MAPPING DEMOGRAPHY AND HEALTH IN DISTRICTS OF INDIA

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INTRODUCTION

❑ Population aged 60 years and above in 2011 account **104 million** in India compared to 58 million in USA, 39 million in Japan and 168 million in China

❑ The average annual growth rate of overall population in India was 1.63% (2001-11) compared to **3.04%** of elderly (60+) population.

❑ The national average in changing age-structure conceals large variation across states and districts of India.

❑ While 53 of 640 districts have estimated TFR of **below 1.6**, 43 districts have TFR of more than 4.

❑ Falling fertility and increased longevity is associated with increasing morbidity, disability and household health spending.

❑ With falling/no income, lack of social security and deteriorating health, the household resorts to catastrophic health spending.

OBJECTIVE

❑ To examine the variation in age structure, potential support ratio, disability and the household health spending in districts of India

❑ To understand the association of population ageing, disability and household health spending in districts of India

RESEARCH QUESTION

❑ To what extent the population ageing is associated with disability (movement, speeches, seeing, hearing, mental retardation, mental illness, and multiple disabilities)

❑ Does population ageing associated with increased household health spending in India?

HYPOTHESIS

❑ Districts with higher proportion of elderly population, exhibit higher disability

❑ Districts with higher proportion of elderly population has higher health spending

DATA AND METHODS

1. Census of India, 2001 and 2011
2. National Sample Survey 2009-10 and 2011-12

Unit of Analyses: District (640)

Dependent variables: Disability, Percapita Household Health Spending

Methods: Descriptive Statistics; OLS

Questions on disability canvassed in Census of India, 2011

- Is this person mentally/ physically disabled?
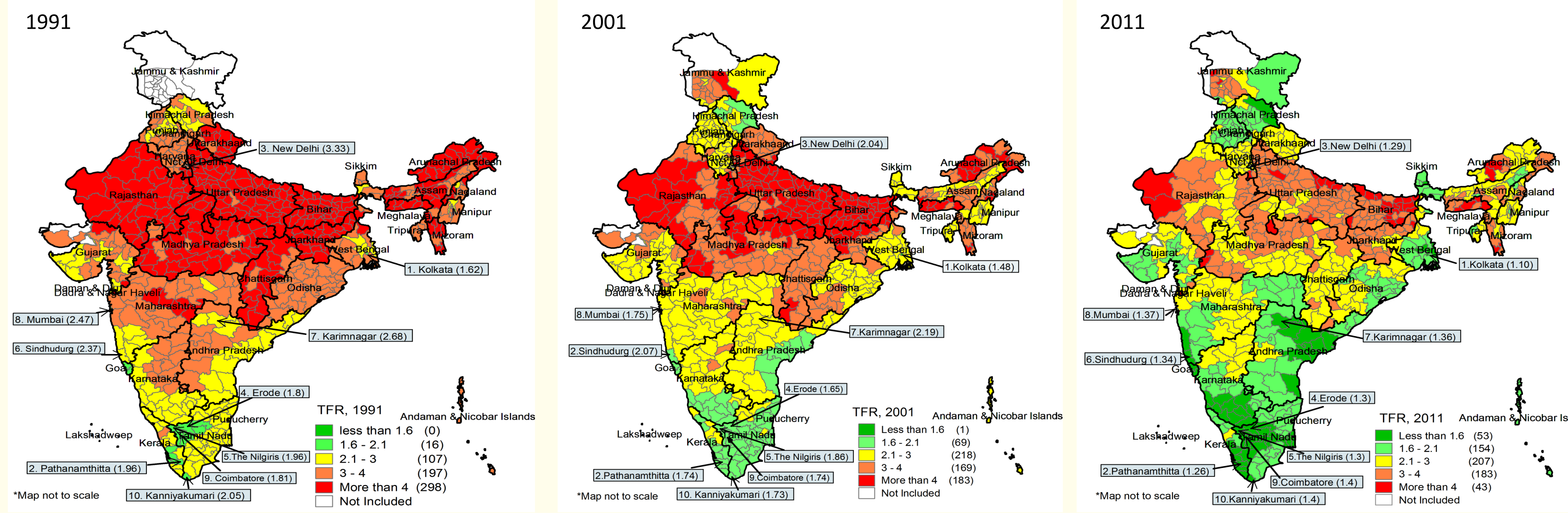 Response: Yes/ No
- If yes, give a code

  Disability
  In seeing...........1   Mental retardation....5
  In Hearing.........2   Mental illness 6
  In Speech 3   Any other 7
  In movement ..4   Multiple disability...8

