, SSMigHH = % of HHs reporting short-term or seasonal migrants, RemHH = % of HHs receiving remittances, RemDomHH = % of HHs receiving domestic remittances, RemForHH = % of HHs receiving foreign remittances, NRemHH = % of HHs with out-migrants for economic reasons and not receiving remittances, OEconHH = % of HHs reporting out-migrants for economic reasons. Column 3 is roughly equal to the sum of Columns 4 and 5. Column 7 is roughly equal to the sum of Columns 2, 3 and 6

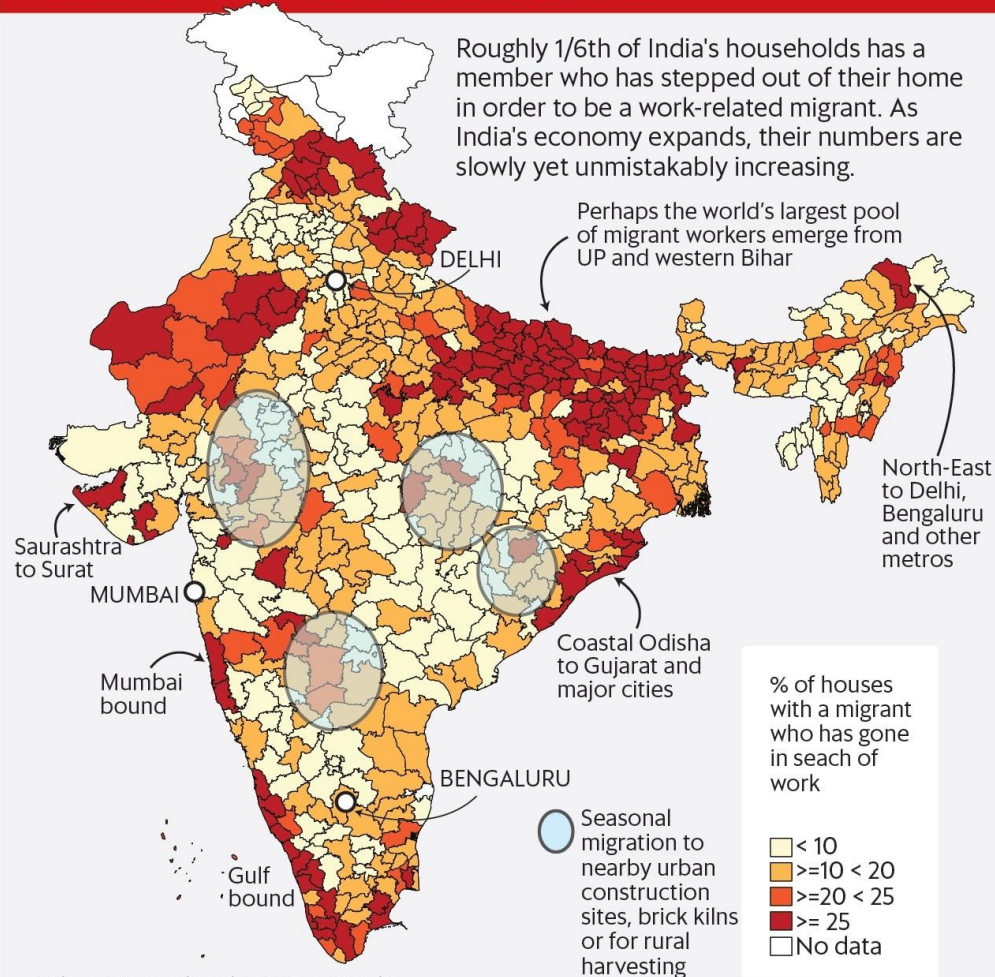
*Source:* Author's estimates based on 2007–2008 NSS data, with sampling weights

## Types of Out Migration, from the NSS 2007-08 data

Source: Tumbe, C (2015). "Missing Men, Migration and Labour Markets: Evidence from India," Indian Journal of Labour Economics, Vol. 58 (2).

# HOTSPOTS OF MIGRATION

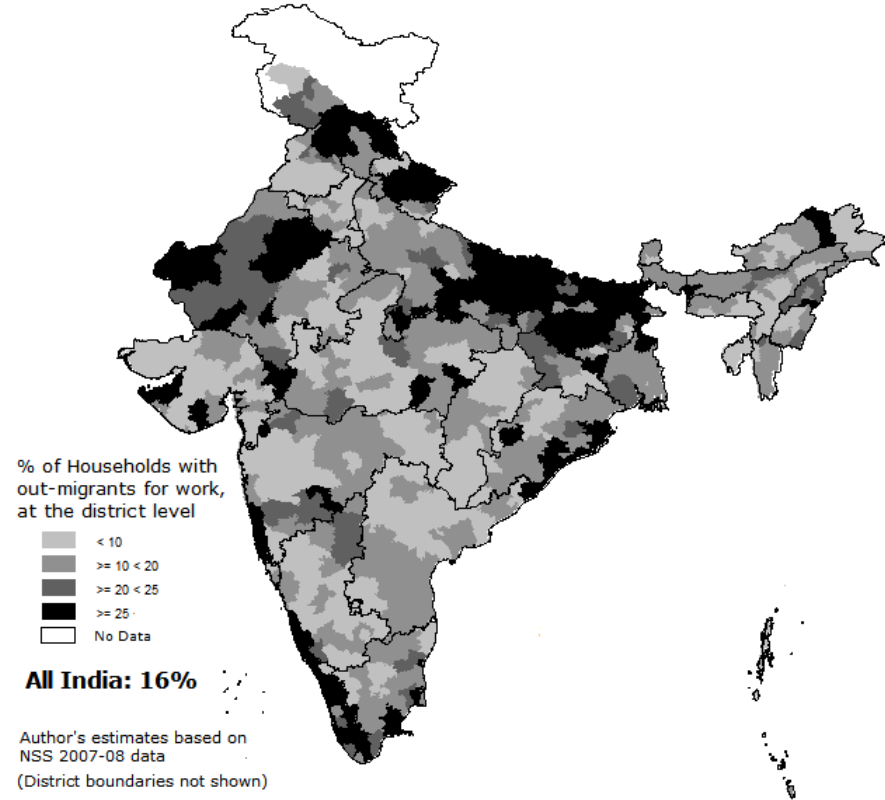
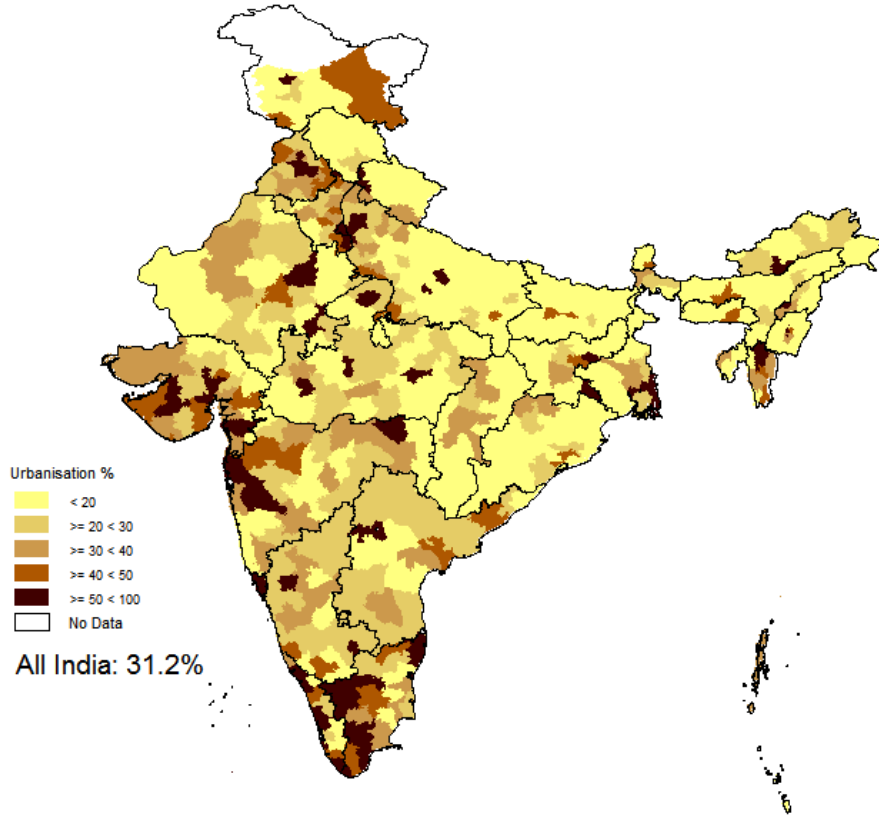
Roughly 1/6th of India's households has a member who has stepped out of their home in order to be a work-related migrant. As India's economy expands, their numbers are slowly yet unmistakably increasing.



