

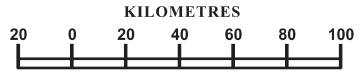
Demography, Health and Nutrition



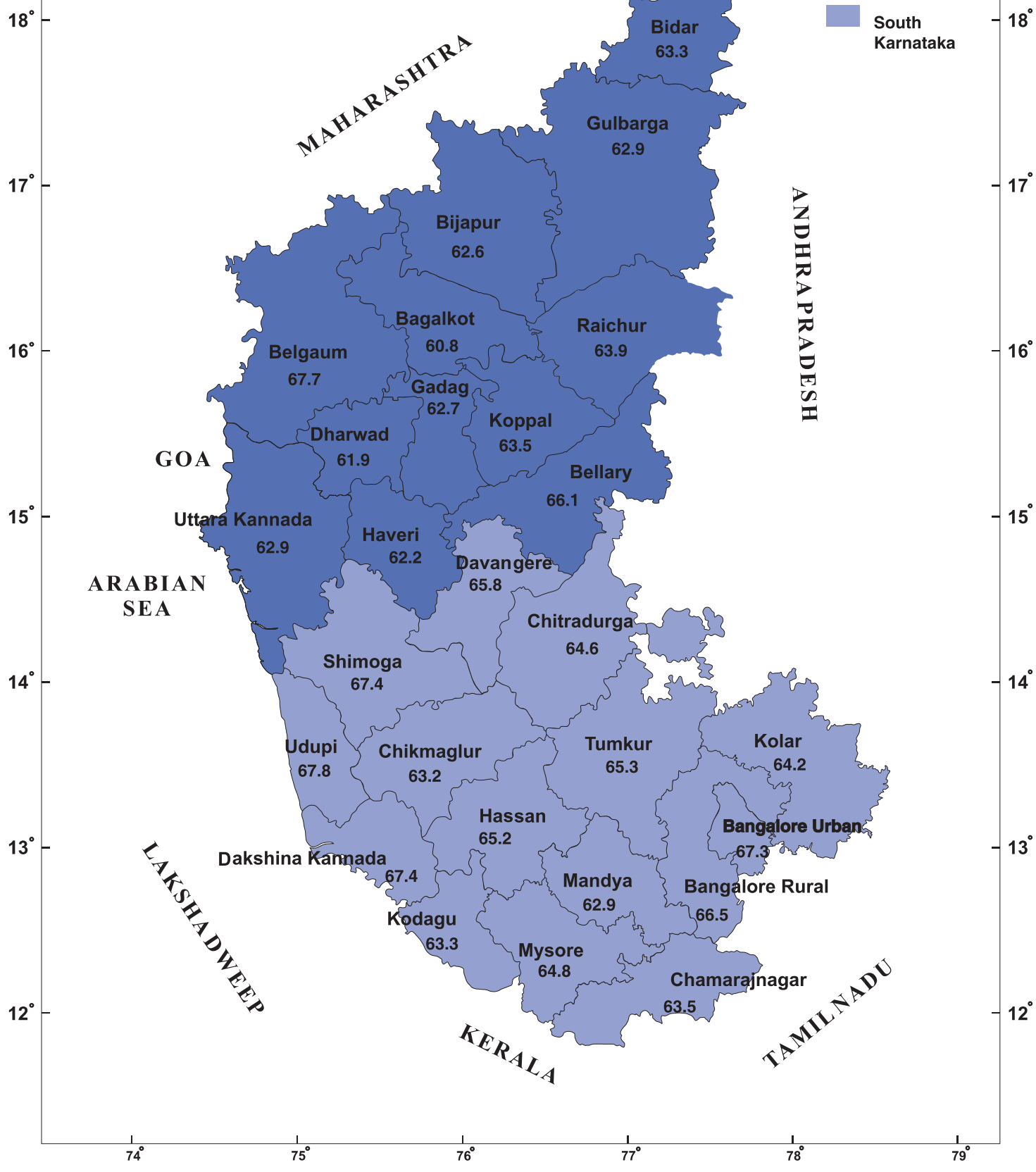
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KARNATAKA

Life Expectancy at Birth 2001-02



- North Karnataka
- South Karnataka



Demography, Health and Nutrition

Introduction

Good health is an invaluable asset for better economic productivity, both at the individual and national level, but above all, it is valued by those who own it as a prerequisite for a better quality of life and better standards of living. Sub-populations who are at the highest risk from poor health and its effects on longevity and morbidity are the poor, women, the Scheduled Castes and Scheduled Tribes. The main reasons for the high level of vulnerability of these sub-groups are, first, the inaccessibility of healthcare, and second, their inability to spend on healthcare interventions. Public healthcare systems must, therefore, provide that critical barrier between ill-health and the ones who are most vulnerable, but here too, factors such as financing and efficiency greatly influence the quality and coverage of public healthcare services.

The health scenario in Karnataka today is a combination of achievements and challenges. Significant advances have taken place in health and healthcare services over the past decade. A brief review of the key demographic indicators that offer a reliable overview of the status of health in Karnataka suggest that the state's performance is much better than the all-India average. The state's population increased from 4.49 crore in 1991 to 5.27 crore in 2001. A comparison of the decadal growth of population shows a significant decline from 21 per cent between 1981-91 to 17.5 per cent in 1991-2001. Life expectancy at birth has increased to about 66 years in 2001. Infant and maternal mortality are among the most reliable indicators for assessing health status, and Karnataka's performance here, as in reducing neonatal mortality, child mortality and maternal mortality rates – all of which show a downward trend – is better than the aggregated figures for the whole of India (Table 6.1). In fact, Karnataka is well on its way to achieving the Tenth Plan objective of reducing MMR to 2 per 1000 births by 2007. Institutional deliveries now account for 51 per cent of total deliveries, compared with 34

per cent for all-India. Small pox has been eradicated; the state is free from plague and guinea worm and the incidence of polio has been considerably reduced. A widespread infrastructure of health and medical institutions comprising primary health centres offering basic services to state-of-the-art super-speciality hospitals with a national, and even international reputation, is now in place.

There are, however, some challenges which the state will have to confront with aggressive strategies. Rural-urban disparities, far from diminishing, have only intensified: for example, the infant mortality rate (IMR) is 64 in rural areas as compared with 24 in urban areas (2004). There are noticeable regional disparities in spite of overall improvements in the various health indicators. The five districts of northeast Karnataka – Gulbarga, Bidar, Koppal, Raichur and Bellary – and two districts of northwest Karnataka – Bagalkot and Bijapur – have worse health indicators than the rest of the state. The health status of the Scheduled Castes and Tribes is cause for serious reflection because it is so distanced from the health status of the total population. Under-nutrition among pregnant women and infants continues to take its toll. The incidence of communicable diseases such as tuberculosis, malaria and intestinal infections is still relatively high. Now the state must confront HIV/AIDS and the very human issues it brings to the fore. Lifestyle-related ailments like diabetes, heart disease, and cancer are also registering an unwelcome increase. Certain preventable health problems continue to

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TABLE 6.1
Some demographic indicators

State/ Country	Decennial population growth (1991-2001)	IMR	NNM	CMR	MMR	LEB
Karnataka	17.5	52	37.1	19.3	195/lakh	65.8
All-India	21	60	43.4	29.3	407/lakh	64.8

Sources:

- Registrar General of India, Census 2001.
- National Family and Health Survey-2, IIPS, Mumbai, 1998-99.
- Registrar General of India, Sample Registration System, SRS bulletin, volume 39 (1), April 2005.



Private sector participation in provisioning healthcare services is still predominantly an urban-based phenomenon. Rural areas must rely on state sponsored healthcare.

survive stubbornly in geographical pockets and specific population groups. Although the maternal mortality rate has declined, it is still unacceptably high for a developed state like Karnataka.

Private sector participation in provisioning healthcare services is still predominantly an urban-based phenomenon. Rural areas must rely on state sponsored healthcare. Here again, it is the poor who are the single largest constituency for public healthcare. It is for these reasons that this chapter will focus on public health services in the state since private sector-managed healthcare does not target the sub-populations who are most at risk and have the least capacity to spend on their health needs.

Population

According to the 2001 census, since 1951 the population of Karnataka has increased two and

a half times to 52.73 million. It progressively increased between 1951 and 1981 but registered a decline in growth, for the first time, in the decade 1981–1991 i.e. from 26.75 per cent to 21.12. It further declined to 17.5 per cent in the decade 1991–2001. Two critical demographic trends which are now becoming visible, are an increase in the size of the working population (15 to 59 years) and a decrease in the below 15 population – both of which have significant policy implications. The first is a possible increase in joblessness if the economy is unable to provide employment for this large labour force; the second is the greying of the population over the next 25 years, which will trigger a need for social security. While Karnataka's population growth during the preceding decade is less than all-India (21 per cent), it is higher than the neighbouring states of Kerala (9.4 per cent), Tamil Nadu (11 per cent) and Andhra Pradesh (13.9 per cent), indicating how imperative it is for Karnataka to sustain this decline in decennial growth.

BOX 6.1

UN Millennium Development Goals to be achieved by 2015

1. Reduce infant and under-5 mortality rates by 2/3rd.
2. Reduce maternal mortality rates by three-quarters.
3. Halt and begin to reverse the spread of HIV/AIDS.
4. Halt and begin to reverse the incidence of malaria and other major diseases.

The crude birth rate (CBR), which was 33.7 in 1971, declined to 22.0 in 2002 – a decline of about 35 per cent. The two neighbouring states of Andhra Pradesh and Tamil Nadu recorded a decrease of 41 and 42 per cent respectively during the same period. The crude death rate (CDR) fell by 45 per cent to 7.2 in 2002 from 13.0 in 1971. The states of Kerala, Andhra Pradesh and Tamil Nadu recorded a decline in CDR of about 30 per cent, 48 per cent and 50 per cent respectively during this period. Across districts, Udipi has the lowest CBR (15.8) and Koppal's CBR of 28.8 is the highest in

BOX 6.2

Karnataka State Integrated Health Policy 2004

Based on the report of the Task Force on Health and Family Welfare (2001), the government formulated a State Integrated Health Policy:

1. Providing integrated and comprehensive primary healthcare.
2. Providing a credible and sustainable referral system.
3. Establishing equity in delivery of quality healthcare.
4. Encouraging greater public–private partnership in the provision of quality healthcare in order to better serve the under-served areas.
5. Addressing emerging issues in public health.
6. Strengthening health infrastructure.
7. Improving access to safe and quality drugs at affordable prices.
8. Increasing access to alternative medicine systems.

the state. At the regional level, the CBR is higher in both the Hyderabad Karnataka and the Bombay Karnataka areas than in south Karnataka. All districts have experienced a substantial decline in the CDR during the last decade. The decline in CDR is higher in Bombay Karnataka and Hyderabad Karnataka than in south Karnataka, probably because the northern districts had such high crude death rates to start with.