- If "Multiple disability", as many as three types of disabilities are recorded

Results

Figure 1: Total Fertility Rate (TFR) in districts of India, 1991, 2001, and 2011
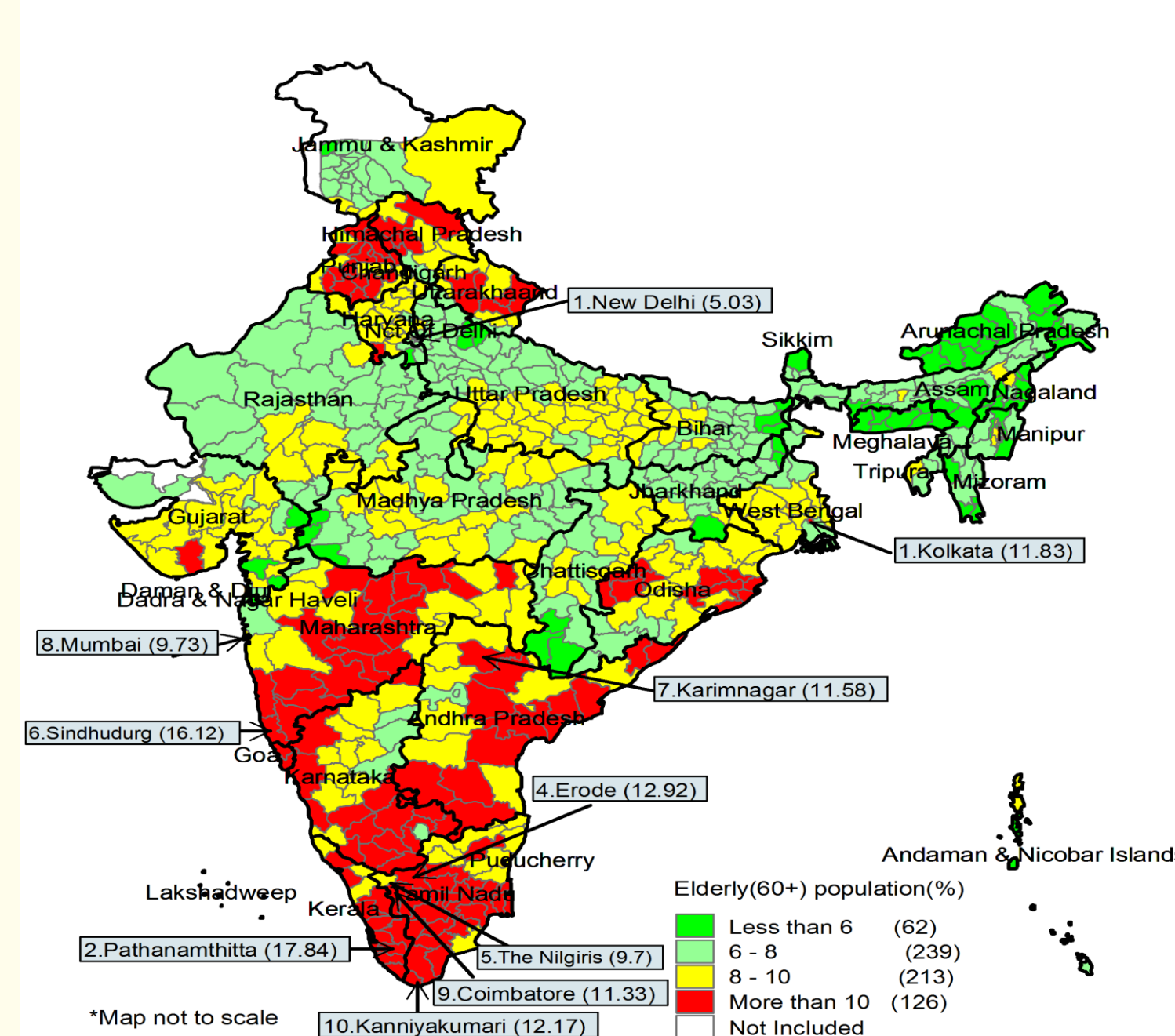

Fertility transition in second decade (2001-11) was faster compared to first decade (1991-2001). About one-third of districts has reached below replacement level of fertility by 2011.

Defining Indian Districts
❑ Districts in India are the basic administrative unit for planning and program implementation.
❑ By 2011, there were 640 districts over 35 states and union-territories in India.
❑ The average population of a district is about two million.
❑ Indian districts exhibit enormous variation in socio-economic development and are at varying stages of demographic transition.
❑ While district level information is most sought for planners and policy makers, it is the most daunting task for researchers

Figure 2: Share of elderly (60+) population in Districts of India, 2011

❑ Increasing share of elderly population and declining support ratio is taking place cutting across geographical boundaries.

❑ The share of 60 + population was 18% in *Pathanamthitta* district of Kerala, 16% in *Sindhudurg* district of Maharashtra, 12% in *Kolkata* district of West Bengal compared to 8.6% of national average and 12% in China and 19% USA .

