IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e- ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 7, Issue 4 Ver. VIII (Jul.-Aug. 2018), PP 25-33
www.iosrjournals.org

Public-Private Partnership in Health Sector - Opportunities for better Health Care delivery

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Abstract : *Health is an index of development and economic growth. A lot of attention is in place to improve health conditions by providing basic amenities through better infrastructure and medical professionals. Public health facilities continue to face staff shortage as over 85 per cent specialist doctors, 75 per cent doctors, 80 per cent laboratory technicians, 53 per cent nursing and 52 per cent ANM (auxiliary nurse midwife) short across States. The density of health professionals is also, more in urban areas compared rural areas. India is ranking 52nd out of 57 countries facing human resources in health crisis. With growing population striking a balance is a herculean task making a necessity for private investments. Several health facilities have started functioning under Public-Private Partnership (PPP) model in different states. Government India's initiative of Digital India has ample opportunities for digital innovations in health care. With increased digital awareness there is a wide scope for developing Electronic Health Record (EHR) services which not only help individuals but also, Government for planning at national level. Few big hospitals have EHR service for internal convenience. Government of India has also, come up with norms and regulations for EHR services. The paper presents various options and opportunities for PPP in health. Development of HER service for effective planning at national level is possible through Public-Private Partnership. Private sector being a big source of professionals can play a crucial role in managing HER related services. Corporate Social Sustainability (CSR) is a societal obligation of corporate business groups to participate in developmental programmes. Corporate companies under CSR funds are investing in various community developmental activities. Major corporate companies are actively participating in health programmes through CSR activity. The paper highlights possible opportunities and scope for tapping CSR funds to improve health care delivery through Public-Private Partnership.*

Keywords *- PPP models, Health services, Health care-delivery, EHR, CSR*

Date of Submission: 06-08-2018 Date of acceptance: 20-08-2018

I. Introduction

Health is an important issue in terms of economic growth. Government of India is formulating many health programmes over the years. Huge investments are needed for successful implementation of health programmes due to geographically isolated rural areas from urban pockets. Rural development envisages providing urban facilities in villages like education and employment along with health. Rural development in India is a major aspect in boosting economy as 68.8% of country's population lives in villages. The population below poverty line constitutes 25.7%[1]. Providing affordable health facilities is a big challenge which involves big budgetary allocations. Recently, National Health Protection Scheme (NHPS) announced an insurance scheme of five lakh to each of 10 crore poor and vulnerable families in the country. The Govt. of India in 2018 budget has stressed the importance of healthcare and increased healthcare spending by 5% to Rs. 52,800 crore in 2018-19 from revised estimate of Rs. 50,079.6 crore in 2017-18. This is 1.15% of India's gross domestic product (GDP)[2] (Fig.1), which is among the lowest in the world. UN summit has resolved to push the Millennium Developmental Goals (MDGs) in a more elaborative way with specificity to each developmental goal with major stress to universal health[3.4]. The recently evolved CSR regime is a new source of opportunity for a big hope in terms of social investments by big corporate houses in health care delivery. The Indian healthcare market has been growing and is forecast to grow from $100 billion to $280 billion by 2020[5]. Public Private Partnership (PPP) is collaboration between the public and private sector for certain common goals is a new philosophy world-over especially in health sector. In India many such PPP scheme are functioning successfully in health in many states. Under the provisions of section 135 of the Companies Act 2013 and requirements laid down in the Companies (CSR Policy) Rules, 2014, 2% of the average profit of the company computed in the manner prescribed in the Act during the three immediately preceding financial years will be allocated for CSR activities by all corporate sectors. The present opportunity of huge funding in the form of social investment by corporate houses under the new law and policy envisaged under UNO charter of

'Millennium Development Goals' (MDGs) is a big advantage in terms of resources. Researchers have discussed health sector and analysed various CSR activities taken up by select Indian companies under different thematic areas'. One study on select corporate companies concluded that >70% investments are being made on different aspects health care[6]. Studies state that more than 40 million people are impoverished and run into massive debts to access healthcare and high out of pocket expenditure[7]. Burden of non-communicable diseases and resultant mortality is expected to increase in the coming years[8]. Therefore, health care and its delivery is a big challenge in India. The health care has been changing towards simplified management with easy-to-access real-time personal health information. Liberalized policies of government have lead to more investments in the segments of health care companies, digital health care provider services. The health care companies have many healthcare verticals including day care specialty facilities. There is a great evolution in providing health care and transparency in operating system of hospital industry. The communication highlights possible opportunities and scope for tapping CSR funds to improve health care delivery through Public-Private Partnership. Possible role of PPP in developing EHR based health services for better planning and management of health care delivery.