This decline in the CBR and CDR has been achieved through changes in several socio-economic and demographic variables over time. Many of these factors relate to women's unequal status in society and any improvement in the following parameters translates into an improvement, not just in the CBR and CDR, but in many other health indicators as well: women's age at marriage, their education levels, their participation in the non-agricultural sector and per capita income. Increasingly, Karnataka, over the last decade, has witnessed many significant changes that have favourably impacted its demographic profile. The proportion of urban population increased from 30.9 per cent to 34.0 per cent, female literacy increased from 44.3 to 57 per cent, the female work participation rate went up from 29.4 per cent to 32.0 and per capita income increased from Rs.6,739 (1990-91) to Rs.11,516 (2001-02). At the same time, the age at marriage for females increased to about 20 years and the proportion of married females in the age group 15-44 declined to about 75 per cent. In addition to these changes, the reduction in mortality as well as fertility can be attributed to an improvement in medical facilities at different levels and stages, as there has been a considerable expansion of health institutions and staff, in both public and private sectors.

Life expectancy

Expectation of life at birth is the most comprehensive index of health, in the sense that good health status translates into higher life expectancy. Karnataka has seen a consistent improvement in life expectancy at birth (LEB) since 1971 (Table 6.3). Male life expectancy in Karnataka was higher than female life expectancy upto 1981, and thereafter the trend has reversed,

TABLE 6.2
CBR and CDR: Regions of Karnataka, India and selected states

State/Region	CBR		CDR	
	1990-91	2000-01	1990-91	2000-01
Karnataka	27.0	22.4	8.6	7.6
South Karnataka	26.2	18.3	7.5	6.8
Hyderabad-Karnataka	28.6	23.0	9.0	8.2
Bombay-Karnataka	29.4	23.5	8.9	8.1
India	29.5	25.6	9.8	8.5
Kerala	18.3	17.0	6.3	6.4
Uttar Pradesh	35.4	31.4	12.3	9.5
Orissa	29.4	24.0	12.2	10.4

Note: For the regions, estimated from the district level estimated rates.

Source: SRS bulletin of respective period.

as indeed it should because, biologically, females have better survival rates than males.

The increase in LEB has brought about a significant change in the profile of the population. The proportion of the population in the age group 60 years and above increased from 7.6 per cent in 1971 to 11.4 per cent in 1999. The percentage of female population in the age group 60 years and above (7.7 per cent), which was less than the male proportion (7.9 per cent) in 1971 has now increased to 12 per cent, as compared to 11 per cent for males in 1999. There has also been a noticeable change in the age structure due to

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TABLE 6.3
Expectation of life at birth of males and females in Karnataka and India
(Years)

Year	Karnataka			India		
	Male	Female	Total	Male	Female	Total
1971-75	50.9	50.1	50.6	50.5	49.0	49.7
1975-81	53.4	52.8	53.1	52.4	52.7	52.5
1981-86	60.2	61.1	60.7	55.4	55.7	55.5
1986-91	62.2	63.3	62.8	58.1	59.1	58.6
1991-96	64.2	65.3	64.7	60.1	61.4	60.7
1996-2001	65.6	66.6	66.1	62.4	63.4	62.9

Sources:

1. Publications of Sample Registration System, RGI.
2. Registrar General of India, Census of India.
3. Family Planning Year Book.

Morbidity rates are important determinants of the health status of a population and provide policy inputs to health planners. Increased morbidity levels have an adverse effect on productivity, resulting in chronic worker absenteeism, loss of person-days and a reduction in income.

the decline in CBR and CDR. This change in the size of the aging population is reflected in the emergence of various healthcare issues associated with the elderly such as diabetes, heart disease, diseases related to the nervous system and mental health. With this greying of the population likely to increase over the next decade, geriatric care must become part of the focus of public healthcare systems.

Morbidity

Morbidity rates are important determinants of the health status of a population and provide policy inputs to health planners. The NSS in its 52nd round on morbidity pattern has estimated that about 4.4 per cent in rural population and 4 per cent in the urban population in the state were ill during the period 15 days prior to the survey, i.e. about 22 lakh persons are ill at any given point of time, which is an indication of the magnitude of the problem (Table 6.4). Increased morbidity levels have an adverse effect on productivity, resulting in chronic worker absenteeism, loss of person-days and a reduction in income. The hardest hit are the poor, who find their productivity levels falling at the very moment that there are demands on their purse to pay for treatment. Chronic bouts of illness or even one episode can send a family over the poverty line into indebtedness. NSS data throws light on the reasons people give for not seeking treatment for ill-health. The survey shows that the major reason is that the ailment is not considered serious enough to require attention. There have been some significant changes between the two surveys, i.e. 1986-87 and 1995-96. Financial reasons gain in importance as a reason for not taking treatment in rural areas

and both rural and urban areas report an increase in awareness about health.

The NFHS, during its two rounds of surveys, provided some valuable information on the prevalence of some diseases. Between the two survey points NFHS-1 and NFHS-2, the incidence of malaria in the rural areas of Karnataka increased from 5 to 7.7 per 1,000 persons, while at the national level, the incidence in rural areas recorded an increase from 39 to 42.5 during the same period. The incidence of malaria for the state as a whole increased to about 21 during 2001 and declined to about 10 during 2003. Areas with a high incidence of malaria are Mangalore and Bellary along with the project areas of the Upper Krishna Project (Almatti and Narayanpura), which are highly susceptible.¹ The prevalence of tuberculosis in Karnataka is about 3 per 1,000 persons in rural areas and 2.2 per 1,000 persons in urban areas (NFHS-2). However, the overall increase was about 2.98 per cent during 1999-2003.²

The incidence of leprosy in Karnataka is low at one per 1,000 persons and the latest data from the National Leprosy Eradication Programme reveals that the prevalence rate of leprosy in 2003 has further declined to 0.2 per 1,000 persons. Leprosy is more prevalent in Gulbarga, Raichur, Bellary, Koppal and Gadag, all north Karnataka districts.

HIV/AIDS

Acquired Immune Deficiency Syndrome (AIDS) is caused by the HIV virus, which weakens the body's immune system and leads to death through secondary infections. The first case of full-blown AIDS in Karnataka was detected in 1988. Since then, the prevalence of HIV and AIDS has been rising and is a cause for concern with 24,236 HIV cases and 1,730 cases of AIDS being reported from 1988 to 2003. During the same period, 189 AIDS-related deaths were recorded.

TABLE 6.4

Persons reporting any ailment in the last 15 days prior to survey, by sex and residence

(Per cent)

Region		Male	Female	Persons
Rural	India	5.4	5.7	5.5
	Karnataka	4.1	4.8	4.4
Urban	India	5.1	5.8	5.4
	Karnataka	3.9	4.2	4.0

Source: Morbidity and treatment of ailment, NSS - 52nd round, No.441, 1998.

¹ Government of Karnataka (2004): Data under National Anti Malaria Programme, Directorate of Health and Family Welfare Services, Bangalore.

² Government of Karnataka (2004): Data on prevalence rate of T.B., Leprosy, Directorate of Health and Family Welfare Services, Bangalore.

TABLE 6.5
HIV cases in Karnataka

Year	HIV cases	Percentage increase
Upto 1998	4309	
1999	1319	
2000	1965	48.9
2001	2900	47.8
2002	4488	54.8
2003	9255	106.2

Sources:

1. Karnataka AIDS Prevention Society.
2. Directorate of Health and Family Welfare Services, Karnataka.

The increase of HIV cases has been alarming, particularly during the last two years. The rate of increase during 2001-02 was 55 per cent and during 2002-03, it increased to 106.2 per cent. Currently an estimated five lakh people are infected with HIV. Karnataka has put a good reporting and monitoring system in place, unlike most of the reportedly 'symptom-free' states. The objectives of the government's policy are to keep HIV prevalence below three per cent, to reduce blood-borne transmission to less than one per cent, to achieve condom usage in not less than 90 per cent of high-risk groups and to ensure that awareness is created about HIV/AIDS. In 2004, the state established 40 voluntary counselling and testing centres (VCTCs) at the taluk level for the prevention and care.

Infant and child mortality

The present level of infant mortality in Karnataka is 52 per thousand live births (SRS 2003) – a

TABLE 6.6
IMR for Karnataka and India

Year	Karnataka			India		
	Total	Rural	Urban	Total	Rural	Urban
1981	69	77	45	110	119	62
1984	74	84	43	104	113	66
1987	75	86	41	95	104	61
1990	70	80	39	80	86	50
1993	67	79	42	74	82	45
1996	63	71	40	71	80	45
1999	58	69	24	70	75	44
2002	55	65	25	64	69	40
2003	52	61	24	60	66	38

Source: SRS bulletin of various years.

significant decline of about 45 per cent, from 95 in 1971. At the national level, the decline in IMR is about 62 per cent though the estimated level of IMR at both points of time is higher than that of Karnataka (Table 6.6).

The various rates of IMR and child mortality rate (CMR) by residence (NFHS-1 and NFHS-2) are presented in Table 6.7. There has been a decline of about two infant deaths per 1000 live births each year. However, the SRS data on IMR for Karnataka prior to both surveys showed a faster decline during 1971–81. Rural mortality rates are significantly higher than the urban rates. If two segments of IMR, viz. neonatal and post-neonatal are separated, it is clear that the proportion of neonatal deaths to the total IMR has shown a three percentage points increase between two surveys as against a decline of three percentage points in post-neonatal deaths.