Figure 3: Potential support ratio in districts of India, 2011
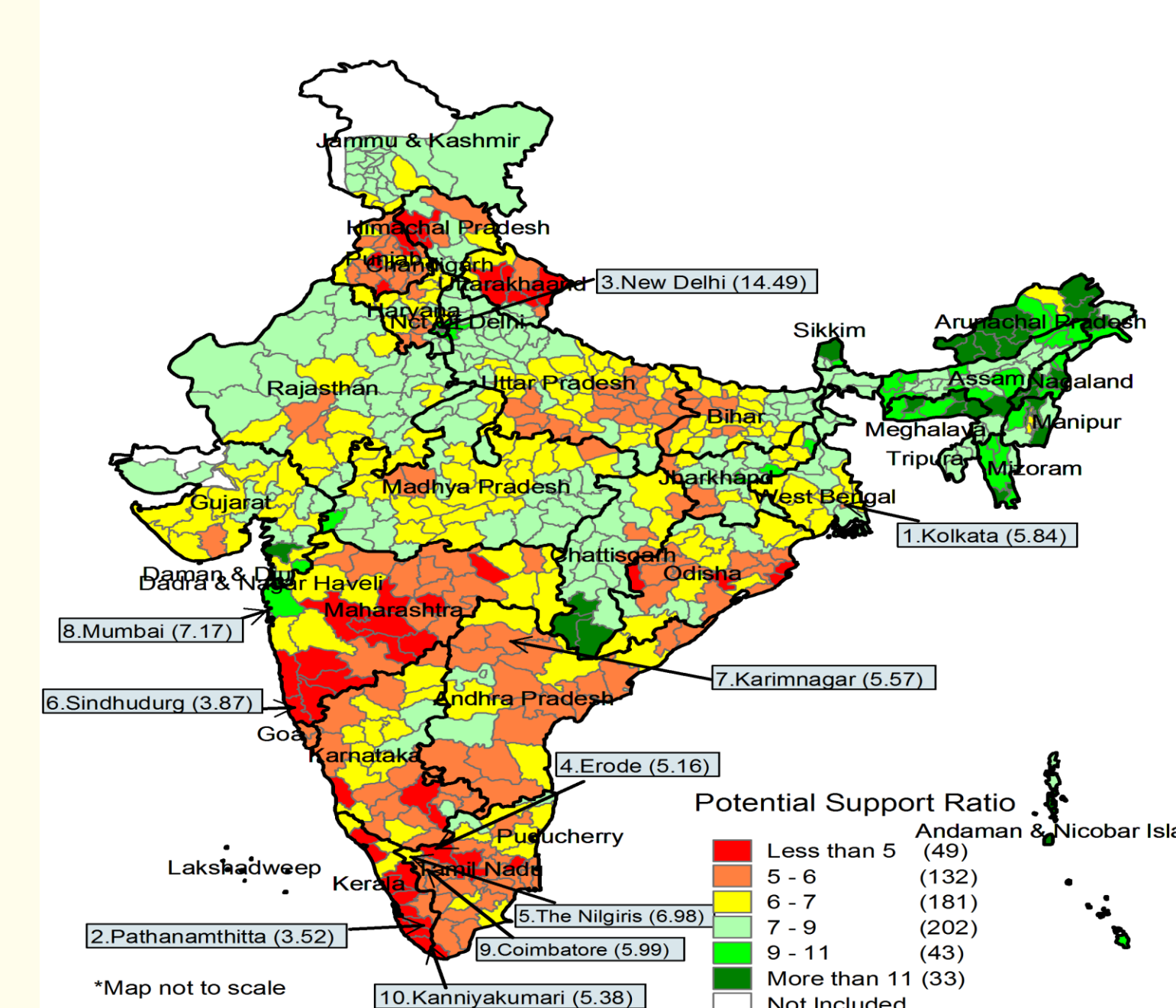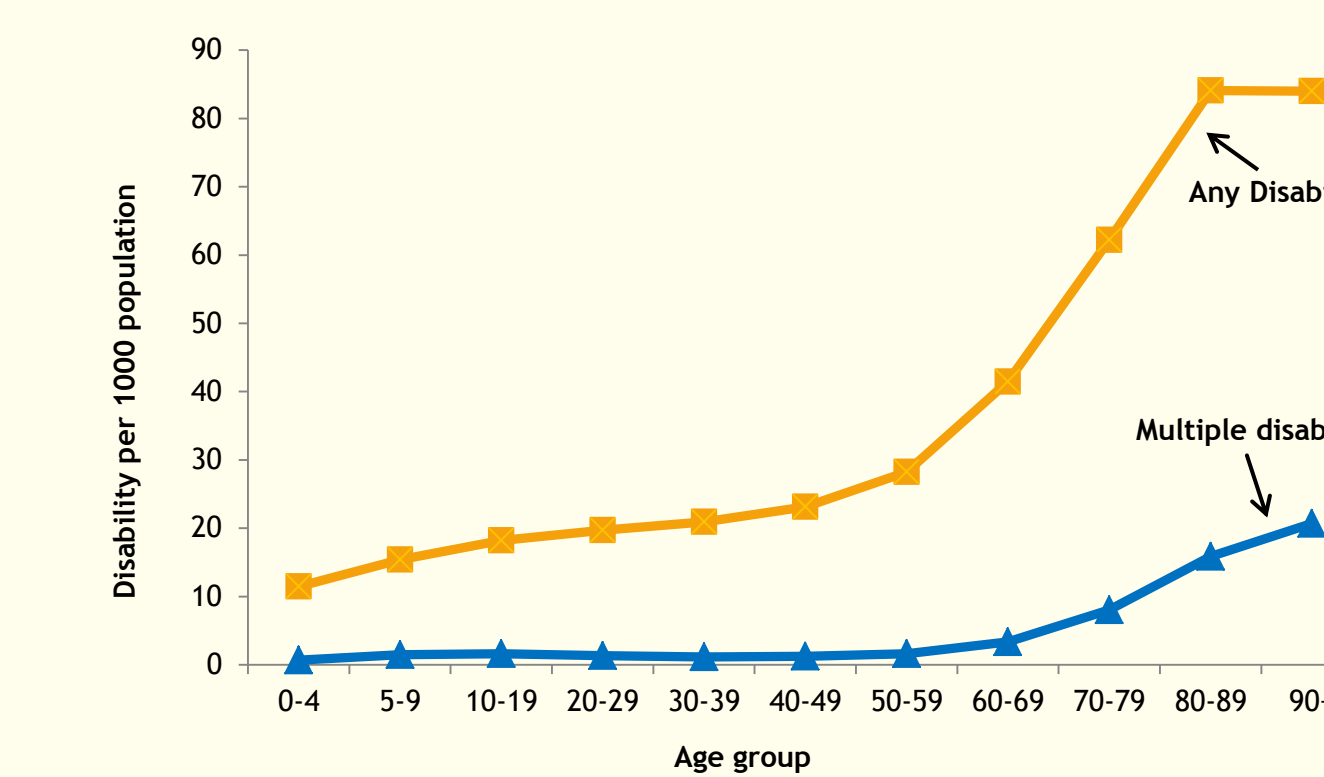