# Urbanization

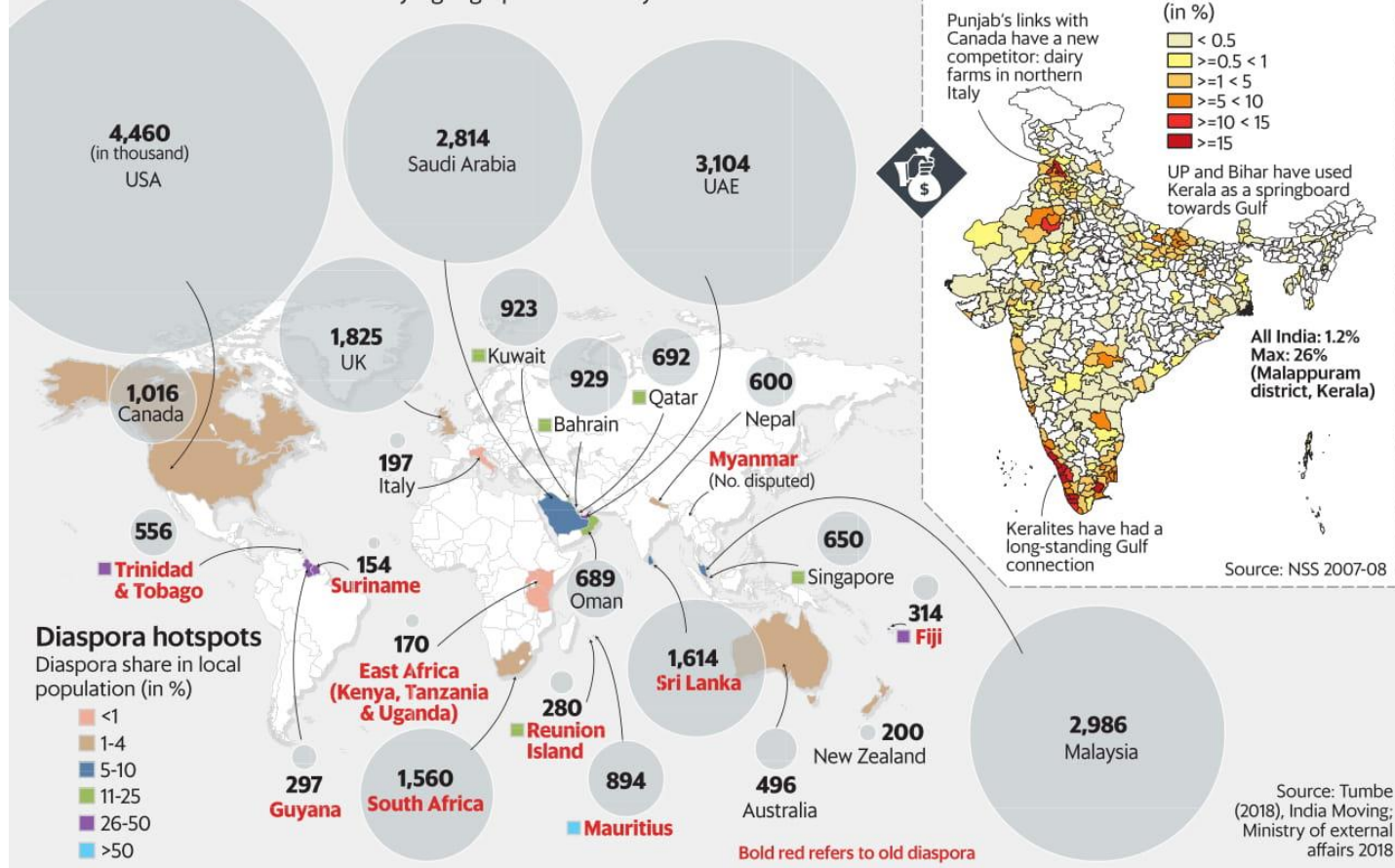
# &

# Out-Migration



# ON THE DESI TRAIL

A mix of old and new migrations have created a 30 million strong network of Indians who live outside the country's geographic boundary