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TABLE 6.7
Infant and child mortality in NFHS-1 and NFHS-2: Karnataka

Year	Neonatal mortality			Post-neonatal mortality			Infant mortality			Child mortality			Under-five mortality		
	R	U	T	R	U	T	R	U	T	R	U	T	R	U	T
NFHS-1 (1988-92)	47.7	39.4	45.3	20.0	20.6	20.2	67.7	60.0	65.4	28.6	11.3	23.5	94.4	70.6	87.3
NFHS-2 (1994-98)	39.3	32.1	37.1	17.2	8.1	14.4	56.5	40.1	51.5	23.9	9.0	19.3	79.0	48.8	69.8
Decline during the period (per cent)	17.6	18.5	18.1	14.0	60.6	28.7	16.5	33.2	21.3	16.4	20.4	17.8	16.3	30.9	20.1

Note: R: Rural; U: Urban; and T: Total.

Source: National Family Health Survey 1 and 2, Karnataka, IIPS, Mumbai.

TABLE 6.8
**IMR in the regions of Karnataka,
 all-India and selected states**

Regions	IMR	
	1990-91	2001-02
Karnataka	82	55
South Karnataka	72	50
Hyderabad Karnataka	86	60
Bombay Karnataka	85	59
All-India	86	64
Kerala	17	10
Orissa	123	87

Note: Rates are estimated.

Source: SRS bulletin, various years.

There is a correlation between high IMR and the low socio-economic standing of families, gender disparity, illiteracy and lack of institutional support.

A sizeable decline of about 61 per cent has occurred in the urban post-neonatal death rate.

During 2001-02 Dakshina Kannada district (44) had the lowest IMR followed by Udupi, Bangalore Urban and Shimoga (45). The district with the highest IMR is Dharwad (69) followed by Bijapur, and Gulbarga (67), Bidar and Gadag (66). All districts with an IMR higher than the national average are in north Karnataka. Overall, the southern districts in Karnataka present the best scenario with an IMR of 50 compared with Bombay Karnataka (59) and Hyderabad Karnataka (60). Karnataka will have to step up its efforts to catch up with states like Kerala (10) and Tamil Nadu (44). Currently, only the best performing district is on a par with the Tamil Nadu aggregate.

There has also been a drop of about 20 per cent in child mortality and in under-five mortality. Data on differentials in infant and child mortality is not easily available, either at state or district level. Different surveys (which have limitations) provide some information on districts. Data provided by NFHS-2 on differentials is useful for understanding the influences of factors related to infant and child mortality.

There is a correlation between high IMR and the low socio-economic standing of families, gender disparity, illiteracy and lack of institutional support. Contributory factors to infant mortality range from low per capita income, under-

representation of women in the non-agriculture sector, early marriage for women, female illiteracy, under-nutrition of both the mother and foetus, high CBR and CDR, poor access to antenatal care (ANC), low birth weight, unsafe deliveries and the inadequate reach of the services provided by the healthcare system. Kolar, Bijapur, Bagalkot, Dharwad, Haveri, Gadag, Bidar, Gulbarga, Koppal, Chikmagalur, Hassan, Raichur, Uttara Kannada, Mysore, Mandya and Kodagu have an IMR higher than the state average. While most districts have some or most of the pre-disposing factors for high IMR mentioned above, it is indeed surprising to find the relatively better developed districts such as Hassan and Kodagu performing poorly.

Infant death can occur at 2 stages: neonatal and post-neonatal. Neonatal deaths take place during the first 4 weeks of life and post-neonatal deaths occur between 1 to 12 months of age. The incidence of both neonatal and post-neonatal mortality can be reduced significantly if the appropriate measures are taken in time. Timeliness is crucial. About 0.40 lakh neonatal deaths take place annually in the state. About 80 per cent of total infant deaths in urban areas and 69 per cent of total infant deaths in rural areas are neonatal deaths. This is also a period when mothers are vulnerable, as evidenced by the fact that most maternal deaths occur in the four week period after child birth. The majority of neonatal deaths are caused by the mother's own health status (which is normally poor because of under-nutrition) resulting in low birth weight, premature birth, asphyxia, infectious diseases, pneumonia, tetanus, diarrhoea combined with lack of access to institutional services.

Mortality rates are higher among infants born to mothers who are below 20 years and above 30 years of age. A clear association is evident between IMR and birth intervals. The IMR is quite high (98.8) when the duration of the birth interval is less than 24 months and decreases with an increase in the interval between births, for example, IMR is 32.3 when the birth interval is 48 months and above. Since neonatal mortality is lower when the birth interval is more than 24 months and the age of the mother is in the age group 20-29, one way of

reducing neonatal mortality is to encourage young couples to space births. Currently, only a low five per cent use spacing methods. Bangalore Urban, Dakshina Kannada, Kodagu and Uttara Kannada are the few districts where more than 10 per cent of couples use spacing methods.

Infant and child mortality declines considerably with increases in standards of living (Table 6.9). The poor are caught in a cycle of low income and ill-health, which are mutually self-reinforcing. The poor cannot afford the costs of a nutritious diet or antenatal and post-natal care, the absence of which can result in high-risk pregnancies which

mean either indebtedness or maternal death. High rates of female illiteracy have very adverse effects on the survival of mothers and their children in terms of women's lack of awareness of nutrition or postpartum care.

The causes of death in infancy are the same for boys and girls. Slow foetal growth because of malnutrition is the major cause of death and accounts for 33 to 34 per cent of infant deaths. Birth asphyxia and other respiratory conditions account for 26 per cent of infant deaths among boys and girls. In the age group 1-4 years, injury and other accidents are a major cause of mortality

Slow foetal growth because of malnutrition is the major cause of death and accounts for 33 to 34 per cent of infant deaths.

TABLE 6.9
Infant and child mortality for a ten-year period preceding NFHS-2: Karnataka 1999

Characteristics		Neonatal	Post- neonatal	Infant mortality	Child mortality	Under-five mortality
Residence	Urban	35.6	8.5	44.1	12.1	55.7
	Rural	48.3	22.0	70.3	27.1	95.5
Sex of child	Male	53.6	16.5	70.1	21.1	89.7
	Female	34.6	19.3	54.1	23.8	76.6
Religion/ Caste/ Tribe	Hindu	47.5	18.1	65.5	24.0	86.0
	Muslim	33.0	16.4	49.5	17.0	65.0
	SC	46.9	23.0	69.9	37.4	104.6
	ST	63.2	21.9	85.0	38.9	120.6
	Others	39.6	16.8	56.4	14.2	69.8
Standard of living	Low	60.9	21.2	82.2	38.5	117.5
	Medium	36.9	17.7	54.6	13.6	67.5
	High	28.7	9.5	38.2	12.4	50.1
Mother's education	Illiterate	52.9	23.3	76.2	29.2	130.1
	Middle school	40.8	10.9	51.7	4.3	55.8
	High school and above	29.3	8.5	37.8	5.65	43.1
Mother's age at birth	< 20	55.2	19.3	74.4	22.9	96.7
	20 - 29	36.6	16.7	53.3	20.7	72.9
	30 - 39	52.8	20.4	73.2	31.6	102.3
Birth order	1	47.9	13.7	61.5	13.4	74.1
	2	34.7	16.7	51.4	14.3	65.0
	3	40.7	21.2	61.9	30.9	90.9
	4+	54.4	22.5	76.9	36.8	110.9
Birth interval	<24 months	68.3	30.5	98.8	40.0	134.8
	24-47 months	29.0	16.1	45.1	21.3	65.4
	48+ months	25.2	7.1	32.3	10.1	42.1

Source: NFHS - 2 - Karnataka, IIPS, Mumbai

TABLE 6.10

Percentage of children who received vaccination, Vitamin A, iron and folic acid tablets/liquid

Districts	Complete BCG+ 3 DPT+ 3 Polio+ Measles	None	Percentage of children who received at least one dose of Vitamin A	Percentage of children who received IFA tablets/liquid
Bangalore Urban	77.7 (90.3)	0.0	38.5	4.3
Bangalore Rural	83.7 (87.7)	0.6	42.1	6.0
Belgaum	64.8 (57.8)	3.3	46.9	7.6
Bellary	52.6	9.3	31.8	5.7
Bidar	50.3 (65.8)	7.9	19.8	3.7
Bijapur	53.2	6.1	27.9	11.3
Chikmagalur	83.5 (85.1)	0.0	40.4	9.0
Chitradurga	88.4	1.3	54.2	5.0
Dakshina Kannada	86.0	0.5	43.1	7.4
Dharwad	74.8	3.9	59.2	6.0
Gulbarga	25.3 (48.1)	31.1	16.6	1.3
Hassan	92.8 (85.6)	0.6	65.5	1.9
Kodagu	94.8 (88.6)	0.5	54.9	7.1
Kolar	90.6 (86.8)	0.0	61.4	1.3
Mandya	88.0 (89.5)	0.5	73.0	8.0
Mysore	92.7	0.4	55.1	3.3
Raichur	37.2 (57.6)	22.0	20.6	7.6
Shimoga	92.9	0.5	81.8	5.0
Tumkur	88.0 (87.7)	0.5	73.0	8.0
Uttar Kannada	89.9 (92.2)	1.5	66.0	10.5
Karnataka	71.8 (78.2)	5.7	48.8	5.6

Note: Figures in brackets refer to RCH data for 2002.

Source: Reproductive and Child Health (RCH) Rapid Survey, 1998-99.

Maternal mortality is a crucial indicator of both women's health and of gender justice, raising as it does, questions about women's lack of control over their own bodies.

among both boys and girls. These answer for 19 per cent of deaths among boys and 21 per cent among girls. The second most common cause of death is diseases of the respiratory system, which are predominant among boys (13 per cent), and intestinal infectious diseases among girls (12 per cent). Tuberculosis causes more than 7 per cent of deaths among children.

Immunisation of children

Immunisation of children against six serious but preventable diseases viz. tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis and measles is an important instrument of child survival. The

state's programme also includes administration of five doses of Vitamin A for the prevention of night blindness and iron folic acid solution for iron supplementation. The reproductive and child health (RCH) survey of Karnataka (1998-99) shows that the coverage is satisfactory except in some of the northern districts. The immunisation coverage for the children has improved in 14 districts other than Belgaum, Hassan, Kodagu and Kolar (RCH 2004). The desired objective of complete coverage seems quite attainable in some districts, but the performance in some others, like Raichur, is disappointing indeed.