Table 1: Potential support ratio, TFR, type of disability, per-capita consumption expenditure and health spending by 60+ population in India, 2011

Percentage 60+	Potential support ratio	TFR	Disability (per 1000 population)							Annual percapita health spending			Annual per-capita consumption expenditure	Health expenditure as % of consumption expenditure	Number of districts
			Any disability	Multiple disability	Movement	Speeches	Mental retardation	Mental Illness	Seeing	Hearing	Non-institutional + institutional	Institutional health spending	Non-institutional health spending			
5	12.55	3.05	14.74	1.16	2.51	0.88	0.75	0.48	2.89	3.35	671	415	256	20100	3.3	40
6	9.21	3.43	19.32	1.48	3.46	1.24	0.93	0.49	3.59	4.43	785	568	217	16474	4.8	67
7	8.22	3.19	21.35	1.64	4.04	1.59	1.03	0.50	4.20	4.38	879	627	252	16942	5.2	122
8	7.44	2.85	22.82	1.70	4.38	1.39	1.16	0.57	4.76	4.58	1079	714	365	17538	6.2	143
9	6.80	2.45	21.98	1.71	4.51	1.60	1.26	0.59	3.97	4.11	1103	769	334	17377	6.3	102
10	6.44	1.83	22.82	1.91	5.11	2.07	1.51	0.62	4.04	3.90	1324	953	371	19697	6.7	68
11	5.84	1.76	22.82	1.96	5.66	2.01	1.57	0.59	3.81	3.50	1382	900	482	19222	7.2	49
12	5.09	1.63	24.23	2.24	5.29	2.40	1.73	1.09	3.92	3.68	2189	1274	915	24669	8.9	49
Total	7.28	2.60	22.15	1.75	4.49	1.65	1.24	0.60	4.16	4.19	1146	774	373	18235	6.3	640

❑ Increasing share of elderly population is associated with higher disability and higher health spending.
❑ Average health spending in districts with 12% of elderly population is 4 times higher than the districts with 5% elderly population.
❑ All form of disability such as movement, speeches, mental retardation, mental illness and seeing are significantly higher with average increase in elderly population

Figure 4: Any disability and multiple disabilities (per 1000 population) by age in India, 2011

While any form of disability remains similar till age 50, it increases at increasing rate beyond age 50 indicating that elderly population are vulnerable to disability.