# India Human Development Survey

*Vol. 25, No. 3, 2008*

*Journal of Population Research*

2004-05

2011-12

## **NEGOTIATED IDENTITIES: MALE MIGRATION AND LEFT-BEHIND WIVES IN INDIA**

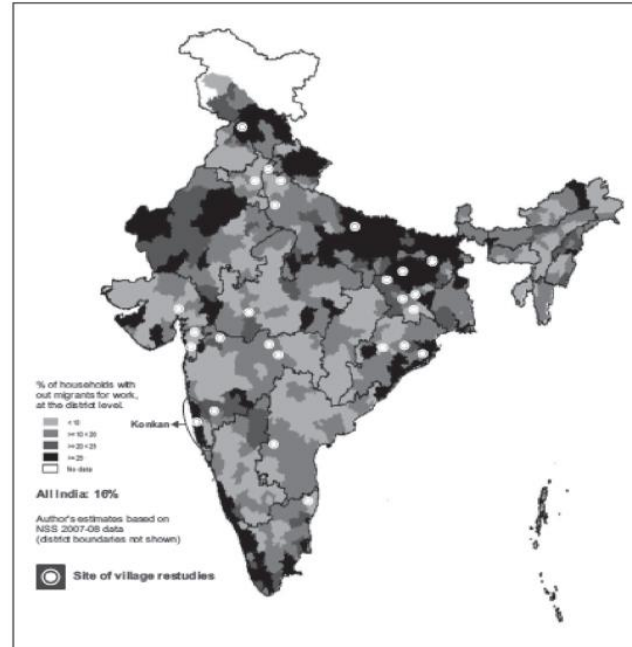
**Sonalde Desai,<sup>†</sup>** University of Maryland  
**Manjitha Banerji,** University of Maryland

This paper examines the impact of husbands' migration on the lives of women left behind. Using data from the India Human Development Survey 2005, we focus on two dimensions of women's lives: women's autonomy and control over their lives; and women's labour force participation. Results suggest that household structure forms the key mediating factor through which husbands' absence affects women. Women not residing in extended families are faced with both higher levels of responsibilities and greater autonomy, while women who live in extended households do not experience these demands or benefits.

# CMIE People of India Database

57	Reason for emigration and immigration (REASON_FOR_EMIGRATION_IMMIGRATION)	✓
58	State from where a member has immigrated or State to which member will emigrate to (EMIGRATED_IMMIGRATED_FROM_TO_STATE)	✓
59	District from where a member has immigrated or district to which member will emigrate to (EMIGRATED_IMMIGRATED_FROM_TO_DISTRICT)	✓
60	Type of region from where a member has immigrated or type of region to which member will emigrate to (EMIGRATED_IMMIGRATED_FROM_TO_REGION_TYPE)	✓
61	Will emigrate in the future (WILL_EMIGRATE)	✓
62	Reason why member wants to emigrate (WILL_EMIGRATE_REASON)	✓
63	Time after which member will emigrate (TIME_TO_EMIGRATE)	✓
64	State to which member will emigrate (WILL_EMIGRATE_STATE)	✓
65	District to which member will emigrate (WILL_EMIGRATE_DISTRICT)	✓
66	Type of region to which member will emigrate (WILL_EMIGRATE_REGION_TYPE)	✓

# Village Re-studies



**Figure 1.** Village Restudy Sites and Outmigration Intensity in India

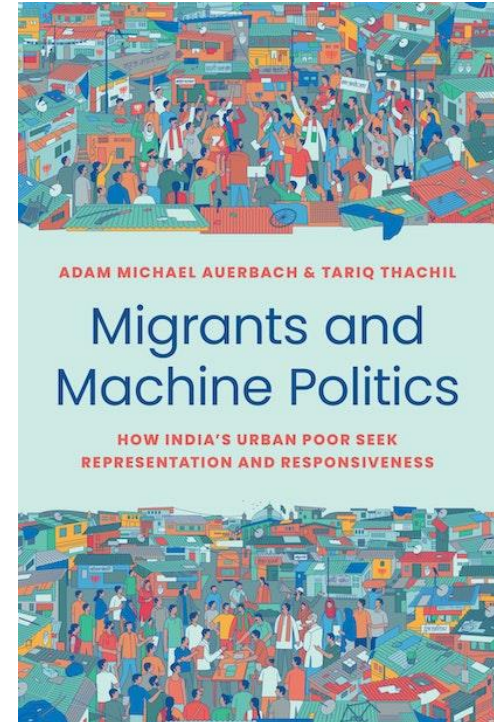
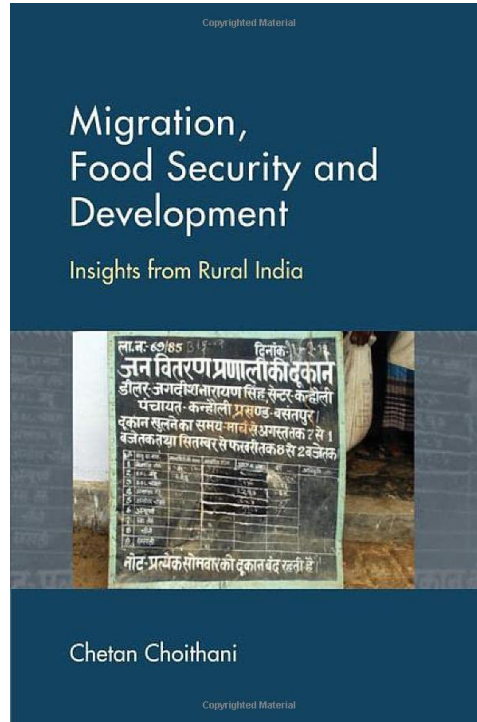
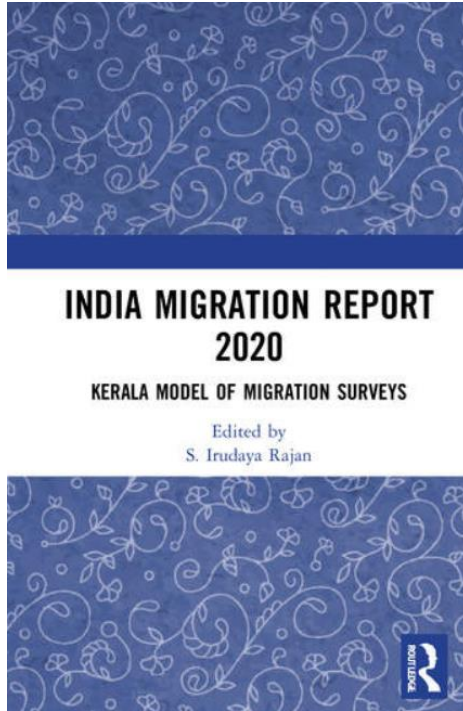
**Source:** Outmigration data for 2007–2008 from Tumbe (2015).