Maternal mortality

Women's health encompasses many areas of concern but since most female deaths are caused by child birth, maternal mortality is a crucial indicator of both women's health and of gender justice, raising as it does, questions about women's lack of control over their own bodies.

The maternal mortality rate (MMR) in Karnataka is 195, which is substantially lower than all-India (407) (Table 6.11). Among the southern states, Karnataka is better than Kerala (198) but has a higher MMR than Tamil Nadu (79) and Andhra Pradesh (159). The leading causes of maternal deaths in Karnataka are sepsis (33 per cent) haemorrhage (27 per cent), anaemia (13.3 per cent) and abortion (7 per cent). Deaths caused by haemorrhage and obstructed labour can be prevented if good obstetric care is available at all times, but since such facilities are available only in big urban hospitals, many rural women cannot access emergency services in time. Eclampsia is another leading cause of maternal mortality, which can be prevented through regular antenatal care. Abortions should be performed only in hospitals where proper facilities are available, but ignorance or fear of detection propels many women into the doors of unqualified abortionists. As in the case of infant mortality, and indeed the two are intimately inter-related, the causes of maternal mortality are a mix of factors such as women's lack of control over their reproduction, poverty, under-nutrition, illiteracy and lack of accessibility to both ante- and post-natal care.

TABLE 6.11
Causes of maternal mortality in selected states: 1998

	Karnataka	AP	TN	Kerala	All-India
Maternal mortality rate	195	159	79	198	407
Causes (percentage)					
Abortions	6.7	-	16.7	-	8.9
Toxaemia	20.0	-	-	9.1	8.3
Haemorrhage	26.7	22.2	16.7	27.3	29.6
Obstructed labour	-	33.3	50.0	-	9.5
Puerperal sepsis	33.3	44.4	16.7	9.1	16.1
Anaemia	13.3	-	-	18.2	19.0
Others	-	-	-	36.4	2.1

Source: SRS Bulletin, Vol. 33, No.1, 2000.

Maternal and child health services

Maternal and child health (MCH) services are the two major components of the reproductive and child health (RCH) programme that is provided through primary health centres (PHCs) and sub centres in the rural areas of Karnataka. In urban areas, maternal and child health services are available in government hospitals, urban health centres, hospitals and clinics operated by NGOs and various private nursing homes and maternity homes. MCH has several components, of which, antenatal care and institutional deliveries are critical to ensuring safe delivery and maternal survival.

As we saw earlier, reducing neonatal deaths, which constitute nearly 70 per cent of infant deaths, would bring down the IMR significantly and position the state within reach of achieving the MDGs in both infant and maternal mortality. The government strategy combines community healthcare with institutional healthcare. Primary healthcare is mainly provided by health workers (ANMs) and traditional birth attendants (*dais*) who are required to visit the homes of pregnant women to ensure adequate antenatal care and to ensure early identification of problem pregnancies.

Antenatal care

The proportion of pregnant women receiving antenatal care (ANC) increased by about 3 percentage points between two surveys. In urban

areas, this proportion has increased much more significantly than in rural areas. The proportion of pregnant women among Scheduled Tribes receiving professional care has declined though there has been an increase among Scheduled Caste women. Antenatal examinations by doctors have also increased (Table 6.12).

The main components of the government's antenatal care programme are supply of iron and folic acid tablets, tetanus (TT) immunisation, and three ANC visits. The RCH rapid household survey during 1997-98 provides information about district level ANC services (Table 6.13). Coverage of pregnant women by a complete ANC package comprising a minimum three ANC visits, at least one TT injection and supply of IFA tablets, varied from a high 88 per cent in Kodagu to 26 per cent in Bellary with the state averaging 60 per cent. In northern Karnataka, while the coverage by any type of ANC is high, coverage by the complete ANC package is alarmingly low. Women who do not complete the full course do not get the protection required to withstand anaemia and tetanus and potential problems are not identified in time for treatment. The situation is more serious when data on full ANC services of 2002 is analysed. It shows that while coverage by any type of ANC service has improved, the percentage of women receiving full ANC has declined. One inference is that healthcare staff was not able to ensure that women who initially utilised ANC services were

Maternal and child health services are the two major components of the reproductive and child health programme that are provided through primary health centres and sub-centres in the rural areas of Karnataka.



TABLE 6.12

Percentage of pregnant women who received antenatal services by background characteristics

Background characteristics		NFHS-1				NFHS-2			
		At home	Outside home		Total	At home	Outside home		Total
			From doctor	From other health professionals			From doctor	From other health professionals	
Mother's age	<20	17.3	58.6	4.5	80.4	3.4	65.6	13.5	82.5
	20 - 24	18.7	60.7	5.9	85.3	5.5	72.9	10.0	88.4
Residence	Urban	5.0	77.8	3.9	86.7	1.2	86.7	6.5	94.4
	Rural	24.1	52.0	5.9	82.0	6.4	62.9	13.3	82.6
Caste	SC	24.7	51.7	5.1	80.5	7.1	63.3	12.0	82.4
	ST	20.5	53.6	4.5	78.6	9.9	48.5	13.4	71.8
Standard of living	Low	NA	NA	NA	NA	6.8	54.0	13.5	74.3
	Medium	NA	NA	NA	NA	4.6	74.2	11.4	90.2
	High	NA	NA	NA	NA	1.4	90.9	5.9	98.2
Total		18.6	59.4	5.4	83.4	4.8	70.3	11.2	86.2

Note: NA - Not available.

Sources:

1. National Family Health Survey-1, Karnataka 1992-93.
2. National Family Health Survey-2, Karnataka 1998-99.

TABLE 6.13

Percentage of women who received ANC services: 1998-99 and 2002

Districts	Any type of ANC		Full ANC (3 ANC visits at least one TT+IFA given)	
	1998-99	2002	1998-99	2002
Bangalore Urban	98.7	98.2	78.4	45.6
Bangalore Rural	93.9	94.3	69.1	49.8
Belgaum	91.7	96.3	45.6	25.1
Bellary	65.0	NA	26.5	NA
Bidar	79.6	87.3	37.9	18.5
Bijapur	73.3	NA	34.4	NA
Chikmagalur	97.8	98.3	68.2	39.9
Chitradurga	91.0	NA	67.8	NA
Dakshina Kannada	98.5	NA	84.9	NA
Dharwad	91.8	NA	60.4	NA
Davangere	70.1	80.0	28.1	12.8
Hassan	97.2	98.3	70.2	26.3
Kodagu	100.0	98.0	88.4	34.6
Kolar	95.2	97.0	75.3	34.6
Koppal	NA	81.1	NA	24.4
Mandya	91.7	97.0	67.2	28.7
Mysore	96.4	NA	75.8	NA
Raichur	78.7	69.7	32.6	25.5
Shimoga	97.6	NA	82.2	NA
Tumkur	95.4	94.2	76.5	41.1
Uttara Kannada	98.4	98.8	76.4	34.6
Average (all districts)	88.9	92.0	60.1	31.5

Note: NA - Not available.

Source: RCH Rapid Survey, 1998-99 and 2004.

motivated to complete the course. Possibly staff failed to ensure full coverage for various reasons ranging from lack of personnel to inadequate supplies of drugs and diagnostic kits.

Institutional delivery

The second important focus of the reproductive and child health (RCH) programme is safe delivery i.e. delivery, should take place in hygienic conditions and under the supervision of trained health professionals. Safe deliveries are less likely to be accessible to the rural poor and the Scheduled Castes and Tribes for several reasons (Table 6.14).

There has been a considerable improvement in the proportion of safe deliveries at the district level though the number is low in northern Karnataka. Women resort to home deliveries for economic reasons primarily, although distance from the health facility, customary practices and lack of knowledge about the facilities available are other reasons. The government has converted 400 primary health centres into 24-hour service providers in 2005-06 to increase institutional deliveries. This is a step in the right direction.

Family planning

The current contraceptive prevalence rate of 60 per cent is slightly higher than the all-India average,

which is 58.8 per cent. Female sterilisation (52.5 per cent) IUD (3.5 per cent) CC users (1.0 per cent) and traditional methods (1.3 per cent) are the principal methods. Male sterilisation is a low 0.7 per cent. The prevalence rate is highest in Himachal Pradesh followed by West Bengal. Women continue to bear a disproportionate share of the responsibility for birth control although the decision-making rarely rests with them. Among districts, the prevalence rate varies from 39 per cent in Gulbarga to 75 per cent in Hassan. Similarly, for spacing methods, Gulbarga records a low prevalence rate of 0.9 per cent and Dakshina Kannada records 11.4 per cent, which is not satisfactory.

Nutrition

Nutrition is a significant determinant of good health and the incidence of mal- and under-nutrition in the community affects certain indicators such as IMR and MMR adversely. For the poor, an improvement in per capita income combined with the availability of cheaper food is a step towards ensuring higher levels of food consumption. The status of nutrition is, however, also dependent on food consumption patterns, which, in turn, are shaped to a great degree by women's status relative to men. Custom dictates that women eat least and last in the feeding order, followed closely by children. Not surprisingly, the greatest levels of poor nutrition occur among women and children. An insufficient food intake and ignorance about nutrition coupled with low immunity ensure that the most vulnerable experience very fragile health. In this context, the greatest changes can occur only when there is an improvement in women's status and an enhancement of per capita food availability.