On the other hand the elderly population are highly vulnerable to disability in seeing, hearing and movement.

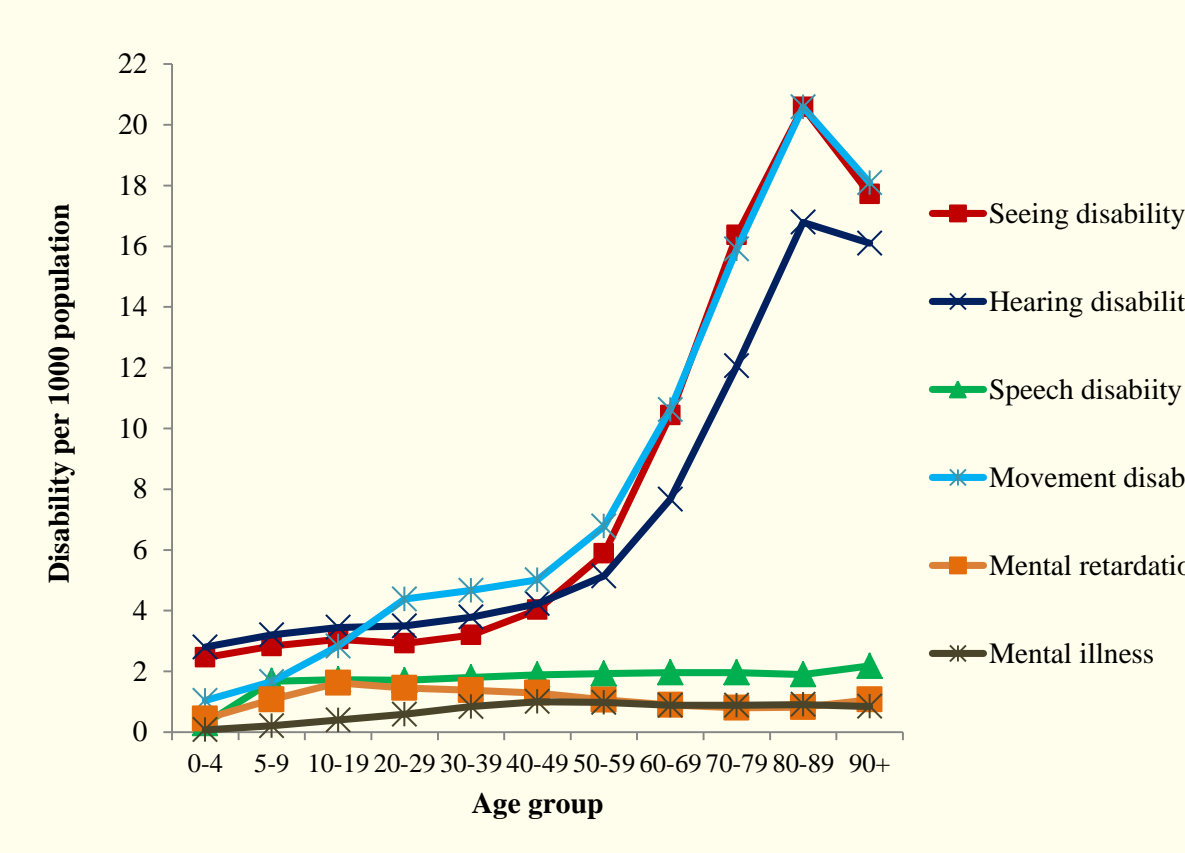## Figure 5: Type of disability (per 1000 population) in India, 2011

Table 2: Determinants of percapita household health spending: Association of percapita household health spending, age structure, disability and other covariates

Covariates	Coefficient	SE	t	P>t	95% Confidence Interval
Percentage of elderly population (60+)	**0.093**	0.033	2.810	0.005	0.028 - 0.158
Percentage of adult (15-59) population	0.021	0.016	1.320	0.186	-0.010 - 0.052
Percentage of total disabled population	0.005	0.004	1.380	0.168	-0.002 - 0.012
Percentage of urbanization	0.006	0.002	3.520	0.000	0.002 - 0.009
Female literacy rate	-0.004	0.002	-1.490	0.136	-0.009 - 0.001
Wealth index score	0.020	0.003	7.330	0.000	0.015 - 0.025
Potential support ratio	-0.102	0.033	-3.080	0.002	-0.167 - -0.037
Total fertility rate (TFR)	0.135	0.090	1.500	0.134	-0.042 - 0.311
Constant	1.918	1.221	1.570	0.117	-0.480 - 4.315
	R2= 0.508				
	N=621				

Table 3: Determinants of disability: Association of disability and age structure in India, 2011