II. Materials and Method

The study is based on the secondary data obtained from published reports and made available on websites. An analysis of various facts and figures was taken to depict the present scenario of health services in India, opportunities and challenges in implementing digital health care. The study explores the possibility of involving corporate companies in health care delivery under CSR spending. The investigation analyses the scope for PPP model in developing centralized EHR, a concept to help government of India in planning health care programmes.

III. Results and Discussion

Health Sector Reform (HSR) is a sustained, purposeful change to improve the efficiency, equity and effectiveness of the health sector[9]. In this direction, National health profile 2017 forms the basis for Government of India's mission to prioritize and strengthen the health care system in all dimensions. The government has identified three broad components-health status & programme impact; health systems performance and health system strengthening[10].

3.1.A: Demographic indicators:

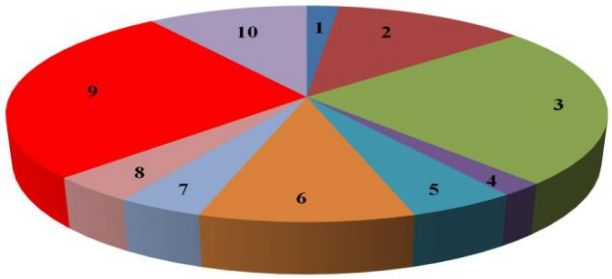
Life expectancy is a useful simple measure of a country's or state's health status. Life expectancy by sex in 2016 is 66.9 and 70.3 for male and female respectively. Kerala, HP, TN, Punjab are having more than 10% of population in the age group 60 years while it is around 6-8% in rest of the states. Growth rate is more in rural compared to urban pockets. As on 2016 Infant mortality is 41 from 80 in rural and 25 from 52 in urban and combined 37 from 74 per 1000 live births from 1994. Bihar and Uttarakhand has more than 40% and Kerala had 10% infant mortality as on 2015.

3.1.B: Socio-economic indicators in health care:

Overall literacy rate is 74% with Kerala 94% and Mizoram 91.3% well above national average. Bihar is having only 61.8% literacy rate. Per cent population below poverty line (BPL) as on 2012 is 25.7% in Rural and 13.7% in urban as per Tendulkar method.

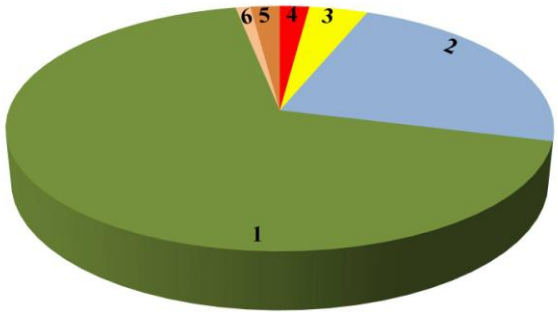
3.1.C: Health statistics of Indian population:

Though there has been substantial control still communicable diseases burden to country. Acute respiratory disease problems (68%) are high. NCD clinics recorded 8.5% diabetes, 10.9% hyper tension, 0.67 % cardio vascular and 0.18% cancer (Fig. 1 & 2).



1. Acute Respiratory disease; 2. Acute Diarrheal diseases; 3. Typhoid; 4. Malaria;5. TB; 6. Others

Fig. 1: Percent distribution of morbidity 2016



1. H1N1; 2. Acute Diarrhoeal diseases;3. Acute respiratory infection; 4. Japanese encephalitis;
5. Encephalitis; 6. Acute Encephalitis syndrome;7. Viral hepatitis; 8. Typhoid; 9. Pneumonia; 10. Others

Fig. 2: Percent Mortality 2016

SDG includes 13 targets covering all major health priorities, including four targets on the unfinished and expanded Millennium Development Goal (MDG) agenda, four targets to address non communicable diseases (NCDs), mental health, injuries and environmental issues, and four "means of implementation" targets. The target for universal health coverage (UHC) is a key to the achievement of all the other targets and the development of strong resilient health systems. Unethical means to maximise profit, less concern towards public health goals, lack of interest in sharing clinical information, creating brain drain among public sector health staff, and lack of regulatory control over Private sector health are the reason for high level of health care costs[11].

