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Environmental health infrastructural management for smart India

Umakant[1], Madhu Raikwar[1] R.S. Mishra[2]

[1]DTE. General of Health Service, Ministry of Health and Family Welfare, Govt. of India, New Delhi-110011
[2]Department, of Mechanical production, Industrial and Automobiles Engineering, DTU Delhi-110042, India

Abstract

Health system in India depends upon mainly on the central Government, state Government or public sector for financing and formulation of policies and service delivery of health infrastructure. The health system is faced a lot of challenges, its display when the budget distribution in terms of national resource allocation. Less allocation for budget in health sector also affecting health infrastructure in India. Therefore, this is a serious problem affecting the health infrastructure. In its early phase, the health system in India was primarily focused on providing curative services targeting maternal, child and newborn health. Since the 1990s, with the development of modern science and technology and with the greater role of United Nations agencies and non-government organizations, the health systems gradually shifted its emphasis equally on health promotion and preventative services. Therefore, the health services also expanded its infrastructure reach. This paper is based on an extensive review of vital role and improvement in the health infrastructure in rural and urban India in India and data have been collected from various sources i.e. Govt and non Govt agencies.

Keywords: Health Infrastructural Management, National health overview, Hospital waste management

1. Introduction

Health infrastructure is an important factor for understanding the health care delivery provisions and welfare mechanism in a country. Infrastructure has been described as the basic support for the delivery of public health activities. It also signifies the investments and priority accorded to create the infrastructure in public and private sectors. A Health infrastructure, which can provide a good quality facilities, is essential for development of health sector both rural and urban sector. Health infrastructure data is also requiring for timely and accurate information from various sources for monitoring of the health status of the population, the provision of services as to the coverage and utility, drugs stocks and consumption patterns, equipment status and availability, finances, personnel, etc. on a regular basis. Accurate, relevant and up-to-date data on infrastructure is essential to health service managers if they are to recognize weaknesses in the health infrastructure provision and take actions that will improve service delivery.

2. Hospital waste management in health Infrastructure

Hospital waste management play important role in the health infrastructure because Biomedical wastes are affecting a lot of people, which include medical doctors, nurses, health-care auxiliaries and hospital maintenance personnel, patients in hospitals or receiving home care, visitors in the hospitals, workers in supportive services, such as cleaners, people who work in laundries, porters transporting waste to a treatment or disposal facility, workers in waste-management facilities in our environment. Improper disposal practices of hospital waste affects the people who come in direct contact with it. Health care system is a place where diagnosis, treatment or immunization of human beings or animals is provided irrespective of type and size of health treatment system, and research activity pertaining thereto; management" includes all steps required to ensure that bio- medical waste is managed in such a manner as to protect health and environment against any adverse effects due to handling of such waste "hazardous waste" means any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances. The in India, Ministry of Environment, Forest and Climate Change is the lead agency

Corresponding author: R.S. Mishra
Email Id: rsmishra@dtu.ac.in

for framing the rules, as the rules have been made under the Environment Protection Act (EPA) 1986 [1]. The drafting committee includes other important stakeholders such as members from the Ministry of Health, the Indian Medical Association, members from leading public and private hospitals, the National AIDS Control Organization (NACO), CPCB, representatives from SPCB, CBWTFs, NGOs, etc. The Ministry of Health and Family Welfare is the implementing body. The Central and the state pollution control boards are also responsible for monitoring the health-care facilities. All health establishments of premises for a safe, ventilated and secured location for storage of segregated biomedical waste in colored bags or containers According to bio-medical waste management rules 2016, waste should be segregated into 4 categories viz. yellow, red, white and blue. Yellow – human and animal anatomical waste, placenta, fetus, soiled waste, pretreated microbiological and biotechnological waste, pharmaceutical and cytotoxic waste; linen and mattresses are discarded into yellow non-chlorinated plastic bags. These bags are to be incinerated by the common bio-medical waste treatment facility (CBMWTF). Red – all recyclable waste such as tubing, bottles, IV sets, vacutainers, catheters, gloves, etc. are discarded into red non-chlorinated plastic bags. These bags are to be autoclaved and shredded and then sent to authorized recyclers. White – this puncture-proof plastic container is for discarding sharps waste such as needles, syringes, scalpel, blades, etc. This waste is also autoclaved and then sent to an appropriate site (landfill, sharp pit or any iron foundry). Blue – a blue cardboard container is for glassware and metallic body implants. This waste must be disinfected and then sent for recycling. Health-care facilities as well as the CBWTFs must provide required vaccinations and personal protective equipment to the staff handling medical waste. Training and an annual health check-up should be conducted at least once a year. Provide training to all its health care workers and others, involved in handling of bio medical waste at the time of induction and thereafter at least once every year and the details of training programs conducted, number of personnel trained is available in the annual report. Immunize all its health care workers and others, involved in handling of bio-medical waste for protection against diseases including hepatitis-B and tetanus that are likely to be transmitted by handling of bio-medical waste, in the manner as prescribed in the national immunization policy. To ensure occupational safety of all its health care workers and others involved in handling of bio-medical wastes by providing appropriate and adequate personal protective equipment. establish a system to monitor the activities related to bio-medical waste management, either through an existing committee or by forming a new committee and the committee shall meet once in every six months and the record of the minutes of the meetings of this committee shall be submitted along with the annual report to the prescribed authority and the healthcare establishments having less than thirty beds shall designate a qualified person to review and monitor the activities relating to bio-medical waste management within that establishment and submit the annual report. Health-care facilities as well as the CBWTFs must provide required vaccinations and personal protective equipment to the staff handling medical waste. Training and an annual health check-up should be conducted at least once a year. All the HCFs, Department of Health of the State/Union Territory and ministry of health, are responsible for the implementation of the rule. In 2015, Kayakalp, an initiative for awards to public health facilities, was launched by the Ministry of health and family welfare. Apart from encouraging public health facilities to keep a clean and hygienic environment, they are encouraged to develop systems for proper bio-waste disposal under the mission. According to suggestions for improvement in Health Infrastructure System [2].