Covariates	Coefficient	SE	t	P>t	95% Confidence Interval
Percentage of elderly population (60+)	**0.673**	0.328	2.050	0.040	0.029 - 1.318
Percentage of adult (15-59) population	0.192	0.081	2.380	0.018	0.034 - 0.350
Female literacy rate	-0.127	0.026	-4.850	0.000	-0.179 - -0.076
Wealth index score	-0.059	0.028	-2.110	0.036	-0.114 - -0.004
Potential support ratio	-0.341	0.361	-0.940	0.345	-1.049 - 0.368
Percentage of urbanization	0.024	0.017	1.450	0.148	-0.009 - 0.057
Constant	16.266	4.336	3.750	0.000	7.751 -24.781
	R2= 0.114				
	N=640				

Increase in percapita household health spending is significantly associated with increase in elderly population.

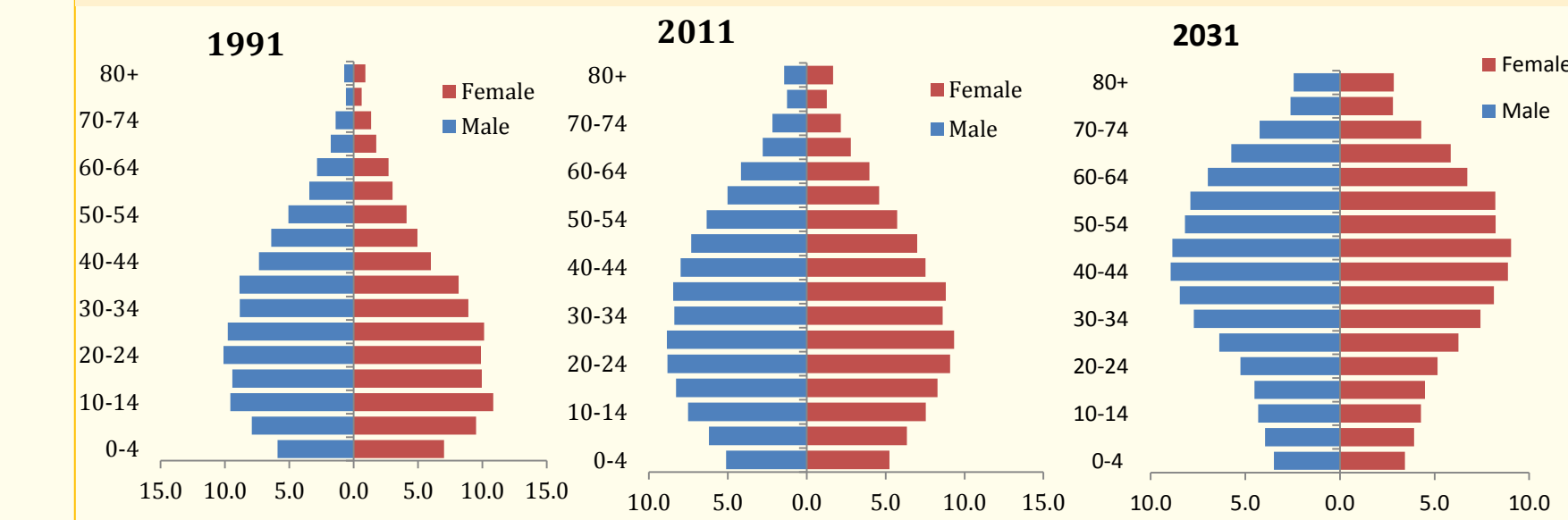## Figure 6: Age, Sex Pyramid of Kolkata district, 1991- 2031