Child nutrition

The NFHS-2 has examined the nutritional status of children up to 3 years of age by weight-for-age, height-for-age and weight-for-height. Children who are more than -2SD below the reference median on any of the indices are considered to be undernourished and children who are more than -3SD below the reference median are considered to be severely undernourished. Table 6.15 presents the percentage of children

TABLE 6.14

Distribution of deliveries by place of delivery

Background characteristics		Health facility/institution				Home
		Public	NGO/Trust	Private	Total	
Residence	Urban	38.6	1.8	38.4	78.8	21.2
	Rural	22.9	1.1	14.5	38.5	61.5
Caste	SCs	26.2	2.0	11.0	40.2	59.8
	STs	24.8	-	6.2	31.0	69.0
Standard of living	Low	25.6	0.7	5.1	31.4	68.6
	Medium	32.6	2.0	20.4	55.0	45.0
	High	19.1	0.9	58.7	78.7	21.3
Total		27.8	1.3	22.0	51.1	48.9

Source: National Family Health Survey - 2, Karnataka, 1998-99.

classified as undernourished by selected characteristics. About 44 per cent of children below three years of age are underweight and about 37 per cent are stunted. The proportion of children who are severely undernourished is about 17 per cent according to the weight-for-age and about 16 per cent according to height-for-age. These figures are lower than India. The level of wasting (weight-for-height) is about 20 per cent, which is higher than all-India (16 per cent). Girls are more underweight and stunted than boys while boys are more wasted. Under-nourishment is considerably higher among rural children and among SC and ST children. The importance of female education is flagged by the fact that the children of illiterate mothers are more undernourished than the children of literate mothers and that the proportion of undernourished children declines sharply with an increase in the living standards of parents.

In 1998-99, the weight-for-age index (a composite measure of chronic and acute under-nutrition) showed that 43.9 per cent of children below 3 years of age were underweight. This proportion is the highest among the southern states though lower than all-India. With regard to the height-for-age index 36.6 per cent of children below 3 years are undernourished. Andhra Pradesh has the highest proportion of undernourished children with 38.6 per cent while Kerala and Tamil Nadu have lower proportions. According to the weight-for-height

The greatest changes can occur only when there is an improvement in women's status and an enhancement of per capita food availability.

TABLE 6.15
Nutritional status of children under 3 years

(Percentage)

Characteristics		Weight-for-age		Height-for-age		Weight-for-height	
		-3SD	-2SD	-3SD	-2SD	-3SD	-2SD
Sex of the child	Male	14.9	42.2	14.6	35.1	4.2	21.4
	Female	18.2	45.7	17.2	38.1	3.5	18.5
	Total	16.5	43.9	15.9	36.6	3.9	20.0
Residence	Rural	19.7	46.4	17.6	39.3	4.7	21.8
	Urban	9.9	38.7	12.2	30.9	2.1	16.2
Mother's education	Illiterate	24.6	56.5	22.1	46.0	6.5	24.8
	Literate (< middle school)	12.7	43.8	16.0	36.0	1.7	19.9
	Middle school completed	8.5	34.6	10.5	28.5	1.1	13.6
	High school and above	5.7	21.6	5.1	20.6	1.2	12.5
Caste	SCs	23.0	52.8	17.9	43.7	6.8	27.9
	STs	28.7	55.7	22.1	41.2	1.6	21.0
Standard of living	Low	21.9	54.6	21.9	44.1	5.6	25.0
	Medium	17.4	45.3	15.3	38.2	3.8	20.2
	High	4.0	20.0	6.1	18.3	1.2	10.1

Note: -2SD includes children who are below -3SD.

Source: NFHS-2, Karnataka, 1998-99.

TABLE 6.16
Percentage of undernourished children below 3 years

State	Weight-for-age		Height-for-age		Weight-for-height	
	-3SD	-2SD	-3SD	-2SD	-3SD	-2SD
Andhra Pradesh	10.3	37.7	14.2	38.6	1.6	9.1
Karnataka	16.5	43.9	15.9	36.6	3.9	20.0
Kerala	4.5	26.9	7.3	21.6	0.7	11.1
Madhya Pradesh	24.3	55.1	28.3	51.0	4.3	19.8
Tamil Nadu	10.6	36.7	12.0	29.4	3.8	19.9
India	18.0	47.0	23.0	45.5	2.8	15.5

Note: -2SD includes children who are below -3SD.

Source: NFHS-2 India, 1998-99.

TABLE 6.17
Anthropometric indicators of nutritional status of children

Weight-for-age		Height-for-age		Weight-for-height	
-3SD	-2SD	-3SD	-2SD	-3SD	-2SD
12.7	31.0	31.0	22.5	1.4	4.2

Source: National Nutrition Monitoring Bureau, NIN: Assessment of Diet and Nutritional Status of Rural Community, 2004.

index 20 per cent of children, below 3 years are undernourished, the highest among southern states and above all-India as well (Table 6.16). The National Nutrition Monitoring Bureau, in its Rural Survey 2004 has more current information on the nutritional status of rural children and women of Karnataka. Table 6.17 presents the proportion of children in the age group 1–5 years according to three anthropometric measures.

It is thus clear that the nutritional profile of rural children has improved over the last five years. However, the height-for-age factor remains a matter of concern. The average intake of food (gm/day) for children (rural) also shows a somewhat even distribution and a varied diet (Table 6.18). Children are not consuming enough protein as the proportion of children with 'protein-calorie adequacy' is 23.3 per cent of the children in the age group 1-3 years and 31.6 per cent of the children in the age group 4-6 years. However, the scenario in Karnataka is better than Tamil Nadu and Kerala for corresponding age groups (NNMB, Rural Survey, 2004).

Anaemia in children

Anaemia has serious implications for children's mental and physical growth as well as making them vulnerable to infectious diseases. The high-risk group is children aged 6–24 months. The level of anaemia for children age 6 to 35 months as measured in NFHS-2 (Karnataka) shows that about 71 per cent of children have some level of anaemia: 20 per cent are mildly anaemic, 43 per cent are moderately anaemic and 8 per cent are severely anaemic. Mainly, boys, children in rural areas and SC and ST children have high levels of anaemia (Table 6.19). The level of anaemia among children in Karnataka is lower than in Andhra Pradesh and all-India (Table 6.20).

TABLE 6.18

Average intake of foodstuffs (gm/day) of children: Karnataka 2004

Foodstuffs	Children 1–3 years	Children 4–6 years
Cereals and millets	136	229
Pulses	9	22
Leafy vegetables	5	12
Other vegetables	9	23
Roots and tubers	14	13
Milk and milk products	37	84
Fish/Meat	2	2
Fruit	14	21
Fat and oil	3	5
Sugar and jaggery	10	11

Source: National Nutrition Monitoring Bureau, NIN: Assessment of Diet and Nutritional Status of Rural Community, 2004.

TABLE 6.19

Percentage of children aged 6–35 months classified as having anaemia by background characteristics: Karnataka

Background characteristics		Percentage of children with any anaemia	Percentage of children		
			Mild anaemia	Moderate anaemia	Severe anaemia
By sex of the child	Male	72.7	17.5	45.6	9.4
	Female	68.4	21.9	40.8	5.8
	Total	70.6	19.6	43.3	7.6
Residence	Urban	66.3	19.5	41.7	5.1
	Rural	72.7	19.7	44.1	8.9
Caste	SCs	77.7	21.9	46.4	9.4
	STs	71.9	18.1	43.8	10.1
Standard of living	Low	78.8	18.1	51.0	9.7
	Medium	68.7	19.3	41.8	7.5
	High	62.0	23.9	34.6	3.5

Source: NFHS-2, Karnataka, 1998-99.

TABLE 6.20

Percentage of children aged 6–35 months classified as having anaemia: Karnataka and selected states

States	Percentage of children with any anaemia	Percentage of children		
		Mild anaemia	Moderate anaemia	Severe anaemia
Andhra Pradesh	72.3	23.0	44.9	4.4
Haryana	83.9	18.0	56.9	7.1
Karnataka	70.6	19.6	43.3	7.6
Kerala	43.9	24.4	18.9	0.5
Rajasthan	82.3	20.1	52.7	9.5
Tamil Nadu	69.0	21.9	40.9	6.9
India	74.3	22.9	45.9	5.4

Source: NFHS-2, India, 1998-99.

About 42 per cent of women in the reproductive age are anaemic. All age groups are uniformly affected, with a slightly higher prevalence in younger ages, which is a matter of concern, as they constitute the largest proportion of the fertile population among women in the state.

Women's nutrition

The consumption of a varied and nutritious diet is crucial for the health of all people but particularly for women in the reproductive age. For a balanced diet adequate quantities of protein, fat, carbohydrates, minerals and vitamins are required and these are found in meat, fish, egg, milk, pulses, cereals, vegetables and fruit. NFHS-2 data on the consumption pattern among married women (Table 6.21) shows that a majority consume pulses and milk/curd at least once a week. More than 90 per cent eat vegetables once a week and about 54 per cent eat fruit at least once a week. Women in urban areas consume a greater variety of food items than rural women. The consumption of all food items is relatively low among SC and ST women. Women with a high standard of living inevitably have the highest consumption of all food items.

The nutritional status of the ever married women is expressed through body mass index (BMI). The BMI is the product of weight in kilograms divided by squared height in metres and expressed as (kg/m²). The cut-off point for height, below which a woman can be identified as nutritionally at risk, is in the range of 140-150 cm. The average height of women in Karnataka is 152 centimetres (one cm taller than the all-India average). The mean height for women

in Karnataka varies slightly among different groups and only about 10 per cent are under 145 centimetres in height.

The mean BMI for women in Karnataka is 20 and varies within a small margin of 19-23 in different groups. About 39 per cent of women have a BMI below 18.5 indicating a high prevalence of nutritional deficiency. Nutritional deficiency is higher among women who are from rural areas, illiterate, low income and among SCs and STs. (Table 6.22).

The percentage of women with BMI below the norm is 38.8 in Karnataka as compared to 35.8 per cent for all-India. A comparison with the southern states shows that Karnataka has the highest proportion of women with BMI below the norm (Table 6.23).