(i) Geo-coding: It involves the introduction of data systems for monitoring health status. Such systems would allow entities at all levels to have a geographic information system capable of showing diseases portrayed through maps, risk of spread of diseases, environmental hazard and service delivery.

(ii) Health policy budgets should include and integrate infrastructure plans. Mere request for infrastructure funding may face opposition because they are generic in nature and do not have the effect of directly addressing health problems which are overt in nature such as prevention of spread of infectious diseases, maternal and child health etc.

(iii) Reduce urban bias: Health facilities should be developed in the rural sector by public authorities and incentives for the same should be provided to private bodies. Most public health facilities have poor infrastructure as regards to equipment used for medical tests (e.g. X-ray, blood tests, and other complicated tests). Such equipment which is mostly imported is very costly.

(iv) Government can solve this problem by reducing or complete waiver of import duties and taxes. The equipment should be made available to the public at large by public-private cooperation and by encouraging indigenous production of such equipment by both public and private bodies at competitive prices.

(v) A substantial increase is needed in the number of medical education institutions and the government should make provisions for better quality of medical professionals to serve the masses.

The Government announced in the budget session [3], the two major initiatives taken in health sector, under ayush man bharat program. The main aim of this program is making path breaking interventions to address health holistically, in primary, secondary and tertiary care systems, covering both prevention and health promotion. The new initiatives in health sector, are as follows.

2.1 Centre for Health & Wellness

The National health policy, 2017 has envisioned health and wellness centres as the foundation of India's health system. Under this policy, 1.5 lakh centres will bring health care system closer to the homes of people. These centers will provide comprehensive health care, including for non-communicable diseases and maternal and child health services. These centres will also provide free essential drugs and diagnostic services. The Budget has allocated Rs.1200 crore for this flagship program. The contribution of private sector through CSR and philanthropic institutions in adopting these centres is also envisaged.

2.2 National health protection scheme

The second program of Ayushman Bharat comes under National Health Protection Scheme. This scheme will cover over 10 crore poor and vulnerable families in which approximately 50 crore beneficiaries are providing coverage up to 5 lakh rupees per family per year for secondary and tertiary care hospitalization. This will be the world's largest government funded health care program. Adequate funds will be provided by the Govt. for smooth implementation of this program. According to finance ninister statement, that these two health sectors initiative under Ayushman Bharat Program will build a new green healthy India (NGHI-2022). To ensure enhanced productivity in health infrastructure in India, these Scheme will also generate lakhs of jobs, particularly in the health sector.

3. Method for improving health sector

3.1 Role of CBHI for improving in health sector[4]

The role of CBHI in health statistics is to improve country, regional and global health information. This information is vital for public health decision making, health sector reviews, planning and resource allocation and program monitoring and evaluation at the National, State, District and Institutional levels and to regularly track the progress of the country in achieving the National health outcome indicators and in identifying areas and populations which lag on health indicators with sufficient accuracy, to enable remedial action. In response to the health challenges faced, government realizes that effective health resource management, allocation and monitoring based on real ground evidence would be imperative to address aforesaid challenges and provide accessible and acceptable quality health care services for the community. Government understands the constrained on public health resources, and therefore intends to judiciously utilize the health resources. Therefore, it is essential to allocate resources based on real world data and do regular monitoring and impact assessment of the allocated resources. Private sector health infrastructure and service delivery continues to be a blind spot for government. It is critical to factor in the reach and penetration of private sector health resources, while planning for public health resources and infrastructure. Also, to reach hitherto unreached segments of the population, where public health resources are constrained, opportunities to tie up with private sector are to be explored for better service delivery. CBHI envisions providing ready information on various health indicators for India, which are of great significance to the planners, policy makers, health administrators, research workers and others engaged in raising the health and socio-economic status of the community. The many people of India, particularly in rural areas, remain with little access to health care facilities. Nevertheless, it must be government faces major issues concerning its capacity to plan and implement a broad range of health infrastructure in India.