**Notes:** The map depicts the following village restudy sites compiled by Vartak (2018): Mithbhav, Sugaon (proxy name), Shirapur, Kanzara, Dongargaon, (Maharashtra); Gangaikondan (Tamil Nadu); Doaba region (Punjab); Sogur, Bisipara, Ainlatunga; Gandevegim, Chikligim, Sundarana (Gujarat), Jamgod (Madhya Pradesh); Susari, Pokharia, Dubailia Biswaspur, Inai, Baghakole (Bihar); Dokur (Telangana); two villages near Panipat (Haryana); Khanpur, Karimpur, Bijnor, Belapur (proxy name), Palanpur (UP).

**Disclaimer:** This image is for representational purposes only. It may not appear well in print.



# Researcher's migration surveys...





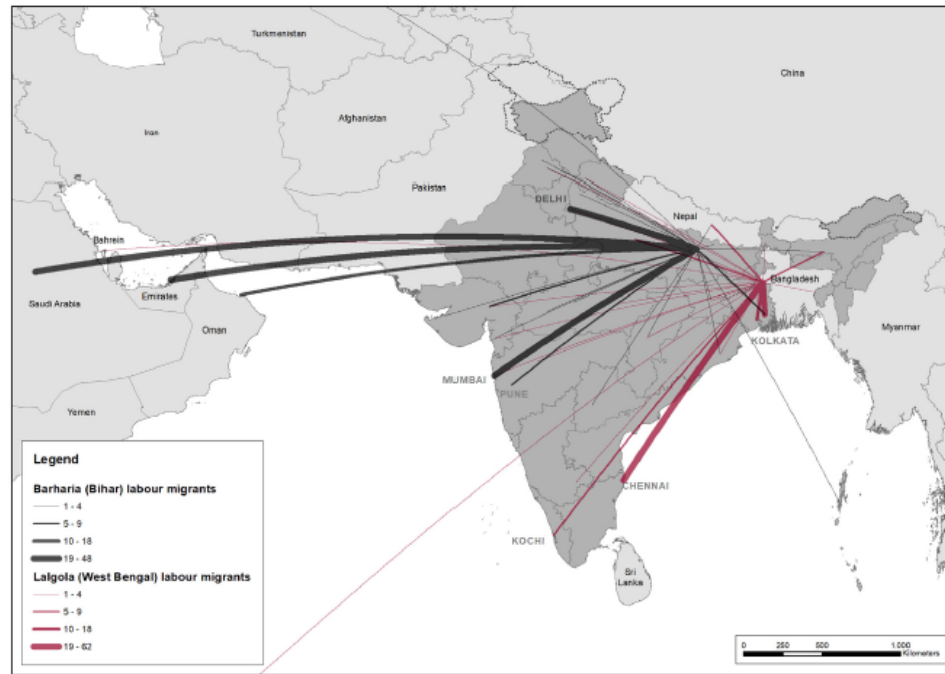


Fig. 7. Labor migration flows from Barharia and Lalgola, 2019; Source: Primary Data 2019; Barharia 216 migrant moves recorded; Lalgola 180 migrants moves recorded.

Table 6

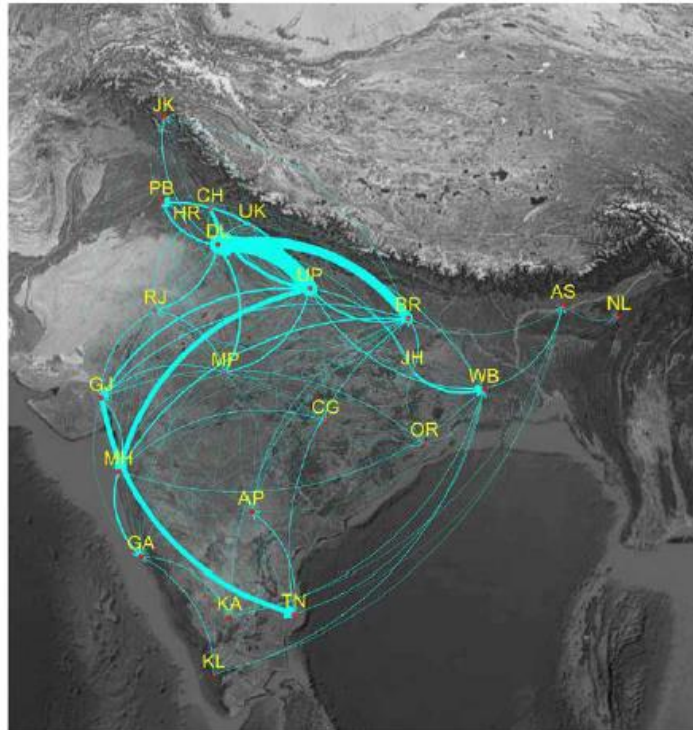
Period of time current migrants have worked away from home, percentage of households, 2019.

	Barharia		Lalgola
	Domestic	International	Domestic
Up to 2 years	34.6%	23.8%	13.8%
2 to 5 years	27.2%	28.8%	14.6%
5 to 10 years	23.5%	30.0%	35.8%
10 to 15 years	8.6%	8.8%	15.4%
15 + years	6.2%	8.8%	20.3%
<b>Number of households (N)</b>	<b>81</b>	<b>80</b>	<b>123</b>

average. Clearly, Barharia's integration in international labor circuits provides it with relatively high remittance incomes.

The importance of international migration is also reflected in Table 8, that differentiates average total incomes among households without migrants, with domestic migrants, and with international migrants. Comparing these three categories of households, it shows that at both sites, households with domestic migrants have the lowest incomes. Household incomes in Lalgola are generally lower than in Barharia, though it should be remembered that household sizes are also smaller in Lalgola, potentially making the difference less acute. Another difference between the two sites lies in the presence of households with international migrants in

Figure 7. Top Inter-State Migration Routes with Highest Passenger Density



districts of Maharashtra. Other counter-magnet region dynamics are observed in Jaipur and Chandigarh (to Delhi).

12.27 While many of the patterns conform to priors, this analysis throws up some real surprises as well. For example, flows from Gujarat to Tamil Nadu are about 7 lakhs annually.