3.2: An over view of Health care system in India:

The entire gamut of health care and delivery system involves government, NGO's, doctors, academicians, pharmaceutical companies and health insurers with defined roles. In India private health sector has grown markedly. Studies state that more than 40 million people are impoverished and run into massive debts to access healthcare. Burden of non-communicable diseases and resultant mortality is expected to increase in the coming years. Therefore, health care and its delivery is a big challenge in India. According to Planning Commission (2011)[12], accessibility, availability and affordability are the three greatest challenges being faced by India's healthcare system. In India the public spending on health is around 1.2 per cent of its GDP which is among the lowest in the world. Hence, there is a need to increase public spending on health with a minimum of 3 per cent of GDP by 2020, and 4 per cent by 2025. In India rural health care is a three tier system covering different population (Table 1& 2). Government of India is constantly making efforts to strengthen the structure and modernize the system keeping WHO frame work on health system[13,14] . The WHO frame work comprises leadership governance, service delivery, information, financing, health professionals, medical products and technologies. As on 31st March, 2017, there are 156231 Sub Centres, 25650 Primary Health Centres (PHCs) and 5624 Community Health Centres (CHCs) functioning in the country. Number of Sub Centres increased by 6.5%, PHCs by 9.4% and CHCs by 40.5% in 2017 as compared to that existed in 2005 (Fig.3).

Table 1: Average rural population covered by health facility as on 2016*

Parameter	Sub Centre (SC)	Primary Health Centre (PHC)	Community Health Centre (CHC)
1. Average population covered by health facility	5377	32884	151316
Average rural area (Sq.Km) covered	20.00	122.33	562.89
Average radial distance (Km) covered	2.52	6.24	13.38
2. Average number of villages covered	4	25	116
* Based on the rural population of 2011 Census			

Table 2: Primary health care system in India

Community Health Centre (CHC)	A 30 bedded Hospital referral unit for 4 PHCs with Specialist services.
Primary Health Centre (PHC)	A referral unit for 6 Sub-Centres with 4-6 bedded manned with Medical Officer-in-Charge and 14 subordinate paramedical staff
Sub-Centre	Most peripheral point between primary Health centre & Community Health Centre manned with one HW(F)/ANM & one HW(M)

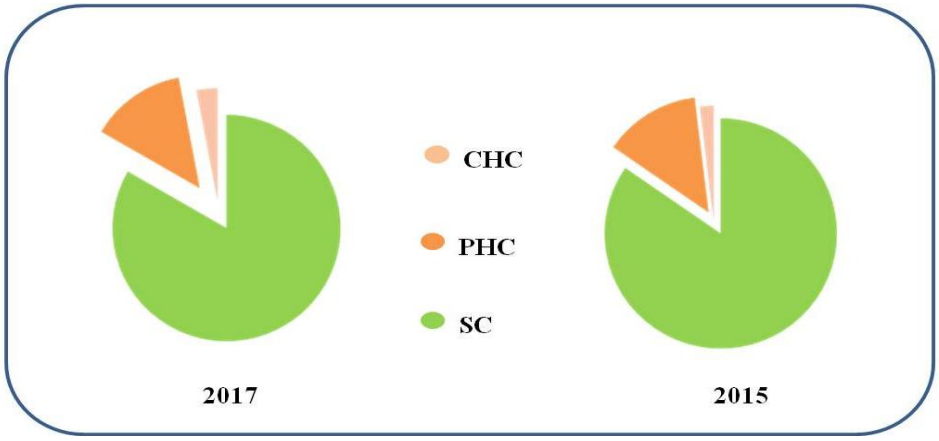


Fig. 3: Health care centers in rural India

The Specialist doctors at CHCs have increased from 3550 in 2005 to 4156 in 2017. However, as compared to requirement for existing infrastructure, there was a shortfall of 86.5% of Surgeons, 74.1% of Obstetricians & Gynecologists, 84.6% of Physicians and 81% of Pediatricians. Overall, there was a shortfall of 81.6% specialists at the CHCs as compared to the requirement for existing CHCs. Public health facilities continue to face staff shortage as over 85 per cent specialist doctors, 75 per cent doctors, 80 per cent laboratory technicians, 53 per cent nursing and 52 per cent ANM (auxiliary nurse midwife) posts are vacant across States. The density of health professionals is also, more in urban areas compared rural areas. According to WHO India's ranking is 52nd out of 57 countries facing crisis in human resources in health.