3.2 National environmental health Infrastructure[4]

India's population, as per census 2011 stood at 12108.5 lakhs (6232.7 lakhs males and 5875.8 lakhs females). Out of the entire census till date, the average annual exponential growth rate has been negative only for the decade 1911-21. During this interval, population declined marginally due to great influenza epidemic and two successive bad harvests in West Bengal. The sex ratio of India during 1901 was 972 females per 1000 males. Since then, it has continued to decline decade over decade to 926 females against 1000 male in 1991 (except in 1981). The sex ratio has further improved from 1991 it was 933 and 943 female against 1000 female in 2001 and 2011 respectively in the country. The sex ratios of 18 States/UTs were above national average while 17 States/UTs have registered below national average. The highest sex ratio of 1084 females per 1000 males was reported by State of Kerala followed by Puducherry (1037/1000), Tamil Nadu (996/1000), Andhra Pradesh (993/1000), Chhattisgarh (991/1000) and Meghalaya (989/1000).

The lowest sex ratio of 618 females per 1000 males was reported by the UT of Daman & Diu followed by Chandigarh (818/1000), NCT of Delhi (868/1000), Andaman & Nicobar Islands (876/1000), Haryana (879/1000), Jammu & Kashmir (889/1000), Sikkim (890/1000) and Punjab (895/1000). As shown below fig-1. The highest population density of 11320 populations per square kilometer was reported by NCT of Delhi whereas Arunachal Pradesh has reported the lowest population density of 17. The graphic representation of the population density of the country is given at Fig. 2.

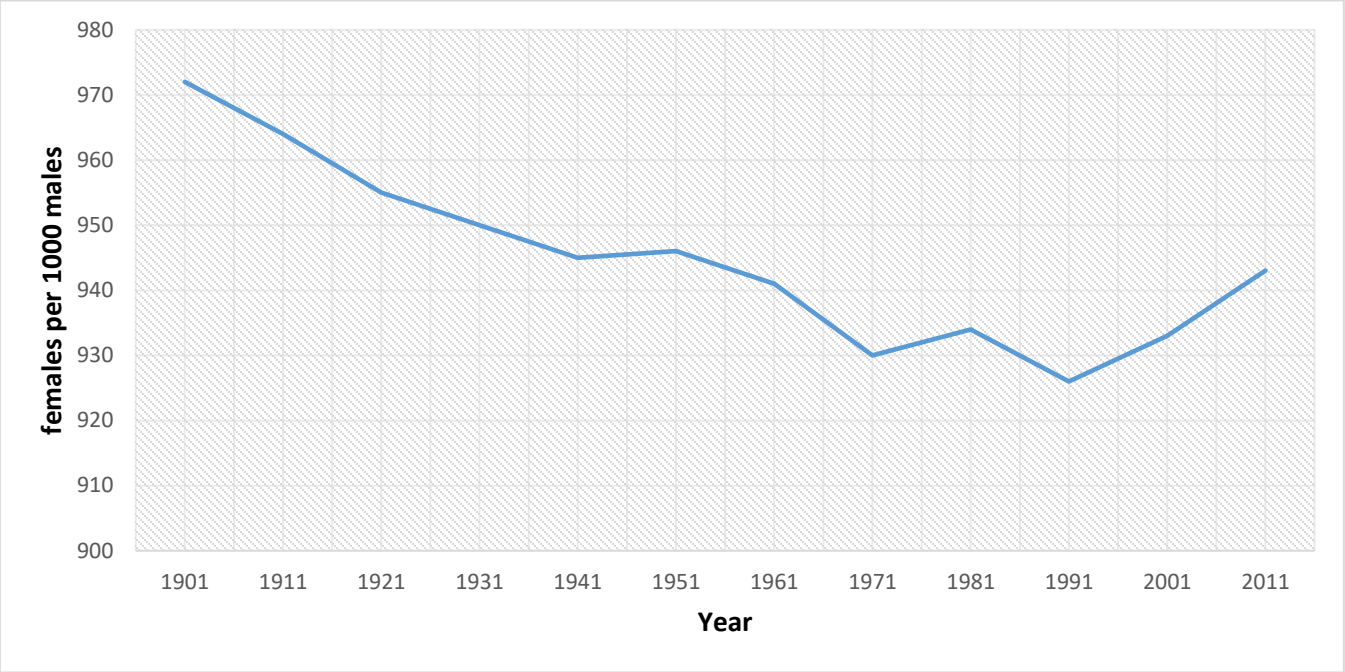

Figure 1: Sex Ratio (Females per 1000 males) [4]