Anaemia among women

Given the inadequacy of their diet, iron deficiency anaemia is widely prevalent among the ever married women in the age group 15-49. About 42 per cent of women in the reproductive age are anaemic. All age groups are uniformly affected, with a slightly higher prevalence in younger ages, which is a matter of concern, as they constitute the largest proportion of the fertile population among women in the state. In order of severity,

TABLE 6.21
Women's food consumption by background characteristics (at least once a week)

Background characteristics		Type of food						
		Milk or curd	Pulses or beans	Green leafy vegetables	Other vegetables	Fruits	Eggs	Meat or chicken or fish
Residence	Urban	85.7	99.2	96.1	96.1	72.2	50.8	44.6
Education	Rural	70.1	98.3	91.7	89.5	43.8	34.0	28.2
	Illiterate	65.2	98.2	91.6	88.8	38.2	36.6	31.1
Caste	Literate	88.0	99.0	95.2	95.6	71.6	44.3	38.0
	SCs	55.7	97.9	92.2	91.0	39.8	49.4	44.5
	STs	62.7	98.1	90.2	86.6	38.1	37.2	26.6
Standard of living	Low	57.6	98.0	90.2	86.9	33.3	35.3	29.9
	Medium	78.4	98.7	90.2	92.1	54.0	40.6	33.8
	High	94.6	99.4	98.1	92.1	82.6	44.4	39.8
Total		75.5	98.6	93.3	91.8	53.7	39.9	33.9

Source: NFHS-2, Karnataka 1998-99.

TABLE 6.22
Nutritional status among ever married women in Karnataka: 1999

Background characteristics		Mean height (cm)	Percentage below 145 cm	Weight mean body index (MBI)	Percentage below BMI (18.5kg/m ²)
Residence	Urban	151.8	11.4	22.3	23.8
	Rural	152.1	8.6	19.3	47.0
Caste	SCs	151.5	11.3	19.1	44.2
	STs	151.9	9.4	19.2	49.0
Standard of living	Low	151.4	11.0	18.9	50.5
	Medium	151.8	9.6	20.1	41.4
	High	153.3	7.5	23.1	16.5
Total		152.0	9.6	20.4	38.8

Source: NFHS-2, Karnataka, 1998-99.

TABLE 6.23
Body Mass Index: Karnataka, southern and other selected states

State	Mean height (cm)	Percentage below 145 cm	Mean body index (MBI)	Percentage with BMI below 18.5kg/m ²
Andhra Pradesh	151.2	12.7	20.3	37.4
Karnataka	152.0	9.6	20.4	38.8
Kerala	152.6	8.8	22.0	18.7
Tamil Nadu	151.5	12.0	21.0	29.0
India	151.2	13.2	20.3	35.8
Punjab	154.5	4.1	23.0	16.9
Orissa	150.5	14.9	19.2	48.0

Source: NHFS-2, India, 1998-99.

about 27 per cent are mildly anaemic, about 13 per cent are moderately anaemic and a little over two per cent are severely anaemic. Women living in urban areas have significantly lower levels of all grades of anaemia compared to women in rural areas. This may be an important pointer to the levels of poor hygienic and environmental sanitation in rural areas leading to a high prevalence of intestinal worm infection. Women from the SC and ST communities have a higher prevalence of anaemia.

The proportion of anaemia among women in Karnataka (42.4) is lower than all-India. Andhra Pradesh and Tamil Nadu have a higher prevalence of anaemia than Karnataka (Table 6.25).

Birth weight

The weight of an infant at birth is an important measure of the nutritional status of the mother and an indicator of the child's survival rate. An infant with birth weight less than 2,500 grams is at high risk. It is also probable that mothers with poor nutritional status will deliver low-weight babies. The RCH survey data on birth weight observed that about 20 per cent of the infants were below 2,500 grams. In many districts more than one-fifth of the infants were reportedly under-weight. The lowest proportion of under-weight babies was in Bangalore Urban (9 per cent) and the highest in Dharwad district (39 per cent). More than half of the districts had more than 20 per cent under weight babies,

The weight of an infant at birth is an important measure of the nutritional status of the mother and an indicator of the child's survival rate.

TABLE 6.24
Percentage of ever married women (15-49 years) with iron deficiency - Karnataka: 1999

(Per cent)

Background characteristics		Any anaemia	Mild	Moderate	Severe
Age	15-19	50.7	26.8	22.4	1.5
	20-24	45.7	30.8	13.0	1.9
	25-29	40.0	26.1	11.2	2.6
	30-34	40.6	24.5	13.9	2.1
	35-39	40.7	24.8	12.2	2.7
Residence	Urban	35.7	24.5	9.8	1.3
	Rural	46.0	27.8	15.4	2.8
Caste	SCs	46.6	26.0	18.2	2.4
	STs	45.9	27.3	16.4	2.1
Standard of living	Low	51.3	30.4	17.1	3.8
	Medium	41.2	26.4	13.1	1.7
	High	32.6	21.9	9.0	1.7
Total		42.4	26.7	13.4	2.3

Source: NFHS-2, Karnataka, 1998-99.

TABLE 6.25
Anaemia among women in states: 1999

(Per cent)

State	Any anaemia	Mild	Moderate	Severe
Andhra Pradesh	49.8	32.5	14.9	2.4
Assam	69.7	43.2	25.6	0.9
Karnataka	42.4	26.7	13.4	2.3
Kerala	22.7	19.5	2.7	0.5
Maharashtra	48.5	31.5	14.7	2.9
Tamil Nadu	56.5	36.7	15.9	3.9
India	51.8	35.0	14.8	1.9

Source: NFHS-2, India, 1998-99.

which is a grim testimony to the incidence of female under nutrition.

State interventions in nutrition

The Centre-state co-financed Integrated Child Development Scheme (ICDS) was launched in the country in 1975 on an experimental basis in 33 blocks, one of which was T. Narsipura of Mysore district (Karnataka). The scheme has multiple objectives of which the improvement of the nutrition and health of children (0-6 years), pregnant women and nursing mothers is a significant component. There are now 185

ICDS projects in the state. Self-sufficiency in food production in a country will not reduce malnutrition among the poor particularly among children and women unless food is available at affordable prices. The Public Distribution System (PDS) ensures that food grain procured and stocked by the Food Corporation of India is distributed to state governments for distribution through fair price shops. In 2004, the Karnataka government introduced the distribution of 10 kilograms of rice and wheat at Rs.3 per kg to each yellow cardholder. While this intervention will have a considerable impact on the diet of the poor, it must be matched by building nutrition awareness so that people can supplement their diets with nutritious, locally available, vegetables and fruits. *Akshara Dasoha*, the midday meals programme for school children, which was introduced in the seven educationally backward districts of north Karnataka in 2002-03, and was subsequently upscaled to cover the entire state in 2003-04, is a major initiative which will substantially enhance young children's nutrition levels.

Public expenditure on healthcare

Despite the importance of public healthcare services to the poor who are its primary clients, expenditure on health and family welfare in Karnataka has not increased over the years and, in reality, it marginally declined from about one per cent of GSDP in 1990-91 to about 0.88 per cent of GSDP in 2002-03. It is apparent that family welfare is not receiving adequate budgetary support: medical and public health expenditure grew by about 26 per cent, family welfare expenditure increased by only 10 per cent with two negative growth years during 1998-99 and 2002-03.

Within medical and public health, there has been an increase in the share of expenditure of urban health services, rural health services and medical education, training and research (Figure 6.1). The share of urban health services in medical and public health has increased from 38 per cent in 1990-91 to 44 per cent in 2002-03. The share of rural health services in medical and public

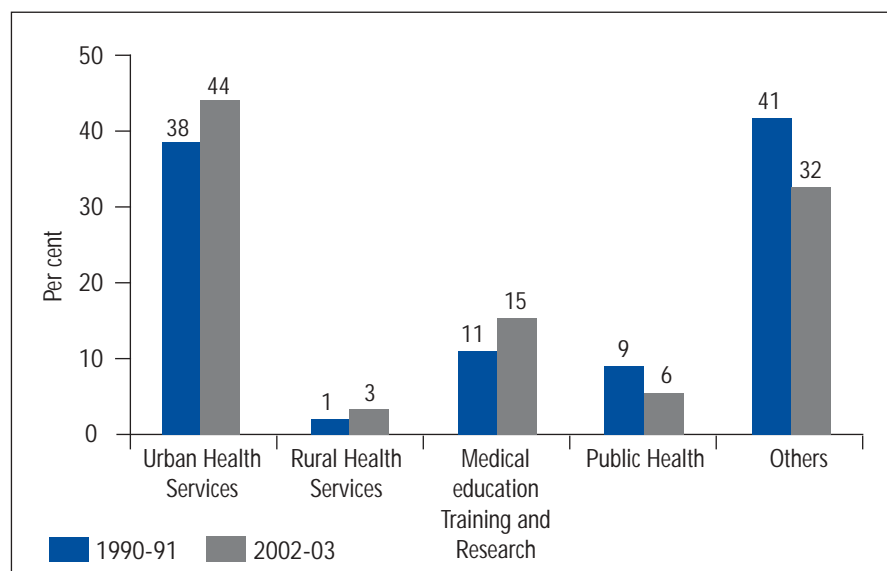
health increased from about one per cent to only about three per cent, which is low, given the gap between rural and urban health outcomes. Expenditure on medical education, training and research increased from about 11 per cent in 1990-91 to 15 per cent in 2002-03. Overall, however, there has been a decline in expenditure on public health during the decade. The share of public health in the budget has declined from around nine per cent in 1990-91 to about six per cent in 2001-02 (Figure 6.1).

While the expenditure on primary healthcare has remained stagnant, tertiary healthcare is increasingly getting a bigger share of resources. This trend is unfortunate since investment in primary healthcare represents better value for money than spending on secondary and tertiary facilities. Primary healthcare constitutes a social priority sector as it targets rural areas and the poor who cannot afford expensive private medical care. The overall status in primary healthcare expenditure is reflected in the state's performance with regard to several health indicators.

The financial statement of the Department of Health and Family Welfare (excluding Medical Education, Training and Research) provided in the 'Departmental Medium Term Fiscal Plan' (DMTFP) shows that in 2001-02, about 69 per cent of the revenue expenditure was employee-related and towards transfer payments. Employee-related expenditure constituted about 31 per cent and transfer payments about 38 per cent of revenue expenditure in 2001-02 (Table 6.26). This classification underestimates the expenditure related to employees because assistance to local bodies, a substantial part of which is salary, is included in transfer payments. As little as 19.55 per cent was spent on supplies, services and maintenance all of which are important inputs for improving the quality of services and ensuring optimal outreach and efficient delivery.