12.28 Figure 8 and Figure 9 show the heat map of the net passenger flows for

FY 2015-16 at state and district level respectively. Gross and net level flows were also calculated at state and district level. The Report by the Working Group on Migration (GoI, 2017) has identified 54 districts with a high level of inter-state out-migration intensity. The net flows calculated using railway passenger traffic correctly identifies 40 of these 54 districts (75 per cent success rate). A similar exercise was done to match the out migrant and in migrant districts

# Transport

Railways data not publicly available

Figure 8: State-wise Heat Map for Passenger Flows in 2015-16

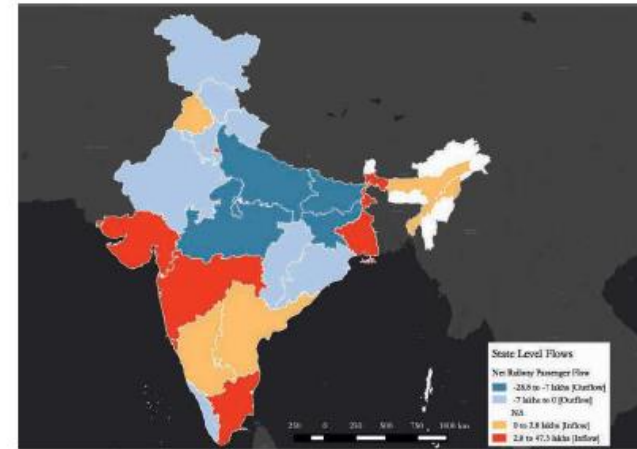
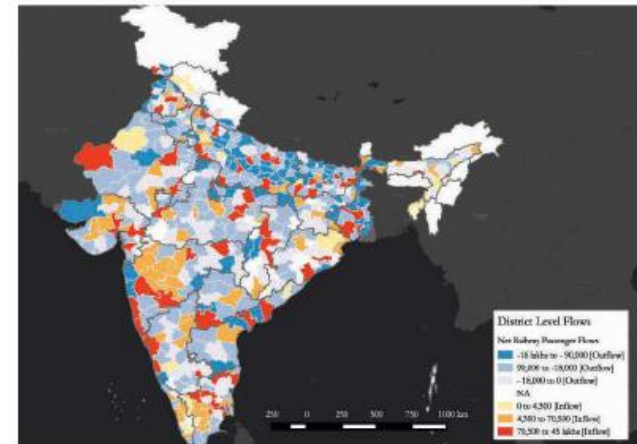


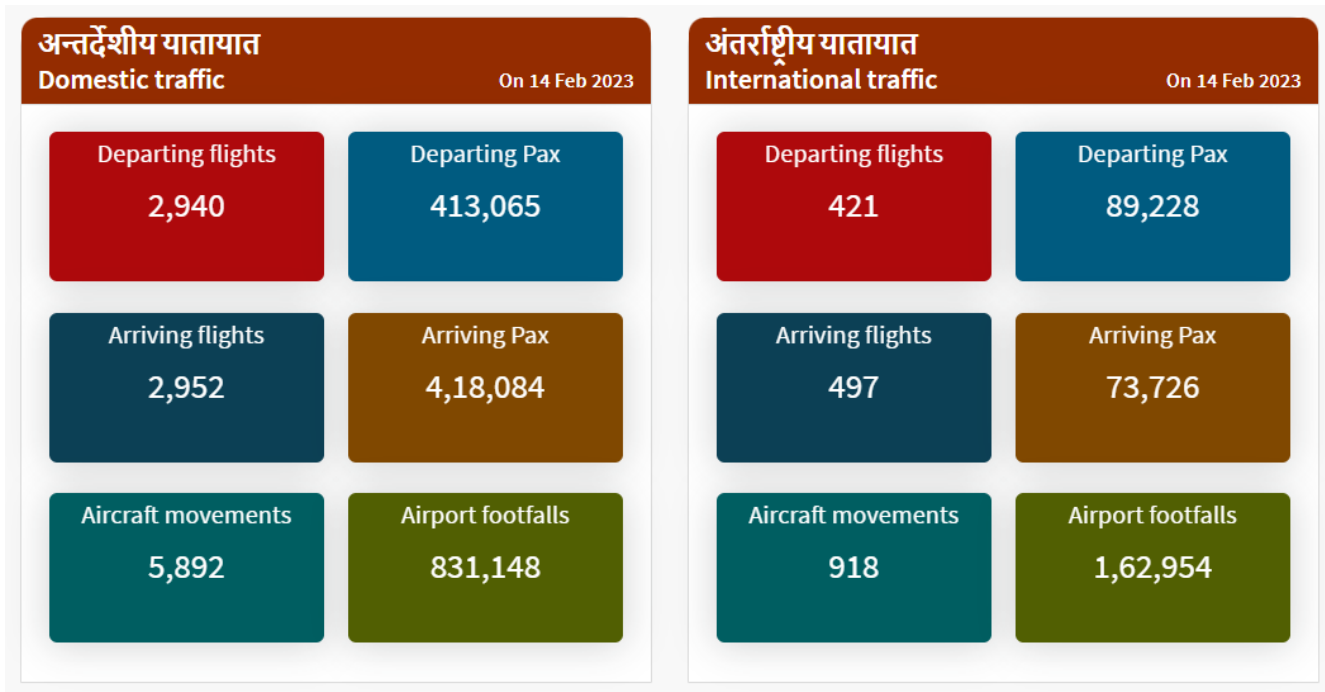
Figure 9: District-wise Heat Map for Passenger Flows in 2015-16



# Increase in International Emigration...



# India's Ministry of Civilian Aviation Website Landing Page



# One Nation One Ration Card Scheme

COMMENTARY

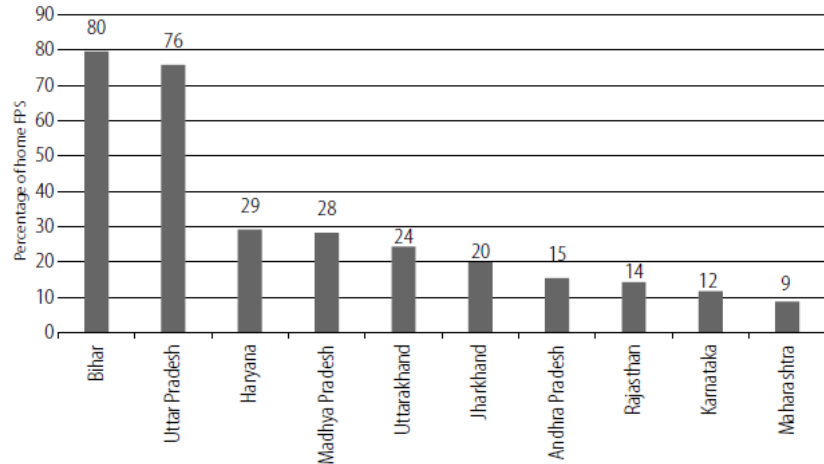
## Food Security for Interstate Migrants An Empirical Analysis of the ONORC

SARTHAK AGRAWAL, ARCHANA AGNIHOTRI

This article uses a newly compiled transaction-level data set on 2 million-plus ration purchases made by interstate migrants to study the One Nation, One Ration Card scheme. The analysis suggests that despite gaining momentum, the initiative may still have some distance to cover. Interstate transactions remain small compared to intra-state sales. Success in implementing and benefiting from the scheme is highly skewed.