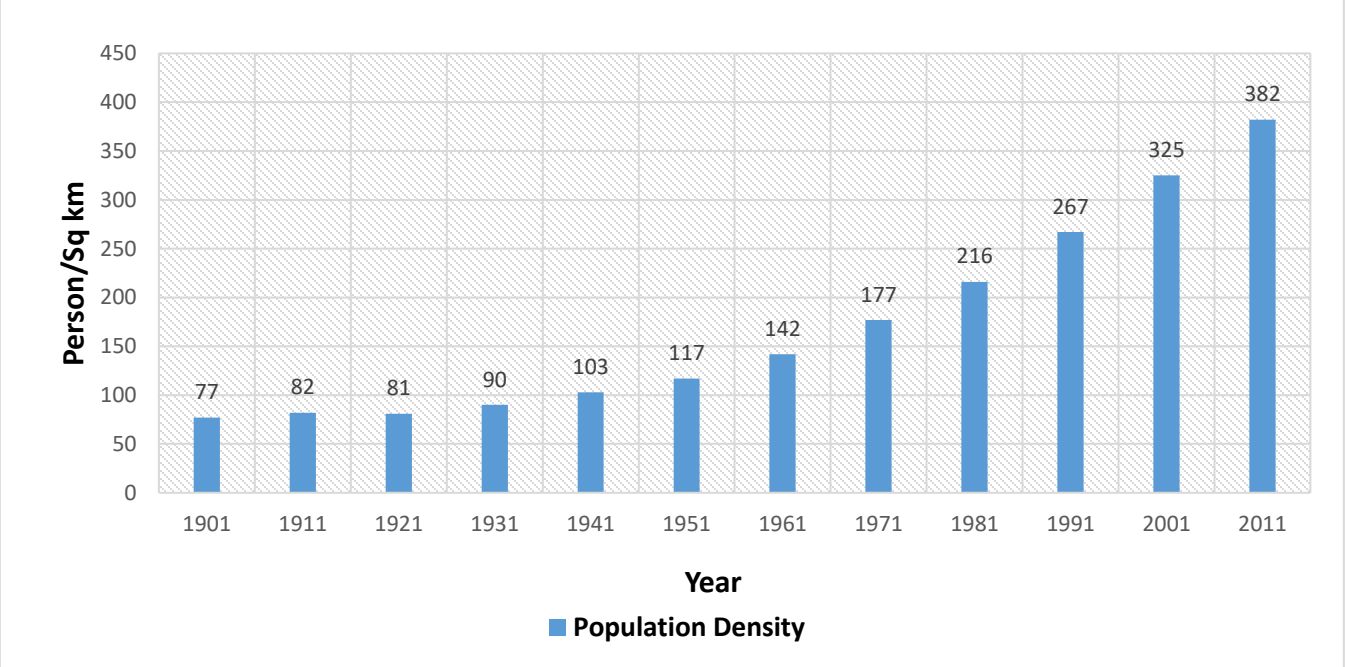

Figure.2: India Population Density [4]

In India, 27.3% of the total projected population of 2015 were below the age of 14 years and majority (64.4%) of the population were in the age group of 15-59 years this also called economically active population and 8.5% population were in the age group of 60 to 85+ years. Cleary Shown as below fig.3.