In 2002-03, about 32 per cent of the total expenditure on medical and public health was spent through local bodies. Districts with poor health indicators such as Belgaum, Dharwad, Raichur and Koppal often receive less financial

FIGURE 6.1
Components of medical and public health expenditure in Karnataka:
1990-91 and 2002-03



BOX 6.3

Yashaswini health insurance for farmers

Yashaswini, a cooperative farmers' healthcare scheme is a landmark initiative of the Karnataka government. Launched in June 2003, the scheme has for the first time, addressed the major health concerns of rural people who typically have no health insurance. A farmer who has been a member of a co-operative society for at least 6 months can avail of the benefits of the scheme by paying a nominal premium of Rs.60 per annum. The spouse and children are also eligible to get benefits if they pay a premium of Rs.60 per person.

Beneficiaries under this scheme can approach a pre-identified network hospital for treatment. The network hospital extends free out-patient services and diagnostic tests at concessional rates. If surgery is required, then the network hospital takes necessary steps. The beneficiary need not pay for surgery if the cost is below Rs.1.00 lakh for a single surgery and below Rs.2.00 lakh for multiple surgeries. The network hospital gets its fees from the *Yashaswini* Trust through the Family Health Plan Limited which is the implementing agency for this scheme.

Under the scheme, so far over 1,600 surgical procedures costing up to Rs.1.00 lakh for a single surgery and Rs.2.00 lakh for multiple surgeries are free for members. In the first phase, 16.01 lakh farmers enrolled as members and over 20 lakh farmers enrolled in the second phase. 164 network hospitals have been identified all over the state under this programme. About 1.10 lakh farmers have used the services provided under this scheme. About 86,000 free out-patient consultations and 24,122 surgeries have been conducted during 2003-04 and 2004-05. A payment of about Rs.28.56 crore has been made to network hospitals as fees for cost of treatment.

TABLE 6.26

Revenue expenditure in health and family welfare expenditure (excluding medical education, training and research): 2001-02

Revenue Expenditure Head	Revenue Expenditure (Rs. lakh)	Revenue Expenditure as per cent of total expenditure
Employee related	22084.03	30.64
Supplies and services	13335.17	18.50
Maintenance	756.46	1.05
Transfer payments	27333.3	37.93
Others	8556.95	11.87
Total revenue expenditure	72065.91	100.00

Source: Departmental Medium Term Fiscal Plan: 2003-04 to 2006-07, Department of Health and Family Welfare Services, Karnataka.

TABLE 6.27

Karnataka and selected states: Per capita health expenditure

State	Per capita health expenditure (Rs.)	
	2001-02	2003-04
All-India	184.97	214.62
Karnataka	205.45	238.38
Andhra Pradesh	179.45	208.22
Kerala	237.45	275.51
Tamil Nadu	195.44	226.77
Maharashtra	189.39	219.75
Punjab	253.83	294.52

Source: Planning Commission, Mid Term Appraisal, 2005.

assistance than districts with good indicators such as Chikmagalur, Kodagu and Uttara Kannada. This disparity indicates that equitable and consistent norms for allocating funds to Zilla Panchayats must form the basis of devolution of funds.

Despite the decreasing trend in outlays for financing healthcare, Karnataka ranks third among major states in its health expenditure (Table 6.27). This suggests that overall, most states do not provide adequately for health. A matter of concern is the fact that Karnataka has lower health indicators than some states that are spending less and the question of targeting expenditure to regions/districts and vulnerable sub-populations needs to be seriously addressed by government.

Government health infrastructure

Over time, Karnataka has seen considerable expansion in health infrastructure in terms of both trained professionals and institutions. Between 1985 and 2003, the number of primary health centres (PHCs) increased from 365 to 1,696, sub-centres increased from 4,964 to 8,143 and community health centres (CHCs) from 27 to 253. However, this expansion was not evenly distributed across the state as is evident from the institution and population ratio. The rural population covered by a PHC is about 30,000 (20,000 in hilly and tribal areas) and by a sub-centre, about 5,000 (3,000 in hilly and tribal areas). The region-wise distribution reveals that south Karnataka has a better ratio than either the Bombay Karnataka or Hyderabad Karnataka regions. This is also true of the bed-population ratio. Sub-centre population coverage in Hyderabad Karnataka is about 32 per cent less than south Karnataka and 27 per cent below Bombay Karnataka. The corresponding figures in terms of the PHC population ratio are 26 per cent and 16 per cent less than south Karnataka and Bombay Karnataka respectively. With reference to the bed-population, infrastructure in Bombay Karnataka region is 37 per cent and in Hyderabad Karnataka, 30 per cent less than southern Karnataka. The doctor-population ratio is 1:3240 and doctor patient ratio is 1:2167 showing an improvement over 1985 (Table 6.28). The expansion of coverage of health infrastructure

BOX 6.4

Universal Health Insurance Scheme

The Universal Health Insurance Scheme (UHS) is a Government of India programme to provide health insurance cover to population below poverty line. Under this programme any individual or a family of 5 or 7 members belonging to below poverty line category can subscribe by paying an annual premium of Rs.365, Rs.548 and Rs.730 which Govt. of India subsidises by Rs.200, Rs.300 and Rs.400 respectively. From 2005-06, the Government of Karnataka will pay an additional subsidy of Rs.150, Rs.200 and Rs.250 under this programme. This reduces the premium payable to Rs.15, Rs.48 and Rs.80 respectively. Initially the state government will cover 2.5 lakh SC/ST families who are members of *Stree Shakti* self-help groups.

The beneficiaries of this scheme will get an insurance cover of Rs.30,000 for the whole year for certain ailments excluding pre-existing diseases and delivery in case of expectant mothers. United Insurance Company is the nodal implementing agency of this scheme.

facilities is an important step in the provisioning of an efficient healthcare delivery system. It should be supported by providing adequate drugs and equipment, maintaining institutions, and ensuring that health personnel are accountable to the people they serve. A more equitable distribution of institutions is also very necessary to bridge regional disparities in health and nutrition levels.

The bed–population ratio (public and private) is lowest in Kerala (382) followed by Tamil Nadu (1,120), Karnataka (1,209) and Andhra Pradesh (2,536). There are more than 35,000 sanctioned posts of doctors, technicians and para-medical staff of which about 25,500 have been filled. The government has taken steps since the early 1990s to ensure that all vacancies in the cadre of doctors and nurses are filled, even resorting to local contract appointments to ensure that vacancies in the northern and *malnad* districts are filled (Table 6.29). Currently about 10.5 per cent of the posts of medical officers are vacant and districts with a high number of vacancies are Uttara Kannada (24 per cent), Kodagu (21 per cent), Raichur (20.7 per cent) and Chikmagalur (20.5 per cent). In most of the northern districts vacancies of doctors are above the state average. Doctors and other trained para-medical staff are reluctant to work in north Karnataka districts like Raichur and Gulbarga or in the *malnad* districts of Kodagu and Chikmagalur, preferring the more salubrious climate of Bangalore-Mysore. The number of vacancies in the cadre of female health assistants is also rather high. Coupled with absenteeism this leads to a scenario where institutions function at below capacity levels and are unable to fulfil local needs. Institutional deliveries require that doctors and nurses be available at all times to deal with possible emergencies. Kodagu and Chikmagalur, which have good HDIs, for instance have an IMR above the state average, which can be partly attributed to lack of staff.

Public–private participation

Karnataka has initiated several measures to ensure greater community participation in the management of healthcare. The government has constituted *Arogya Raksha Samithis* in district and taluk hospitals to oversee hospital

BOX 6.5

Round-the-clock nursing services

In a major move towards reducing infant and maternal mortality, Karnataka has decided to provide round-the-clock nursing services at the primary health centre level. This service will ensure more institutional deliveries and improved care of newborn babies. Government has identified 399 primary health centres in 39 most backward taluks of the state where this new programme will be piloted.

TABLE 6.28
Regions and selected ratios

Indicators	State/Region	Rates
Rural population covered by a sub-centre	Karnataka	4285
	Bombay Karnataka	4875
	Hyderabad Karnataka	5061
	South Karnataka	3833
Rural population covered by PHC	Karnataka	20780
	Bombay Karnataka	22275
	Hyderabad Karnataka	24169
	South Karnataka	19133
Population per bed	Karnataka	1221
	Bombay Karnataka	1499
	Hyderabad Karnataka	1413
	South Karnataka	1089
Doctor–population ratio (state)		1:3240
Doctor–patient ratio (state)		1:2167
ANM–population ratio (state)		1:3611
Nurse–bed ratio (state)		1:9

Source: Directorate of Health and Family Welfare Services, Karnataka.

TABLE 6.29
Vacancy position of medical officers and other paramedical staff

Category	Total sanctioned posts	Currently working	Vacant as on 30/06/05	Percentage of vacant to sanctioned posts
Medical Officer	5069	4538	531	10.5
Dental Surgeons	229	209	20	8.7
Sr. Health Asst. (Male)	1302	837	465	35.7
Sr. Health Asst. (Female)	1389	1148	241	17.4
Jr. Health Asst. (Male)	5853	4594	1259	21.5
Jr. Health Asst. (Female ANM)	10255	9382	873	8.5
Pharmacist	2198	1791	407	18.5
Staff Nurse	4717	4367	350	7.4
Others	3361	2673	688	20.4

Source: Directorate of Health and Family Welfare Services, Karnataka.

BOX 6.6

Public–private partnership

Under the public–private initiative in the state, so far 80 primary health centres have been identified and 28 have been assigned to private medical colleges and NGOs for complete management and it is now proposed to assign another 100 primary health centres during the current year. Under this scheme NGOs and private medical colleges can appoint their own staff to run these centres. Internal evaluation of this arrangement has shown that there has been considerable improvement in the management of these primary health centres.

maintenance and decide how to use the money collected as user charges. In another innovative step, the Health department has mobilised the support of self-help groups (such as *Stree Shakti groups*) to spread awareness about basic healthcare and to distribute medicines for common ailments. The management of 28 PHCs has been transferred to NGOs and private medical colleges and government provides 75 per cent of the total expenditure as financial support. This is an important step towards promoting private participation in healthcare meant for the poor. The management of the Rajiv Gandhi super speciality hospital in Raichur has been entrusted to Apollo hospitals for 10 years. The Karnataka Health Promotion Trust is funded by the Bill Gates Foundation for focused attention on the control of HIV/AIDS and rehabilitation of patients.