Figure 7: Age, Sex Pyramid of Pathanamthitta district , 1991- 2031
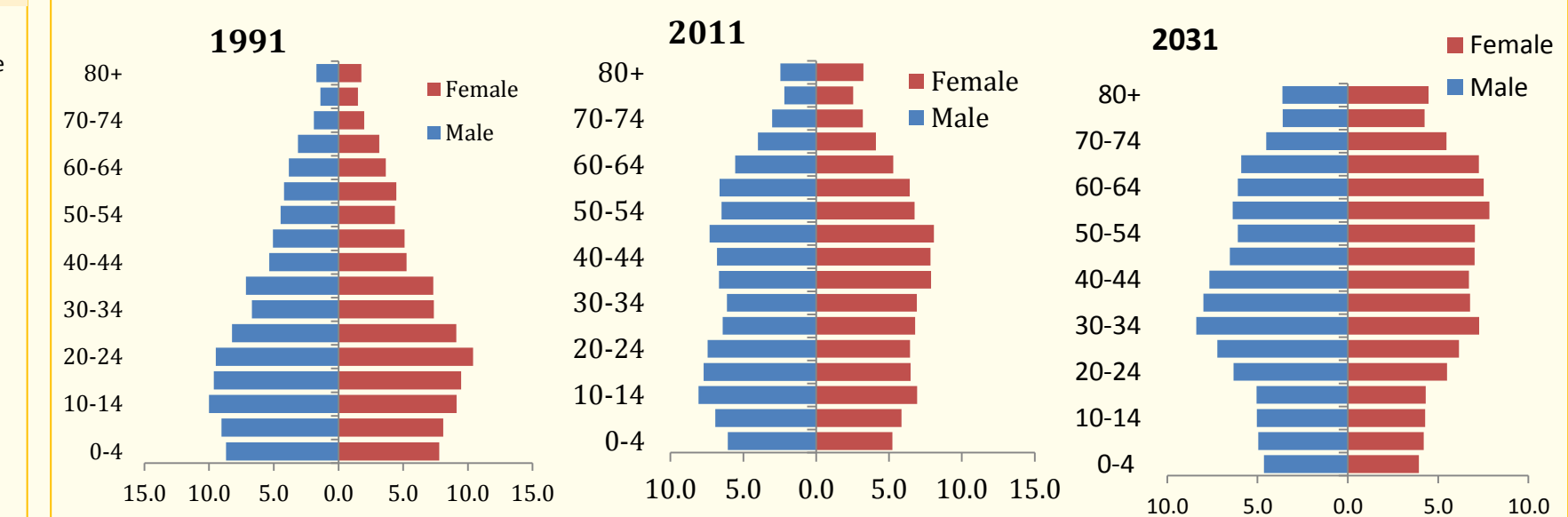

Figure 8: Age, Sex Pyramid of Sindhudurg district, 1991- 2031
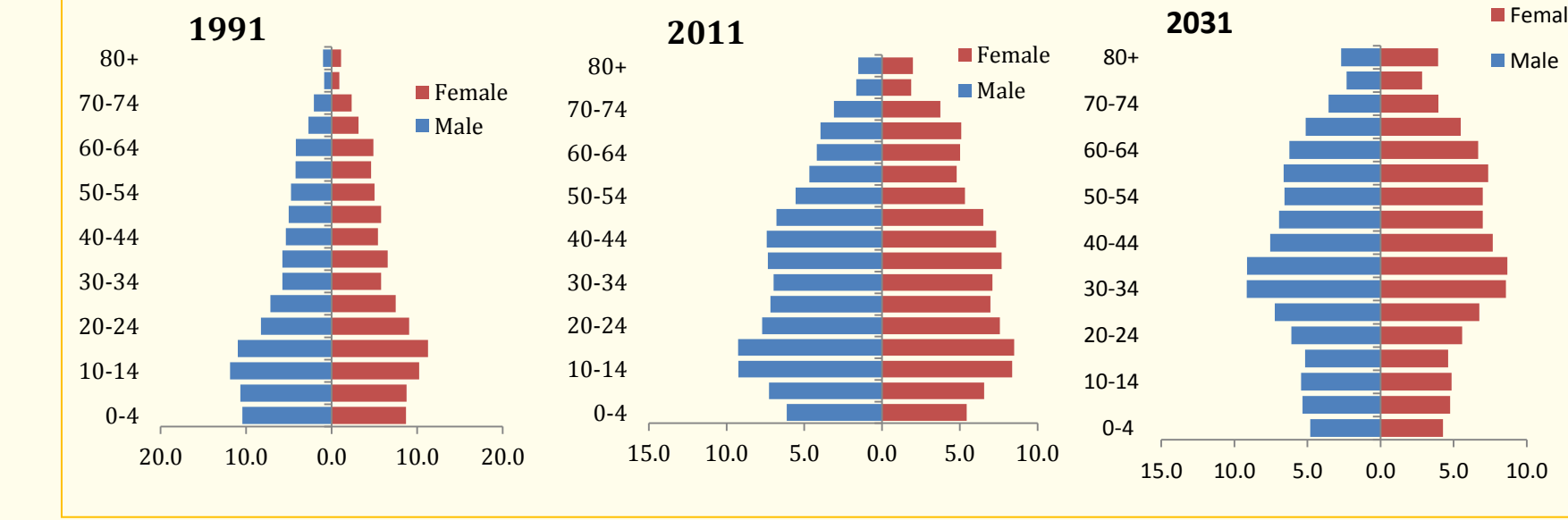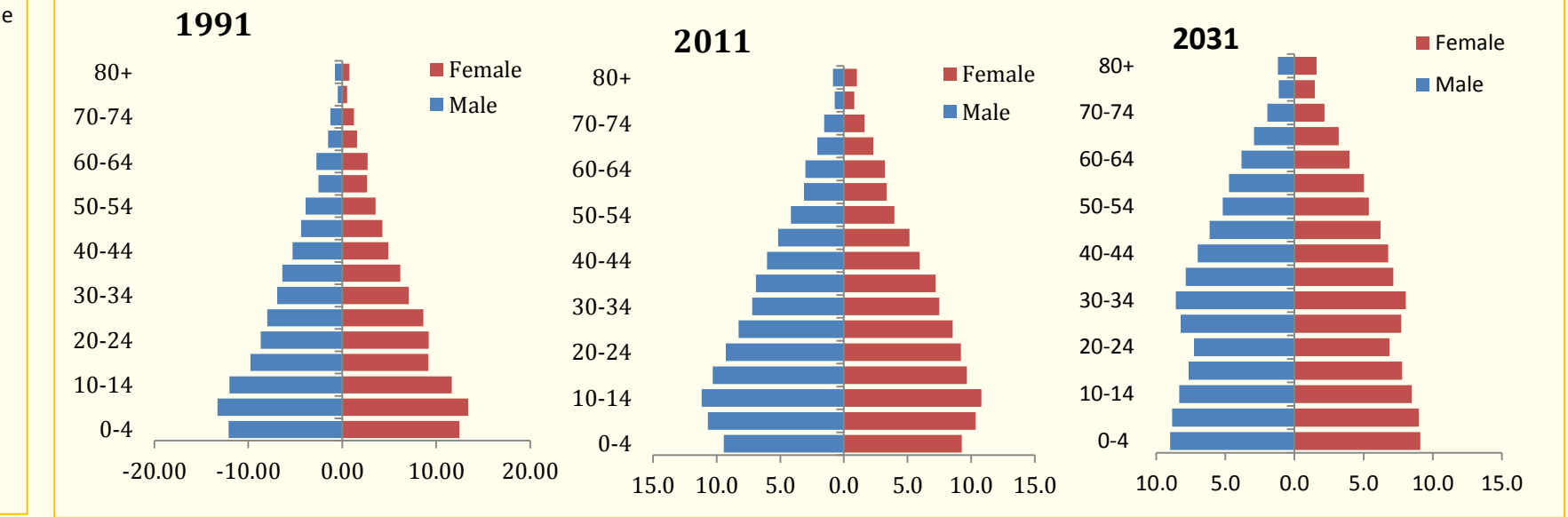