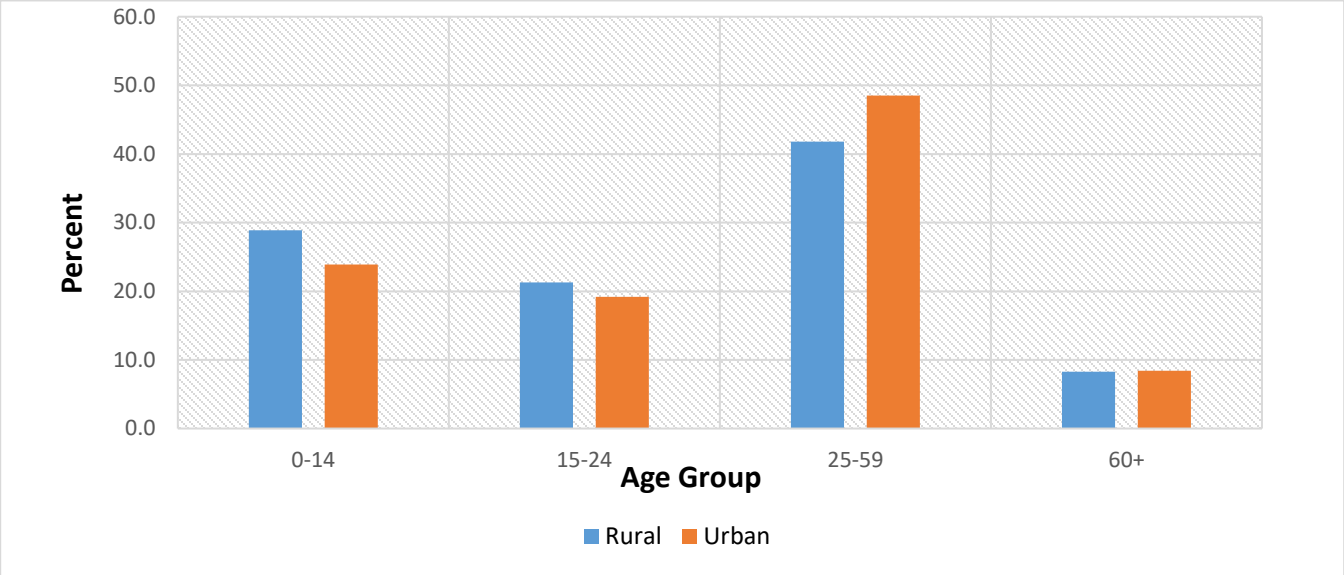

Figure 3: Distribution of Estimated Indian Population 2015 [6]

As on 2015 India has registered Birth Rate of 20.8 per 1000 populations and Death Rate of 6.5 per 1000 populations while the Natural Growth Rate was 14.3 per 1000 population in India. The Birth Rate in Rural was higher than in the Urban. Similarly, the Death rand natural growth rate were also higher in rural as compared to the urban. The population, however, continues to grow, as the decline in the birth rate is not as rapid as the decline in the death rate. The life expectancy of life at birth has increased from 49.7 years in 1970-75 to 67.9 years in 2010-14. For the same period, the life expectancy for females is 69.6 years and 66.4 years for males as shown in fig.4

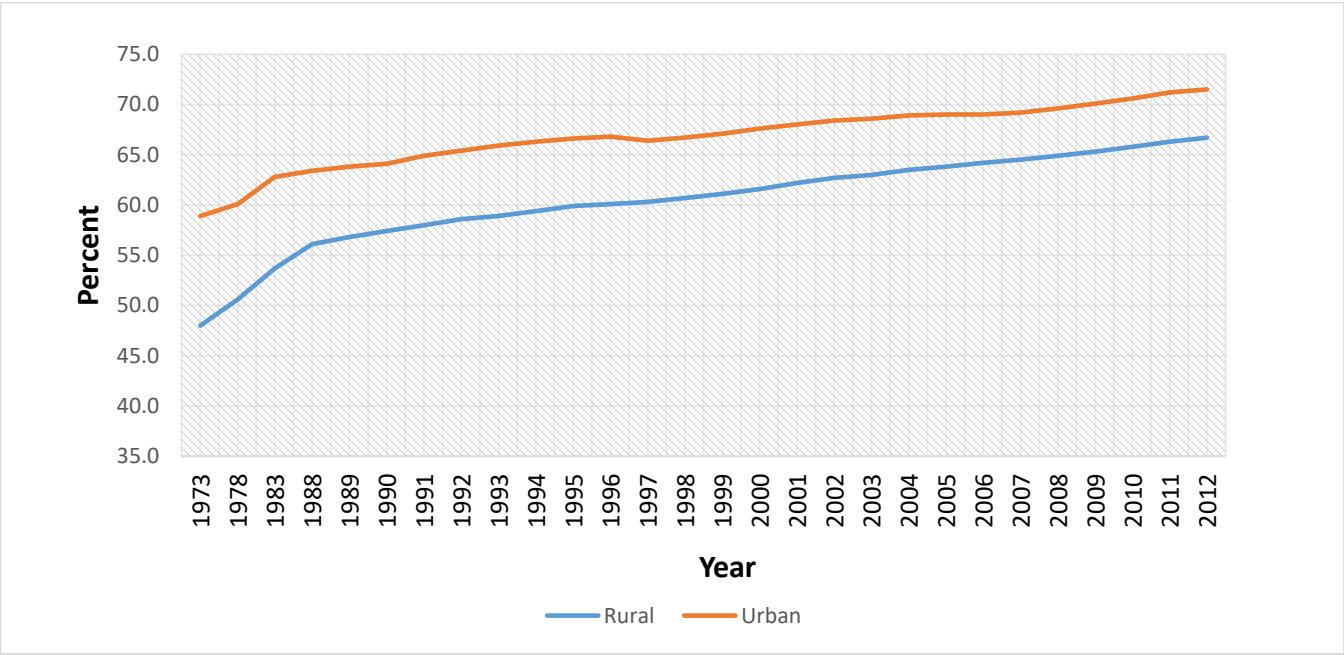

Figure 4: Expectation of life at birth in India [6]

Infant mortality rate has declined considerably (37 i.e. per 1000 live births in 2015), however differentials of rural (41) & urban (25) are still high. As per the latest data available, maternal mortality ratio is highest in Assam & lowest in Kerala. The Age-specific death rate is declining over the years; the rural-urban differentials are still high. The total fertility rate

(TFR) for the country was 2.3 whereas in rural areas it has been 2.5 and it has been 1.8 in urban areas during 2015 as per the latest available information.