Private sector and healthcare

The healthcare services provided by the private and corporate sector are largely concentrated in urban areas. Despite this constraint, data (NSSO survey)

shows that there is greater dependency on private healthcare services rather than on government for non-hospitalised treatment (i.e. outpatient care) in both rural and urban areas for all southern states and all-India. Among the southern states, rural Kerala has the highest proportion of cases treated in government hospitals followed by rural Karnataka. In urban areas, however, the number of cases treated in government healthcare facilities is the lowest in Karnataka across all southern states as well as all-India (Table 6.30).

NFHS 2 data shows that utilisation of public health facilities and institutions for child delivery is highest (78.2 per cent) for women with low and middle standards of living. Utilisation of private healthcare facilities by SCs and STs is also very low. There cannot be a better indicator of the primacy of the state's healthcare systems as the most favoured provider of healthcare for the poor.

Private sector healthcare is a mixed scenario, with high-tech speciality hospitals coexisting with seedy

TABLE 6.30

Proportion of persons receiving treatment for ailments and per capita public expenditure on health

State	Percentage of ailments (non-hospitalised) treated				No. treated in govt. hospital (per '000)		Population per hospital bed	Per capita public expenditure on health (Rs.)
	Rural		Urban		Rural	Urban		
	Govt.	Other sources	Govt.	Other sources				
Karnataka	26	51	17	74	458	298	1209	54
Andhra Pradesh	22	53	19	68	225	362	2536	40
Kerala	28	61	28	62	401	384	382	71
Tamil Nadu	25	54	28	65	411	357	1120	77
India	19	64	20	72	453	431	1412	70

Source: NSS report – 1995-96 (No. 441).

clinics run by quacks. The services available to the poor and marginal groups in private health facilities may not necessarily be superior to what public healthcare offers but it has certain advantages for users. Public healthcare is often associated with lack of staff, medicines and equipment. Above all, there is chronic absenteeism among providers and rent seeking. Private healthcare may end up sending the poor into debt, but its merit lies in being available when needed. Improved governance will certainly result in better utilisation of public health facilities by those for whom it was designed.

Achieving the objectives of Vision 2020

The foregoing analysis of population, health and nutrition provides a reasonably bright picture of achievements. The various strategies of the state have had a positive impact on health as reflected in the fact that most of the health indicators are above the all-India average. Disparities between regions, men and women, and between social groups have also narrowed. Although the state must now focus on matching the performance of neighbours like Kerala, it can be said that Karnataka is moving in the right direction and the targeted level of achievements in the Karnataka Vision 2020 document is likely to be achieved if the tempo is enhanced through increased financial outlays and sustained good governance. Lack of adequate budgetary support and a need to improve governance, especially at the cutting edge are factors that impact critically on health outcomes.

One crucial path to achieving the goals set out in Vision 2020 lies in targeting disparities of region, caste and gender.

- The Hyderabad Karnataka region, which has poor health indicators compared with other regions, is underserved in terms of infrastructure and funding. Literacy rates are low, the percentage of agricultural wage labour is significantly large, and there is a concentration of SC and ST populations. Similarly, there are certain districts like Bijapur in Bombay Karnataka, Chamrajnagar, Kolar and Tumkur in south Karnataka, which have levels of performance below their regional average. These areas will need

BOX 6.7

Tele-medicine project

The Karnataka Tele-medicine Project is a joint venture of the Indian Space Research Organisation (ISRO) and the Government of Karnataka to provide expert medical services to rural and remote areas. Hospitals/health centres in remote areas are linked via INSAT satellites with super speciality hospitals thus providing patients in rural/remote places with access to specialist doctors for consultation and referral services.

The tele-medicine system consists of customised medical software integrated with computer hardware, along with diagnostic instruments connected to VSAT at each location.

The project was started on a pilot basis wherein Chamrajnagar district hospital and Vivekananda Memorial Hospital (an NGO-run rural health unit) at Saragur in H.D. Kote taluk, Mysore district were linked with Narayana Hrudayalaya, Bangalore.

Tele-medicine is used for the following purposes:

- Remote consultation;
- Second opinion;
- Interpretation services;
- Continuing education and exchange of clinical information; and
- Home care.

Karnataka's tele-medicine project envisages linking of all district hospitals, hospitals run by trusts as well as a few taluk level hospitals with super speciality hospitals such as Narayana Hrudayala, Bangalore (Cardiology), Jayadeva Institute of Cardiology, Bangalore, St. John's Medical College hospital, Bangalore (Paediatrics), NIMHANS, Bangalore (Neurology), JSS Institute of Medical Science, Mysore (Nephrology) and Samatvam Institute of Diabetology, Bangalore (Diabetics). The Government is extending this project to 13 more districts and the remaining districts will be covered in a phased manner. The government of Karnataka will provide the required personnel and space for the project while ISRO will provide VSAT connection and equipment.

strategies tailored to address the specificity of their deficiency in health performance.

- Sub-populations such as the Scheduled Castes and Tribes have a very poor health profile compared with the rest of the population. Their CBR, CDR and IMR are worse than the state average. Their utilisation of healthcare facilities is also poor. Maximising coverage of these vulnerable groups will have promising outcomes.
- Women should be a strong focus area because so many health issues arise from gender inequity and their lack of control over their reproduction. High MMR and IMR and insufficient nutrition point to the subordinate and marginal status of women.
- Enhancing health expenditure is critical to improvements in healthcare services. Health

One crucial path to achieving the goals set out in Vision 2020 lies in targeting disparities of region, caste and gender.

TABLE 6.31
Karnataka Health Vision 2020: Targets

Indicators	Year of reference	Status as on 2001	Targets for 2020
Infant mortality rate	SRS 1999	58	25
Under-5 mortality rate	NFHS-2	69	35
Crude birth rate	SRS 1999	22.3	13
Crude death rate	SRS 1999	7.7	6.5
Maternal mortality rate	SRS 1998	195	90
Life expectancy at birth (years)	1996-2001		70
Male		61.7	
Female		65.4	
Total fertility rate	NFHS - 2	2.13	1.6
Percentage of institutional deliveries		51.1%	75%
Percentage of safe deliveries		59.2%	>95%
Percentage of low birth weight	1994	35%	10%
Percentage of mothers who received ANC	2000	86.3%	100%
Percentage of eligible couples protected	2000	59.7%	70 %
Percentage of children fully immunised	NFHS - 2	60	90%
Anaemia among children (6–35 months)	NFHS - 2	70.6 %	40 %
Nutritional status of children			
Severe under-nutrition	Gomez 1996	6.2 %	2 %
Moderate under-nutrition		45.4 %	25 %
Mild under-nutrition		39 %	43 %
Normal		9.4 %	30 %
Sex ratio	2001	965	975
Sex ratio (0–6 years)	2001	946	970

Since more than 70 per cent of total infant deaths occur at the neonatal stage, interventions must focus on several strategies to prevent neonatal deaths.

- expenditure actually declined from 1 per cent of GSDP in 1990-91 to 0.88 per cent in 2002-03. Expenditure on rural healthcare must be stepped up since the most vulnerable segment of the population resides here. Expansion in medical and tertiary education must not occur at the expense of primary healthcare.
- Population growth will have to come down to about 1.0 per cent per year from the current 1.7 per cent. This can be achieved by reducing CBR to about 16 to begin with (the target is 13), through family planning and reducing CDR to less than 6 through improved health. This would stabilise the population.
- Since more than 70 per cent of total infant deaths occur at the neonatal stage, interventions must focus on several strategies to prevent neonatal deaths through encouraging spacing methods particularly in young couples and combining community healthcare with institutional facilities. The causes of neonatal deaths are both exogenous and endogenous. Many are preventable through early detection (e.g. low birth weight, obstructed labour, asphyxia) and immunisation, which is why full ANC of the target population should be 100 per cent. Filling up all vacancies of ANMs and medical officers, training, orientation, and supervision are essential.
- Complete immunisation among children below two years must be achieved in spite of substantial investment. High-risk districts such as Raichur, also have the least coverage

- and achievement of targets here will ensure universal immunisation in the state.
- High rates of MMR can be best minimised by ensuring total ANC and universal coverage by skilled birth assistants and institutional obstetric care for problematic cases. Here rural areas are most in need of attention with a high 61.5 per cent of deliveries taking place at home. More 24-hour facilities to deal with medical emergencies will have to be introduced.
 - The magnitude of under-nutrition and iron deficiency in Karnataka, as revealed by recent data squarely signals that nutrition is a major health issue in the state. The targets for 2007 include reduction of severe malnutrition among children from 6.2 per cent to 3 per cent and moderate malnutrition from 45 per cent to 30 per cent, and reduction in newborn children with low birth weight from 35 per cent to 10 per cent. This ambitious plan requires a proper strategy to promote low-cost, nutritious diets using locally available food to supplement food security through the PDS while poverty reduction programmes add to people's income. The impact of the ICDS has been diluted by its inability to target high-risk cases.
 - The quality of healthcare services seems to be on the decline as reflected by the low ANC coverage and the fact that only 50 per cent of deliveries are institutional deliveries. Public healthcare will have to improve quality by ensuring that all staff is in place especially in regions/districts with high IMR and MMR, maintaining buildings and equipment and ensuring an adequate supply of medicines.
 - Good governance in health means that service providers will function in a transparent and responsible manner. Absenteeism and graft must be dealt with firmly.
 - Public health programmes in the state have not yet managed to control diseases like malaria, tuberculosis, jaundice, gastroenteritis, and the incidence of some of these diseases has risen in recent times. Better sanitation and a protected source of drinking water are critical inputs.
 - Data on morbidity is grossly deficient and data on morbidity at all health facilities should be compiled at district level. District-wise data on MMR and IMR are not readily available.
 - Gram panchayats should be involved in managing healthcare by developing a set of village level indicators that can be monitored regularly. Containing HIV/AIDs will require strenuous efforts from local bodies and communities.

Promote low-cost, nutritious diets using locally available food to supplement food security through the PDS while poverty reduction programmes add to people's income.

Gram panchayats should be involved in managing healthcare by developing a set of village level indicators that can be monitored regularly.