Figure 9: Age, Sex Pyramid of India: 1991- 2031

Table 4: Population growth rate and female literacy rate in 10 districts of India, 2011

District	State	Population Size			Annual exponential growth rate		Annual growth rate of 60+ population	% of Female Literacy		
		1991	2001	2011	1991-2001	2001-11	2001-11	1991	2001	2011
Kolkata	West Bengal	4399819	4572876	4496694	0.39	-0.17	1.56	72.09	77.95	84.06
Pathanamthitta	Kerala	1188382	1234016	1197412	0.38	-0.30	1.70	93.29	93.71	95.83
New Delhi	Delhi	168671.3	179112	142004	0.6	-2.32	0.02	66.99	74.64	83.56
Erode	Tamil Nadu	1802939	2016582	2251744	1.12	1.1	NC	41.58	55.26	64.71
The Nilgiris	Tamil Nadu	710223	762141	735394	0.71	-0.36	3.31	61.47	73.39	78.98
Sindhudurga	Maharashtra	832152	868825	849651	0.43	-0.22	1.81	66.87	71.67	79.81
Karimnagar	Andhra Pradesh	3037424	3491822	3776269	1.39	0.78	3.21	23.37	44.19	54.79
Mumbai	Maharashtra	3174889	3338031	3085411	0.5	-0.79	1.50	75.8	82.71	86.45
Coimbatore	Tamil Nadu	2493715	2916620	3458045	1.57	1.7	NC	55.73	69.8	78.92
Kanniyakumari	Tamil Nadu	1600338	1676034	1870634	0.46	1.1	3.25	78.39	85.38	89.9
India		846418816	1028737436	1210193422	1.95	1.62	3.04	39.29	54.03	64.64

NC (Not computed): Tiruppur district was created during 2001 - 2011from Coimbatore and Erode district

Definition of Disability:

Any disability: If a person is mentally/physically disabled
In seeing: If a person has blurred vision
In speech: Persons who speak in single words and are not able to speak in sentences
In hearing: Persons using hearing aids

Movement: paralytic person, those who crawl, walk with the help of aid, problems of joints/muscles, stiffness in movement, difficulty in balancing body movement, have loss of sensation due to paralysis, have deformative of body
Mental retardation: Intellectual disability/ cognitive disability and intelligence
Mental illness: Any form of psychiatry condition characterized by impairment of cognitive, emotional and behavioural functioning caused by psychological and physiological factors
Multiple disability: A person reported as many as three types of disabilities