4. Present Health Infrastructure in India

Health infrastructure consist many indicators, its includes details of medical colleges, students admitted to M.B.B.S. course, post graduate degree/diploma in medical and dental colleges, admissions to BDS & MDS courses, AYUSH institutes, nursing courses, paramedical courses, allopathic hospitals, hospital beds. Indian system of medicine & homeopathy hospitals, sub centers, PHC, CHC, blood banks, eye banks, mental hospitals and cancer hospitals.The Health Infrastructure indicators is subdivided into two categories viz. educational infrastructure and service infrastructure. Educational infrastructure provides details of medical colleges, students admitted to M.B.B.S. course, post graduate degree/diploma in medical and dental colleges, admissions to BDS & MDS courses, AYUSH Institutes, nursing courses and paramedical courses. Service infrastructure in health includes details of allopathic hospitals, hospital beds, and Indian system of medicine & Homeopathy hospitals, sub centers, PHC, CHC, blood banks, eye banks, mental hospitals and cancer hospitals. Medical education infrastructures in the country have shown rapid growth during the last 22 years. The country has 462 medical colleges, 309 dental colleges for BDS & 242 dental colleges for MDS. As shown in fig 5.

There has been a total admission of 56,748 in 462 medical colleges & 26,790 in BDS & 6,019 in MDS during 2016-17.As shown below fig.6

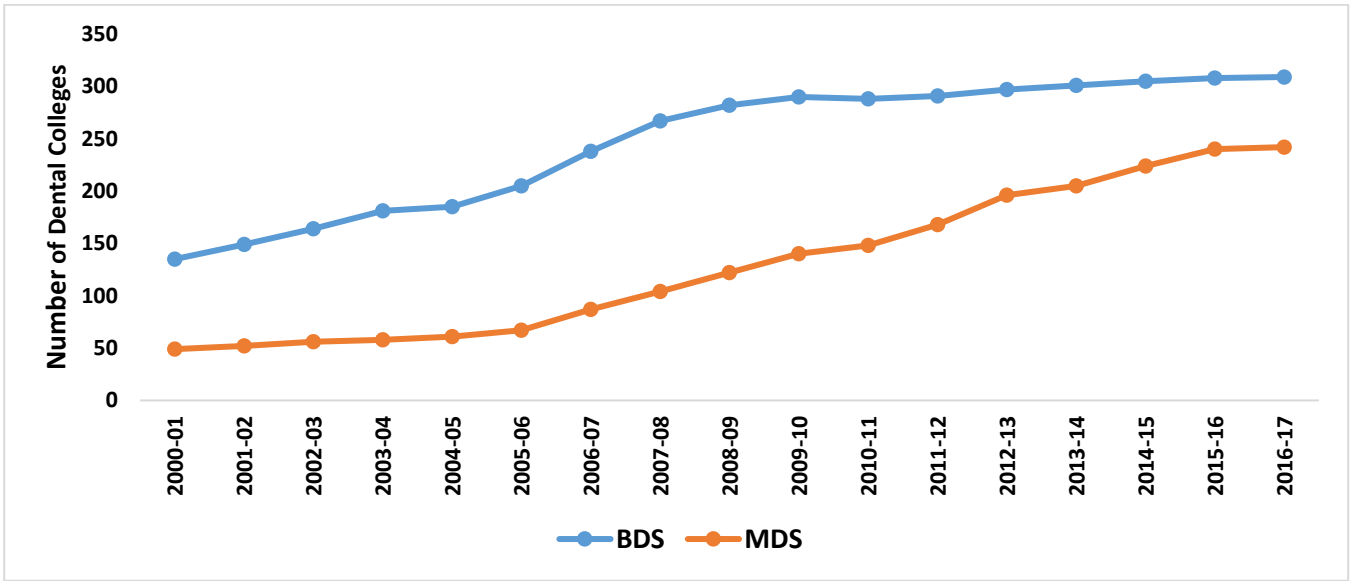

Figure 5: Number of Dental Colleges in India [4]