From the time we last examined the One Nation One Ration Card (ONORC) scheme (Agrawal and Yadav 2021), it has truly grown by leaps and bounds. All 36 states and union territories have now completed the prerequisites for full portability of food security across the country, with Assam being the latest state to join in June 2022 (PIB 2022a). With India and the world facing a resurgence of food inflation driven by several contemporaneous supply shocks, it is important to assess whether the ONORC programme is proving fit for purpose, especially for migrant workers who suffered severe hardships during the COVID-19 pandemic (Rajan and Bhagat 2022). In this article, we investigate the

Figure 4: Statewise Share of Fair Price Shops Associated with At Least One Outmigrating Ration Card Holder between August 2019 and July 2022



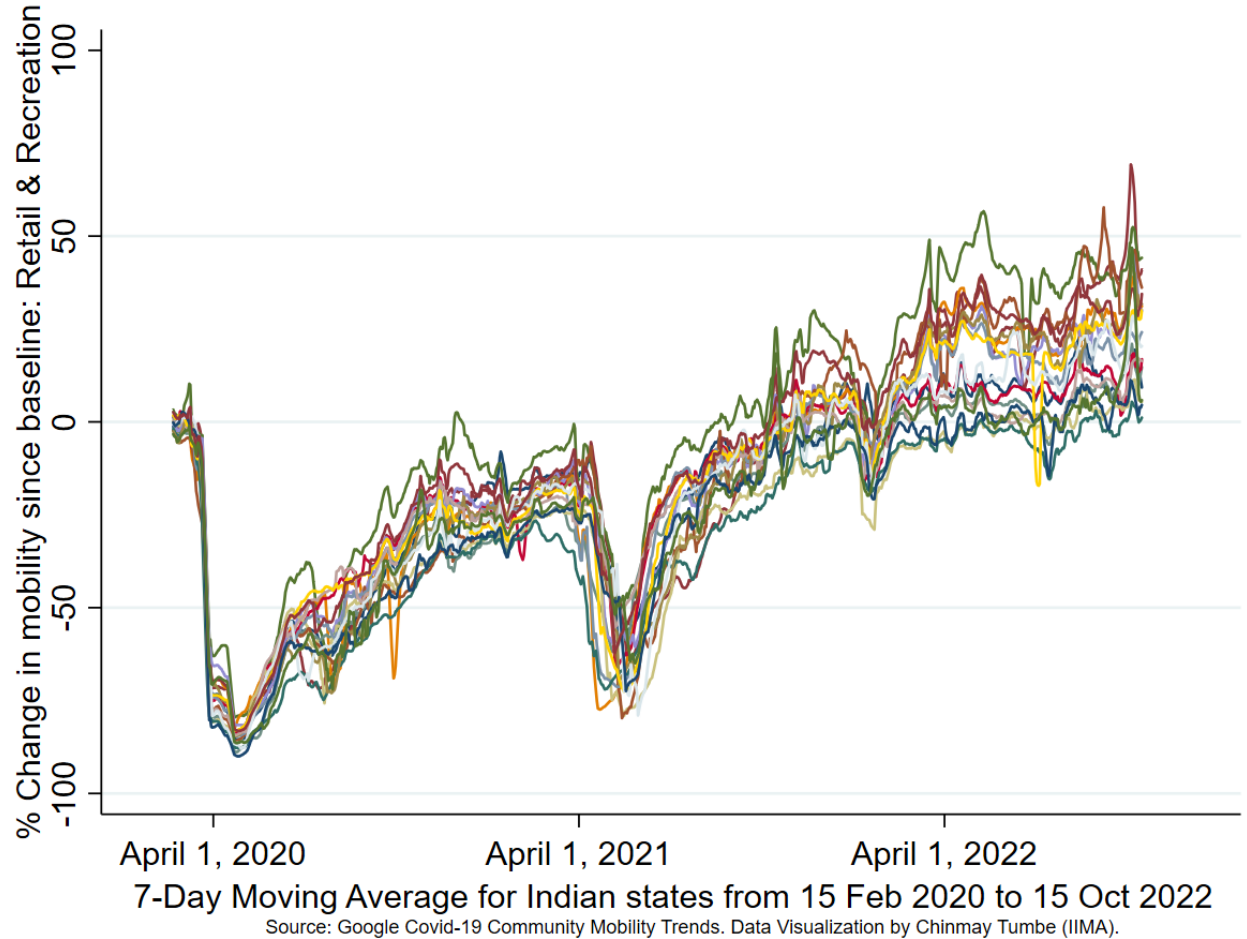
Source: Authors' calculations.

Data on the number of FPS in each state was obtained from the NFSA portal (Fair Price Shops Dashboard [nfsa.gov.in]).

# Google Community Mobility Trends

- Daily data released for 100+ countries using Google's location tags
- From Feb 15, 2020 to Oct 15, 2022
- Across 600+ districts
- Data presented as % change in visitors from pre-pandemic baseline
  - Baseline is median value of Jan 3-Feb 6, 2020, data
- Daily data on 6 categories
  - “Recreation & Retail” category most robust time series with less day-to-day variability
    - Restaurants, Cafes, Shopping Centres, Theme Parks, Museums, Libraries, Movie Theatres
  - Data not presented when sample is too small and hence omits a few districts of India

# Google Mobility Tracker

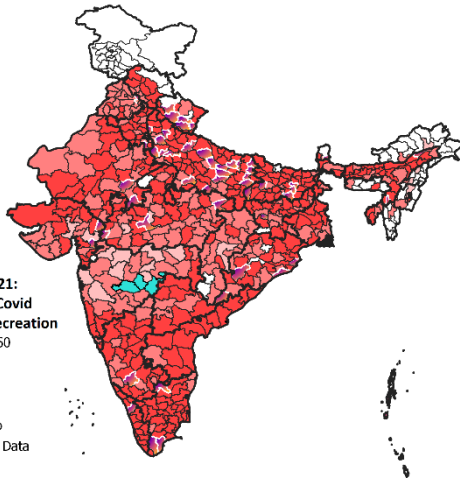




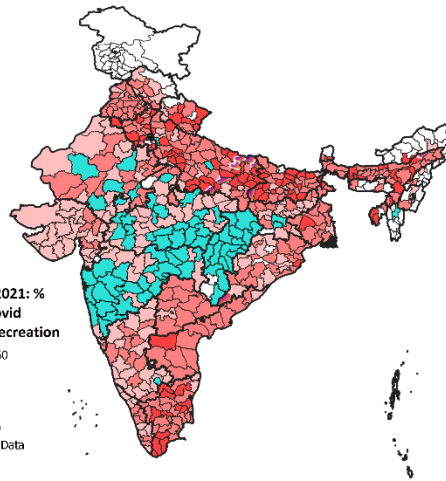
# Tracking lockdowns during the second wave...