3.3.A: PPP in health care delivery:

Public Private Partnership (PPP) is collaboration between the public and private sector that enables fulfilment of certain common goals. Partnerships between the government-private institutions, the government-civil society organizations as well as between civil society and for-profit (private) health institutions are growing. PPP in health services may be profit oriented or non-profit oriented. The PPP system has three main objectives viz., infrastructure development, service providing and managing the operations. PPP models are Management Contract, Leasing, Joint Venture, BOO/BOT and Concession. Policy making is an essential input in maximizing benefits from health care service. Description of public-private partnership model is typically characterized in a 2 x 2 matrix (Fig 4).

Financing Services	**Provision of Services**	
	Public	**Private**
Public	Public health facilities surveillance programs health education	Contracts Social Insurance programs Social Marketing
Private	User fees autonomous hospitals drug donations vaccine development	Fee for service Regulation Participation in national control programs (eg.HIV)

Fig. 4: Public-private partnership model

In this model, the predominant forms of partnership are found in the two different lined boxes. These describe the models of partnership in which the private sector provides financing while the public provides services, and the opposite in which the public sector finances and the private sector provides services[15,16]. In the private provision – public financing model, the services, or at least some part are delivered by the private sector in the belief that the quality and efficiency of these services will be better than if they were provided by the government directly. Public-private partnerships help in combining the strengths of private actors, such as innovation, technical knowledge and skills, managerial efficiency and entrepreneurial spirit, and the role of public actors, like social responsibility, social justice, public accountability and local knowledge, to create an enabling environment for delivering high quality health infrastructure and services .The common PPP model in the health sector is 'Contracting'. The contracting may be contracting in, contracting out, service contract, operations and management contract and capital projects with operations and maintenance contract.

3.3.B: Key precursors for PPP models in health sector:

- Increased costs and budgetary constraints
- Political aspirations and will to improve public health services
- Demand for facilities and access to higher health care services
- Opportunity to leverage private investment for the benefit of public services
- Chances for partnership with non-profit partners (NGO's) working at gross root level
- Highly developed and improved private health care service available for partnership with governments for more penetration.

3.3.C: Challenges in PPP model health care service:

Resources to monitor the quality of health services provided with dynamic policy making in implementation process are essential to assess the PPP model for betterment. The important challenges in PPP in health care are:

1. Financing mechanism
2. Management to sustain the programme
3. Strategic planning
4. Monitoring & Evaluation
5. Educating civil society

The PPPs model must aim at bringing quality and affordable healthcare, which help to reach and expand the services offered by public healthcare in-situations across the country (Fig.5). All actors involved in the Public Private Partner-ships work towards meeting the health needs of the country. The important input factors in health care system under a PPP model are availability of medical professionals, paramedical staff and high costing diagnostic machinery. While, cases attended and health care provided are seen as quantifiable output factors. Technical efficiency, allocative efficiency and productive efficiency are three main measures to assess efficiency of healthcare units[17]. Ultimately, the improved health status and quality of life seen as final output in a successful health care delivery system[18]. According to the Organisation for Economic Co-operation and Development (OECD) Report (2004)[19], adequate and effective delivery of public services is also central to achieving the Millennium Development Goals (MDGs). Some of the successful ventures existing in Public–Private Partnerships (PPP) models in health Sector are useful resource (Table 3).

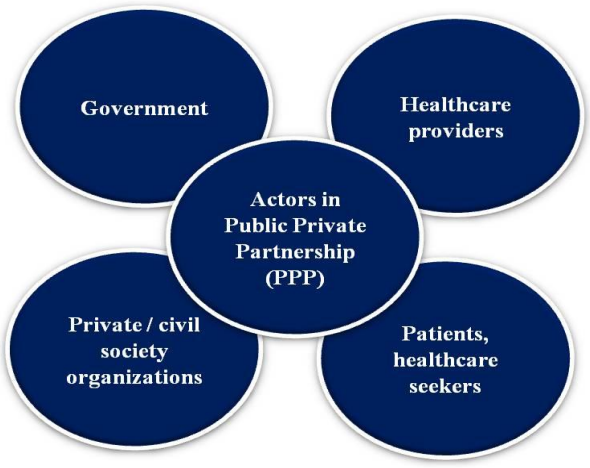


Fig 5: Actors in PPP system

3.4: CSR and Health services:

Out-of-pocket expense at the point of service use in India is about 85 percent putting burden on the poor leading to indebtedness[20]. Out-of-pocket medical costs alone may push 2.2% of the population below poverty line in one year[21]. The government alone cannot meet the demand of increased health care cost. Participation of private sector under the umbrella of the PPP schemes for infrastructure, capacity development and delivery opened up new chapter in health care delivery system. Major thematic areas under health being addressed by corporate companies under CSR programmes were investigated by researchers. In line with extant provisions of section 135 of the Companies Act 2013 and requirements laid down in the Companies (CSR Policy) Rules, 2014, 2% of the average profit of the company computed in the manner prescribed in the Act

during the three immediately preceding financial years will be allocated for CSR activities by all corporate sectors. The present opportunity of huge funding in the form of social investment by corporate houses under the new law a change can be made if proper investment policy envisaged under UNO charter of '*Millennium Development Goals*' (MDGs) is adhered to. In the context of new developments in health care delivery, there is an immense scope for private sector to support government's initiative of digital health care. There are several innovative ways where a Private sector can involve in three possible options which not only will increase the arm of healthcare in India but also increases the efficiency through the use of advanced technology (Fig.6).

Role of private sector involvement in health care delivery system needs to be exploited the fullest possible way. Some of the successful ventures existing in Public–Private Partnerships (PPP) in health Sector[22] can be useful for making replica of ventures are viz.,

1. Addressing issues related to Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR) and Malnutrition reduction, Health camps etc.
2. Health care facilities to people living in the villages and elsewhere through Hospitals.
3. Mother and Child care projects, Immunization programmes with a thrust on polio eradication, Adolescent health, Health care for visually impaired, and differently-abled, Preventive health care through awareness programmes and non- communicable diseases.
4. Community sensitization & mobilization through Puppet show, door to door campaign, community meeting, enrolment drives, *Nukkad Natak* etc.
5. Mobile Medical unit with basic medical facilities.

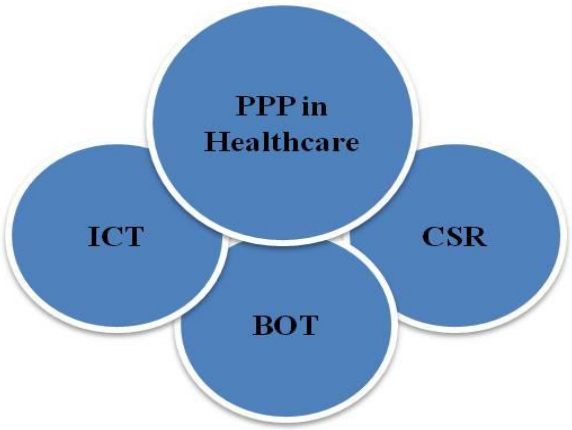


Fig. 6: Triple Bottom line for PPP in Health care

Table 3: Public–Private Partnerships in health Sector

S.N	Type of service and partnership
1	Tertiary Care: Rajiv Gandhi Super-speciality Hospital, Raichur, Karnataka.
2	Rural Health Care Delivery and management of PHCs, Arunachal Pradesh.
3	Health Insurance: Community Health Insurance Scheme, Karnataka with cost shared between government and private players, Karnataka.
4	Outreach/Health Delivery: Mobile Health Service, Sunderban, W. Bengal.
5	RCH Services: Merry Gold Health Network and SAMBHAV Voucher Scheme, U.P.
6	Emergency ambulance Service, by Seva Nilyam an NGO operated Government Ambulances, T.N.
7	Aarogyaraksha National Health by Insurance Company. Health Insurance Scheme with cost shared between Government and Private Players, A.P.
8	Rajiv Aarogyasri by different vendors with vendor services to sponsored patients, A.P.
9	Seven Hills Hospital with government providing land free of cost, Maharashtra.
10	Chiranjeevi Yojana a Network of Practitioners, reimbursed by Government, Gujarat.
11	Multi Specialty Hospital, Bhatinda, Mohali Max Health Care with revenue Share, Punjab.
12	Indraprastha Hospitals, Apollo Hospital with government providing land free of cost, Delhi.