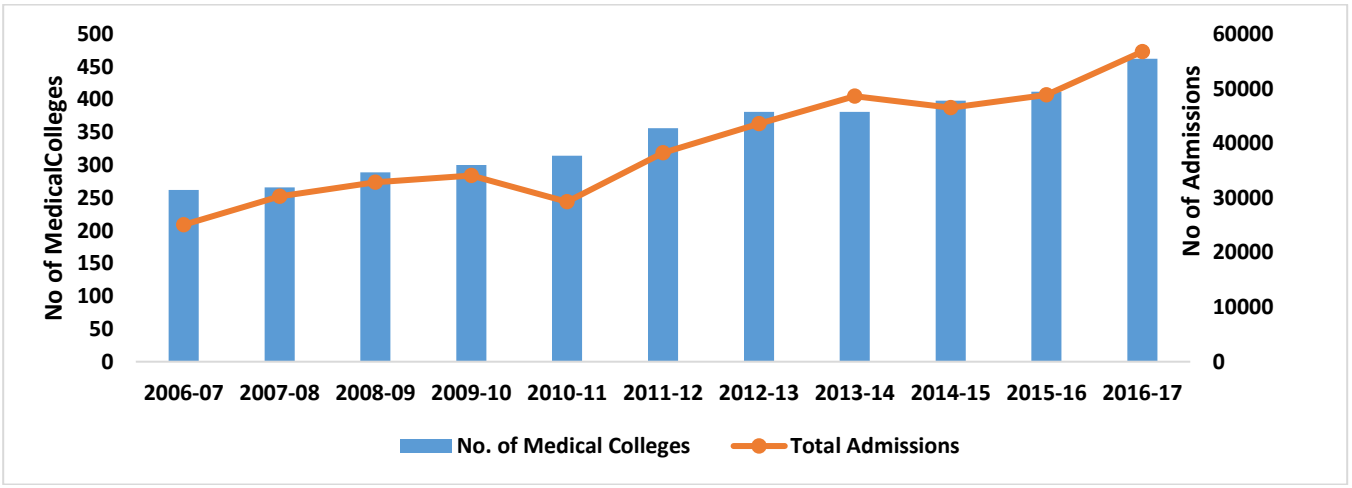

Figure 6: Number of Medical Colleges & Admissions in India [4]

India has 3,123 Institutions producing 1,25,762 General Nurse Midwives annually and 777 colleges for Pharmacy (Diploma) with an intake capacity of 46,795 as on 31st October, 2016. There are 14,379 hospitals having 6,34,879 beds in the country. 11,054 hospitals are in rural area with 2, 09,010 beds and 3,325 hospital are in Urban area with 4, 25869 beds. Medical care facilities under AYUSH by management status i.e. dispensaries & hospitals are 26, 405 & 3, 639 respectively as on 1.4.2016. Health-care is the right of every individual. 60% of population of India is rural population. A majority of 700 million people lives in rural areas and to cater their health needs, there are 1,55,069 Sub Centres, 25,354 Primary Health Centres and 5,510 Community Health Centres in India as on 31st March 2016.The Central Government Health Scheme (CGHS) was started under the Ministry of Health and Family Welfare in 1954 with the objective of providing comprehensive medical care facilities to Central Government employees, pensioners and their dependents residing in CGHS covered cities. At present, CGHS has health facilities in 30 cities having 279 Allopathic Dispensaries and 85 AYUSH Dispensaries in the Country with 10, 25274 registered cards/ families. In Indian health infrastructure, there is total no. of licensed Blood Banks in the Country as on Oct, 2016 is 2,854. As show below fig. 7

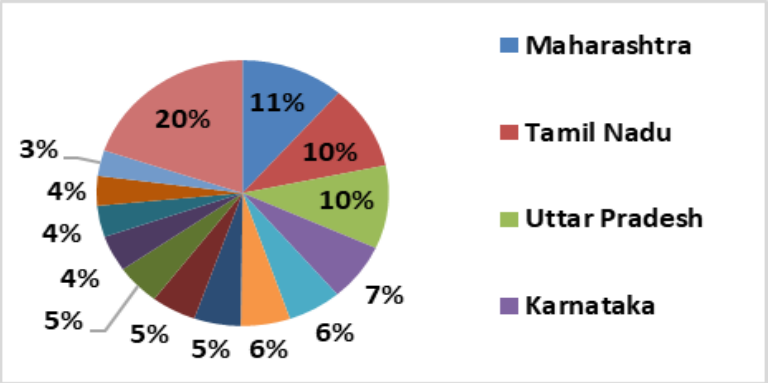

Figure 7: State wise distribution of Blood Banks in India [4]

5. Reforms in Health Sector [5]

The Govt. of India cleared the long-awaited National Health Policy 2017 this policy mainly focus to move away from 'sick health care' to 'excellent health care Centre. With a thrust on prevention and promoting health infrastructure. While this policy seeks to re-orient and strengthen public health infrastructure system in India and it also looks a fresh at strategic purchasing from the private sector and leveraging their strengths to achieve national health goals. Health infrastructure and human resource to:

(i) Ensure availability of paramedics and doctors as per Indian Public Health Standard (IPHS) norm in high priority districts by 2020.
(ii) Increase community health volunteers to population ratio as per IPHS norm, in high priority districts by 2025.
(iii) Establish primary and secondary care facility as per norms in high priority districts (population as well as time to reach norms) by 2025.