## Change in Mobility From April 1, 2021...

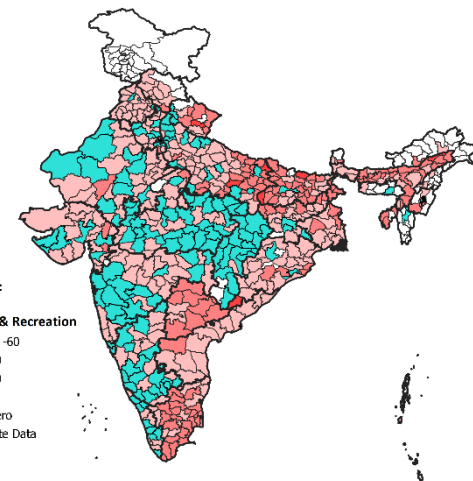
April 1



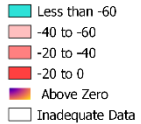
April 27



May 7



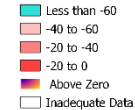
Status on April 1, 2021:  
% Change from Pre-Covid  
Baseline: Retail & Recreation



Status on April 27, 2021: %  
Change from Pre-Covid  
Baseline: Retail & Recreation



Status on May 7, 2021:  
% Change in mobility  
since baseline: Retail & Recreation



Source: Based on Google Community Mobility Data. Seven Day Rolling Average.  
Data visualization by Chinmay Tumbe (IIMA).



## *Food security and human mobility during the Covid-19 lockdown.*

Choudhury, P., Koo, W., LI, X., Kishore, N., Balsari, S., & Khanna, T.(2020).

Harvard Business School Working Paper, No. 20-113.

India's COVID-19 lockdown. Our human mobility data is from the Facebook's Data for Good project (21). Facebook's Data for Good team provides us with access to the GeoInsights portal. This allows us to download mobility datasets generated by an open cohort of individuals who are Facebook users, have smart phones, and are providing information through the Facebook app by having location services enabled. Specifically, the mobility data are aggregated at the location-dyad-day level, containing the number of users moving from one Indian subdistrict to another on a given day. In India, the subdistrict is two administrative levels below the state (see SI for more information on the mobility data). The pre-period consists of March 19-21, 2020. The post-period consists of March 25-April 3, 2020. March 22-24 are omitted to avoid the confounding of the national curfew and period of great uncertainty (see Final Sample sub-section in SI for more detail). In total, our sample contains 219,671 movement observations.

**Usage of  
Facebook Data**

# Mobile Phone Roaming

Research Article

## Interstate Migration in India During the COVID-19 Pandemic: An Analysis Based on Mobile Visitor Location Register and Roaming Data

Journal of South Asian Development  
17(3) 271–296, 2022  
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DOI: 10.1177/09731741221122000  
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278

*Journal of South Asian Development* 17(3)

### Data and Methodology

#### *Data*

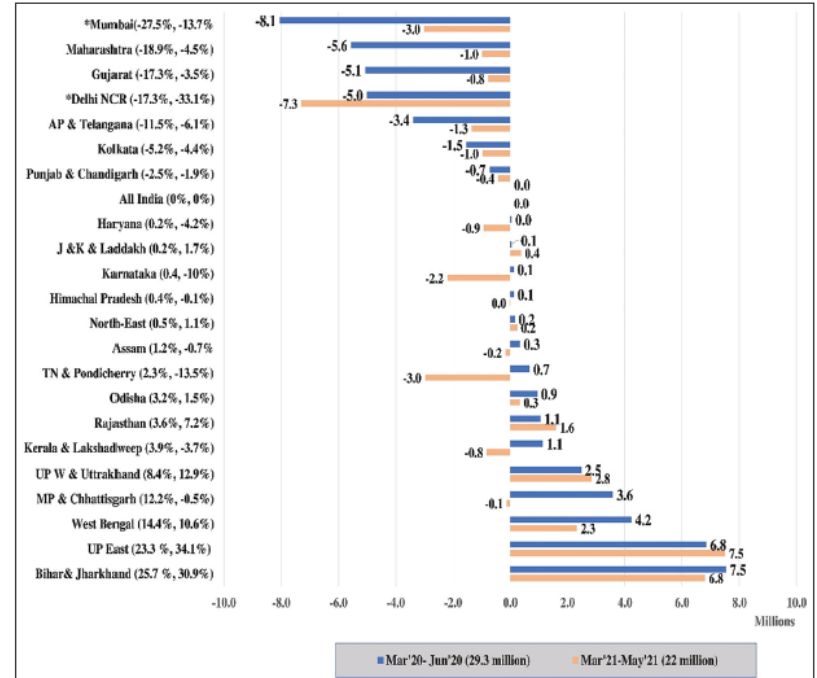
Each month, the telecom market regulator in India TRAI releases subscription data and reports on the telecom sector performance. The data contain the number of subscribers and percentage of active subscribers in VLR in each LSA and at all-India levels (annexures I and II of the subscription reports). The subscription reports are based on reporting of the TSPs data and follow a methodology and definition of calculation prescribed by the Department of Telecommunication (DoT), Government of India, which is mandatory as per licensing agreements (DoT, 2005; TRAI, 2017b). The release of monthly reports is eagerly awaited, widely circulated, scrutinized and discussed in the business media and market, as it provides the growth trajectories of the telecom operators in the Indian market.