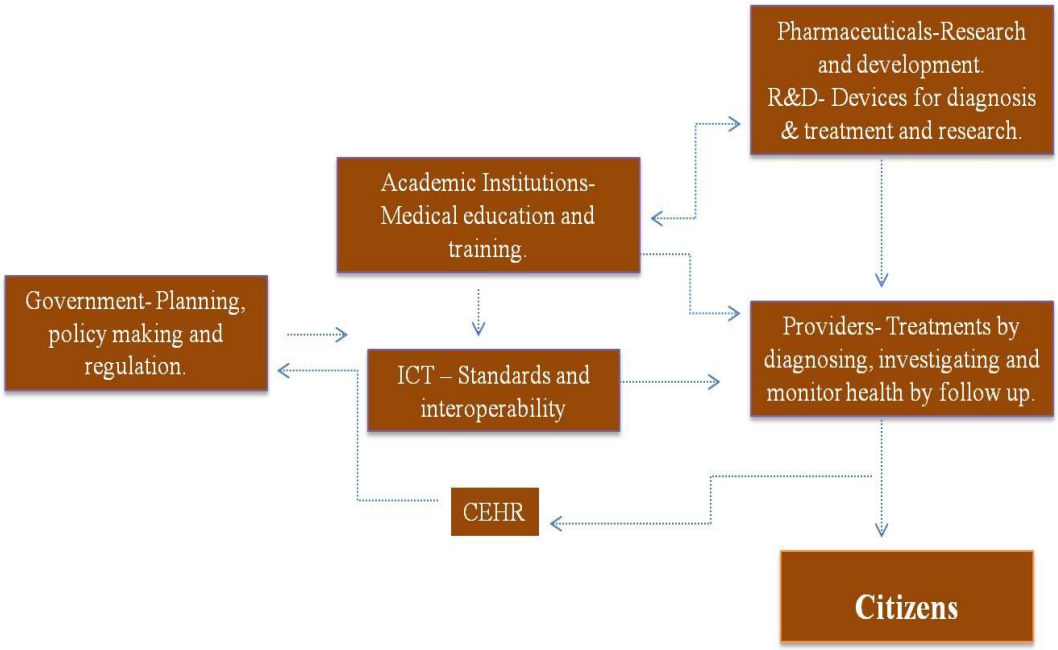


Fig. 7: Stakeholders in Centralized EHR

3.5: Opportunities and challenges:

With increased computer dexterity there are many options opened up in health care science. Globally, many sites are offering on-line services in health care and a host of other services. In India many start-ups have started offering digital solutions to health related services. Digital healthcare solutions that are poplar in India are - 1) M-health; 2) Remote diagnosis; 3) Telemedicine and 5) Wearables. The start-ups have changed the perception of heath care in India offering different service like a) medical profession practice management and marketing; b) tools to help patients in tracing healthcare facilities such as pharmacies, hospitals and blood banks across India; c) offering online consultations. Some devices for health workers with pictorial and vernacular instructions are also, available.