The government will pursue ambitious targets by reducing under-five mortality to 23 by 2025 and maternal mortality ratio from current levels to 100 by 2020, and Infant mortality rate to 28 by 2019. This policy is also aim to increase Life Expectancy at birth from 67.5 to 70 by 2025. It also seeks to reduce neonatal mortality to 16 and stillbirth rate to "single digit" by 2025, establish regular tracking of Disability Adjusted Life Years (DALY) Index as a measure of burden of disease and its trends by major categories by 2022.

Reduction of TFR to 2.1 at national and sub-national level by 2025, Reduce neo-natal mortality to 16 and still birth rate to "single digit" by 2025, Achieve global target of 2020 which is also termed as target of 90:90:90, for HIV/AIDSi. e,- 90% of all people living with HIV know their HIV status, - 90% of all people diagnosed with HIV infection receive sustained antiretroviral therapy and 90% of all people receiving antiretroviral therapy will have viral suppression, Achieve and maintain elimination status of Leprosy by 2018, Kala-Azar by 2017 and Lymphatic Filariasis in endemic pockets by 2017, To reduce the prevalence of blindness to 0.25/ 1000 by 2025 and disease burden by one third from current levels, To reduce premature mortality from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases by 25% by 2025.This policy is also Coverage through may health objective in Health Services.

(i) Increase utilization of public health facilities by 50% from current levels by 2025.
(ii) Antenatal care coverage to be sustained above 90% and skilled attendance at birth above 90% by 2025.

(iii) More than 90% of the newborn are fully immunized by one year of age by 2025.
(iv) Meet need of family planning above 90% at national and sub national level by 2025.
(v) 80% of known hypertensive and diabetic individuals at household level maintained &controlled disease status by 2025.

The cross sectorial goals related to health as given below:

(i) Relative reduction in prevalence of current tobacco use by 15% by 2020 and 30% by 2025.
(ii) Reduction of 40% in prevalence of stunting of under-five children by 2025.
(iii) Access to safe water and sanitation to all by 2020 (Swachh Bharat Mission)
(iv) Reduction of occupational injury by half from current levels of 334 per lakh agricultural workers by 2020. (v). National/ State level tracking of selected health behavior.

Health Systems strengthening in respect of Health finance as given below;

(i) Increasing health expenditure by Government as a percentage of GDP from the existing 1.15% to 2.5 % by 2025.
(ii) Increase State sector health spending to> 8% of their budget by 2020.
(iii) Decrease in proportion of households facing catastrophic health expenditure from the current levels by 25%, by 2025.

Health Management Information by ensuring district-level electronic database of information on health system components by 2020. (ii). Strengthening the health surveillance system and establish registries for diseases of public health importance by 2020. (iii). Establish federated integrated health information architecture, Health Information Exchanges and National Health Information Network by 2025.This policy envisages as its goal the attainment of the highest possible level of health and wellbeing for all ages people in India, through a preventive and promotes health care orientation in all developmental policies, and universal access to good quality health care services without anyone having to face financial hardship as a consequence. This would be achieved through increasing access, improving quality and lowering the cost of healthcare delivery. The policy recognizes the pivotal importance of Sustainable Development Goals (SDGs). This health policy commits itself to the highest professional standards, integrity and ethics to be maintained in the entire system of health care 2 delivery in the country, supported by a credible, transparent and responsible regulatory environment. It envisages that the resource allocation to States will be linked with State development indicators, absorptive capacity and financial indicators. The States would be incentivized for incremental State resources for public health expenditure.

The National Rural Health Mission is a wonderful program which has brought many changes in the quality of healthcare services in the rural areas. This mission can be more effective if there would be a better utilization of resources by monitoring and auditing system would further expand the horizons of the mission. There is also need of better coordination among the different sectors which are working directly or indirectly in the areas of healthcare.

6. Conclusions and Recommendation

At present the public infrastructure in India is becoming more and more accessible to the public at large, due to adequate government funding towards healthcare services. The Central Government is also increase the share of healthcare expenditure from one percentage of GDP to around three percent of GDP; the state governments should increase their share of funds allotted for improving better health infrastructure by considering of environmental aspect. Allocation of more and more budget towards the health system is an extremely necessary for development a healthy and sound infrastructure in health sector. The government must more focus on the better utilization of the funds and the resources employed by it in the healthcare services. The government must also review its health policy at regular intervals, by possibly every two years to assess the impact of different schemes and programs which are run by it. The government must identify the areas which are lagging in healthcare services, and special focus must be provided for rural areas. Special attention must also be given to the areas which are hit by epidemics, floods, and other natural disasters, because the chances of the spread of disease are greater in such areas. Suitable preventive measures must also be taken by the government in the form of vaccination and creation of better sanitation facilities to stop the occurrences of diseases. A more comprehensive, coordinated, and integrated approach would yield more fruitful results and bring radical changes in healthcare infrastructure.

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