Arif Nizam<sup>1</sup>, P. Sivakumar<sup>2</sup> and S. Irudaya Rajan<sup>3</sup>

**Table 2.** Monthly Flow of Interstate Net Reverse and Return Migration in India Before and During the Covid-19.

Months	Net Interstate Migration (+→)	Periods	Total Net Interstate Migration (+→)
Dec'19	62,19,342	<b>Pre Covid-19</b> Months Normal Migration	<b>4,40,44,870</b> (44 million)
Jan'20	34,78,828		
Feb'20	49,05,874		
<b>Mar'20</b>	<b>86,40,375</b>		
<b>Apr'20</b>	<b>96,94,636</b>		
<b>May'20</b>	<b>1,24,08,062</b>		
<b>Jun'20</b>	<b>1,33,01,796</b>		
Jul'20	89,89,923		
Aug'20	57,99,723		
Sep'20	1,23,84,436		
Oct'20	76,60,096		
Nov'20	64,35,832		
Dec'20	70,52,957		
Jan'21	79,22,617		
Feb'21	55,23,344		
<b>Mar'21</b>	<b>53,08,405</b>		
<b>Apr'21</b>	<b>97,85,833</b>		
<b>May'21</b>	<b>1,12,25,849</b>		
Jun'21	1,22,90,714		
Jul'21	1,12,79,961	<b>Unlocks</b> Return back migrations	
Aug'21	45,56,793		
Sep'21	95,98,863		
Oct'21	50,55,073		

Source: Authors' analysis based on TRAI data.



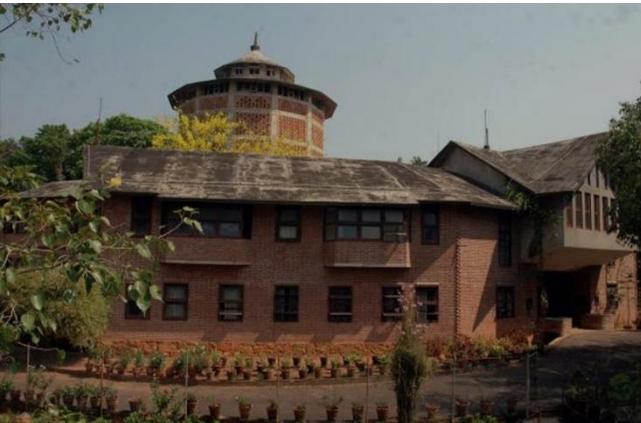
**Figure 1.** Two Waves of COVID-19 Lockdowns and Interstate Reverse Migration in India (in Million).

Source: Authors' analysis based on TRAI data.

\*Note: Mumbai metro LSA includes Navi Mumbai, Kalyan and parts of Thane districts and having total active subscriber base of 28 million in February 2020. Delhi-NCR includes Gurugram, Faridabad, Noida and Ghaziabad also having active subscriber base of 41 million in February 2020. West Bengal includes states of Sikkim and UT of A&N, Northeast includes states of Arunachal Pradesh, Nagaland, Manipur, Meghalaya, Mizoram and Tripura. Maharashtra includes the state of Goa.

# Migration data can turn up anywhere...

*Towards financial inclusion / 419*

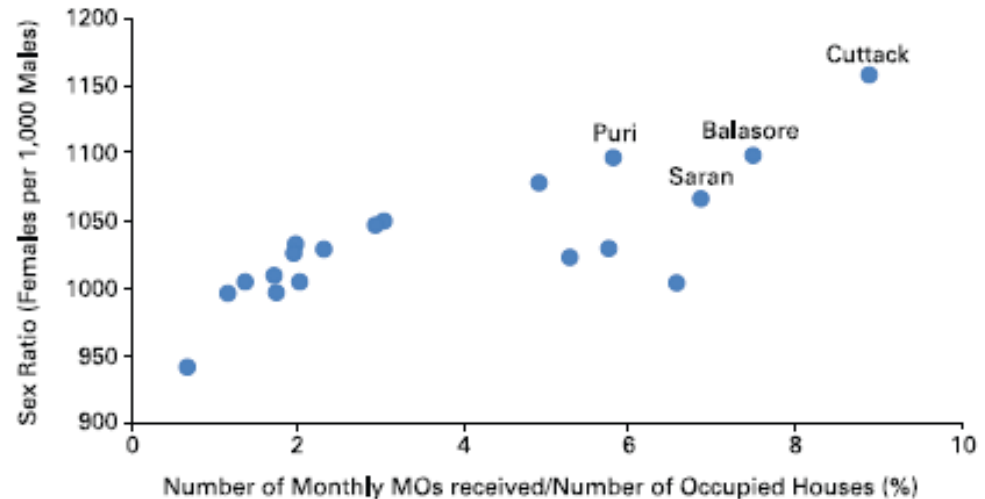


CDS, Thiruvananthapuram

Source: Tumbe, C. 2015. "Towards Financial Inclusion: The post office of India as a financial institution, 1880-2010", *Indian Economic and Social History Review*, 52 (4), 409-437

**Figure 1**

Outmigration and MO Remittance Inflow in Bihar and Orissa, c. 1920



**Source:** Gol, Census of India, Vol. VII, Bihar and Orissa, Part 1, 1921, p. 107 for data on MOs and Part 2 for information on population and occupied houses.

**Notes:** Monthly MOs refer to average number of monthly MOs paid in the district between years 1915 and 1920. Sex ratios used as proxies for male-dominated outmigration.

# Resources for the student

*Resource page on my Googlesite*

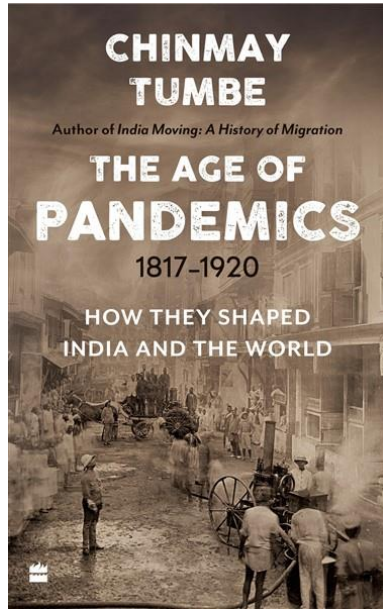
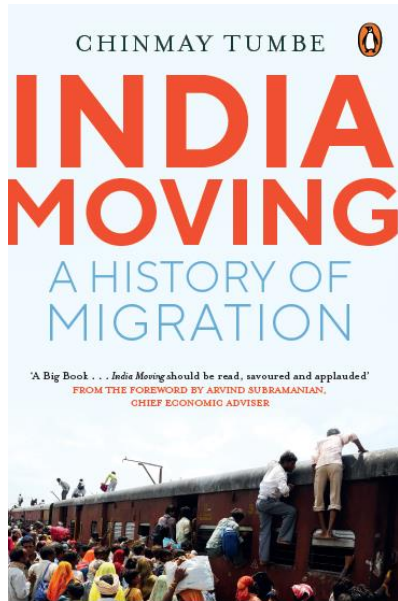
*India Migration Bibliography (2012)*

- Freely available online
- 3000+ studies on Indian migration

Movie

- Gaman (1978)

# Thank You



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***IIMA's History Internship***