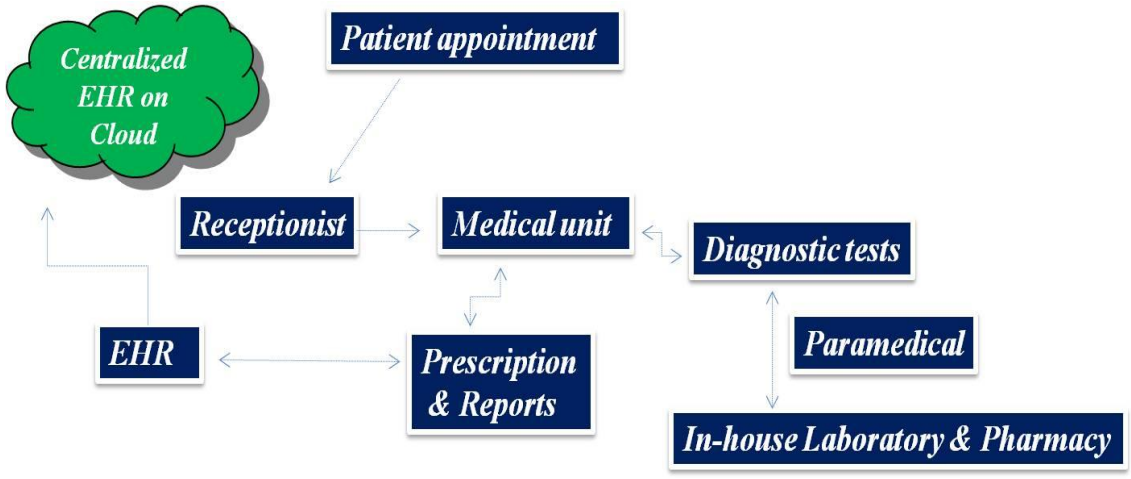


Fig. 8: Schematic Centralized EHR on cloud through group network

Opportunities are available on-line for reposition of health records for users to store. Some of the hospitals have in-house depository of patients' health records. PHR is an electronic resource of personal health information to retrieve and make health decisions at any point of time known as EHR. There are many EMR providers and hospitals in India which have implemented the EHR at the hospital leve[23]. These EHR at the hospital level need to be interconnected through cloud as the geographical location of patient will not remain same. The CEHR will enable to track the records even with the mobility of patient (Fig. 7 & 8). Digital India launched in 2015 by the Government of India is to make the people of country digitally empowered with an emphasis on e-governance. India stands around Universal healthcare and e-healthcare programmes for reducing health costs and to give wider access to health insurance. A regulatory framework and guidelines dealing with

electronic health record standards[24] in 2016 is an attempt to establish uniform standards for health records across the industry that would also provide interoperability. Ministry of Health and Family Welfare laid down Electronic Health Record (EHR) Standards. Besides the lack of overall healthcare infrastructure, the second most important influence on India's healthcare industry is its lack of a medically insured population and high out-of-pocket expenditure (71.13%)[25]. India currently has the second largest CAGR in healthcare (11%) among all BRIC countries[26]. Healthcare is one of the fastest growing industries and is expected to expand at a CAGR of 18.3% during 2012–20 to reach 280 billion USD[27]. Centre for Development of Advanced Computing (C-DAC), Pune, is designated to run the National Release Centre, for distribution and management of SNOMED CT a popular coding standard in the Health IT industry within India[28]. SNOMED CT is the universal health care terminology (ET). Cloud computing is a technology where applications and services are provided to pool resources via Internet with greater flexibility and at low cost. Models connecting individual EHRs to centralized network via Cloud enable government to plan health services at national level[29]. PPPs can be formed in development of technologies to digitalize health care delivery and help government in addressing health care needs of vulnerable groups. The process also, aids the government in suitable planning at national level.

IV. Conclusions

Public and private partnership has emerged as a new source resource to address constraints in government programmes. There is growing realisation that, given the opportunity private sector can contribute immensely with its expertise. Involvement of the private sector in operational aspects can reduce the bureaucracy aspects. Health status, risk factors, service coverage and health systems of WHO are the key indicators for government to look in seriously while, making PPP models. The model should accommodate principle of equal risks and rewards. A frame work for developing PPPs should address the health care needs of local communities. NGOs can play a useful role because of their size, flexibility and vicinity to local communities. A regulatory framework and guidelines dealing with electronic health record standards in 2016 by government of India is rightly timed to establish uniform standards for health records across the industry with interoperability. Government should try to tap the expertise of IT professionals in private sector in developing effective ICTs while implementing digital health care. An electronic record of health statistics can help government in planning health care programmes more realistically. Towards this direction, PPP in developing EHR network on a centralized basis (CEHR) can be a novel approach. The recent legalized CSR spending is a new avenue to involve corporate companies in health programmes. CSR funds can be effectively channelled in digitalization of health care system.

References

[1]. Rangandhan S. Health services in rural India – Role of CSR in better Delivery. IJAR. 2015.Vol. 5(9): 206-208.
[2]. Budget 2018: Insufficient allocation for the Health sector- Business Today. 19th Feb. 2018.
[3]. https://www.businesstoday.in
[4]. The future we want. Resolution adopted by the General Assembly on 27 July 2012. A/RES/66/288. United Nations General Assembly, Sixty-sixth session, agenda item 19 http://www.un.org/ga/search/view_doc.
[5]. Mainstreaming the 2030 agenda for sustainable development. Reference guide to UN Country Teams. February 2016. New York (NY): United Nations Development Group;2015 (https://undg.org/wp-content/uploads/2015/10/UNDG-Mainstreaming-the-2030-Agenda-Reference-Guide-Final-1-February-2016.pdf..
[6]. India Brand Equity Foundation, Healthcare Industry in India, Sectoral Report: September 2017, https://www.ibef.org/industry/healthcare- india.aspx
[7]. Ranganadhan,S. Corporate Social Responsibility In India – A Review Of Theme Areas And Their Implementation. Int. J Innovative Research and Advanced Studies, 2017.Volume 4(11): 437-440
[8]. Kulkarni, S. India Sector Paper: Health Overview and Prospects. New Delhi:Centre for Media Studies.2013 (submitted to Asian Development Bank).
[9]. Sushma Dey. Non-communicable diseases case 61% of deaths in India: WHO report. Times of India, Sept. 20, 2017.
[10]. Berman, P. Health Sector Reform: Making Health Development Sustainable. In Health Sector Reform in Developing Countries: Making Health Development Sustainable edited by Peter Berman. 1995.Boston: Harvard University Press
[11]. National Health profile. Central Brea of Health intelligence, 2017. http://www.cbhidghsNHP_2017.1pdf
[12]. Bennett S, G Dakpallah, P Garner, L Gilson, S Nittayaramhong, B Zurita and Anthony Zwi. Carrot and Stick: State Mechanisms to Influence Private Provider Behavior. Health Policy and Planning 1994. Vol.9(1):1-13
[13]. Planning Commission of India. High level expert group report on universal health coverage for India.2011.
[14]. Ministry of Health and family welfare, GoI. 2016. http://www.mohfw.nic.in.
[15]. Rao, K, A. Bhatnagar, and P. Berman. India's health workforce: size, composition and distribution," 20119. In: World Bank/Public Health Foundation of India, J. La Forgia and K. Rao, Eds., India Health Beat, New Delhi, India.
[16]. Mitchell, Marc. Models of Service Delivery (Asian Development Bank Institute Working Paper Series), Harvard School of Public Health. 2000.Vol 1, no. 1.
[17]. World Health Organization. Report on Interregional Meeting on the Public/Private Mix in National Health Systems and the Role of Ministries of Health. 1991.Geneva. http://www.whoindia.orgWorld Health Organization- Everybody's business: strengthening health systems to improve health outcomes: 2007.WHO's framework for action.
[18]. Worthington, AC..Frontier Efficiency Measurement in Healthcare: A Review of Empirical Techniques and Selected Applications. Medical Care Research and Review. 2004. 61(2), pp. 1-36.
[19]. Kooreman, P. Nursing home care in the Netherlands: a nonparametric effi-ciency analysis. Journal of Health Economics 1984.13:93, pp. 301-316.

[20]. Organisation for Economic Co-operation and Development. A Global Plan to Achieve the MDGs, Draft report for discussion at the OECD-DAC High-level Consultation on the UN Millennium Project, 8-9 July, 2004. www.norad.no/default.asp?FILE=items/3036/108/Fiscal%20Sustainability%20Feb.doc.
[21]. Kulkarni, S. 2003. India Sector Paper: Health Overview and Prospects. New Delhi:Centre for Media Studies (submitted to Asian Development Bank).
[22]. Selvaraju, V and VB Annigeri. 2001. Trends in Public Spending on Health in India. New Delhi: National Institute of Public Finance and Policy. Background paper for the Commission on Macro Economics and Health (India).
[23]. Khushbu B. Thadani. Public Private Partnership in the Health Sector: Boon or Bane. Procedia - Social and Behavioural Sciences. 2014. 157: 307 – 316
[24]. Anurag Dubey, Implementing EMR- Are Indian Hospitals ready? eHealth magazine March 2008. http://www.ehealth.eletsonline.com
[25]. Ministry of Health and Family Welfare Circular Electronic Health Record (EHR) Standards (30 December 2016), https://www.nhp.gov.in/NHPfiles/EHR-Standards-2016-MoHFW.pdf
[26]. 2005 report from World Health Organization Article: "National Health Accounts in India"
[27]. World Bank data: http://databank.worldbank.org/data/home.aspx
[28]. IBEF. (2015). Healthcare industry in India. Retrieved from http://www.ibef.org/industry/healthcare-india.aspx
[29]. Unique code to define patient's medical history in pipeline. Economic Times, November 04, 2015, http://www.economictimes.indiatimes.com
[30]. Ranganadhan.S (2018). Centralized Electronic Health Record (CEHR) - A Novel concept for better planning and management of health care delivery in India **Int. J. Medical Science**. Vol.5 (4):1-8.

S. Ranganadhan "Public-Private Partnership in Health Sector - Opportunities for better Health Care delivery"." IOSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 7, no.4 , 2018, pp. 25-33.