A Critical Overview of the Health System in India

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Introduction

Millions in India have benefitted from remarkable progress in public health in the past few decades. India has achieved many milestones such as controlling HIV proliferation, eradicating Polio virus, significantly bringing down population indicators such as infant mortality rate (IMR), maternal mortality rate (MMR), and hunger levels. Life expectancy at birth has increased to 68.3 years in 2015, up from 58 years in 1992-93 and IMR has decreased from 78.5 to 41 per 1000 live births from 1992-93 to 2014-15. The MMR has decreased to 130 per 100,000 live births from 437 in the same period. World Health Organisation has declared India free from polio and maternal and neonatal tetanus in 2014 and 2015 respectively (Patel, et al. 2015) (Yasmeen 2019) (Indian Institute for Population Sciences 1993).

This progress, although encouraging, is far from desirable. On IMR, India, with a figure of 33 per 100 live births in 2017, fares below global average (29) and also its neighbours including Myanmar (30), Nepal (28), Bangladesh (27), Bhutan (26), Sri Lanka (8) and China (8). The incidents of infants killed in hospitals in past year alone, whether in Uttar Pradesh, Rajasthan, Gujarat or elsewhere in India, are a grim reminder of the state of health system in India, especially in the public sector (The Wire 2020). Latest report form NITI Aayog points to deep seated inequality in health status between states, with Overall Performance Index (OPI) scores varying from 33.69 in Uttar Pradesh to 80 for Kerala in 2015-16 (NITI Aayog 2018). Globally, Indian health system is among the worst performers. According to Global Healthcare Access and Quality Index published in 2017, India was ranked at 154 among 195 countries studied for 1990-2015 period. The Healthcare Access and Quality Index is based on death rates for 32 diseases that can be avoided or effectively treated with proper medical care, also tracked progress in each nation compared to the benchmark year of 1990 (GBD 2015 Healthcare Access and Quality Collaborators 2017).

In last few decades, non communicable diseases (NCDs) such as cardiovascular diseases, diabetes, chronic obstructive pulmonary disease, cancer, etc. and injuries have shown increased proportion in terms of disease burden and causes of mortality. While disease

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burden due to communicable disease, such as infectious and parasitic diseases, decreased marginally, that from NCDs has significantly increased (Yadav and Arokiasamy 2014). As early as 2004, deaths due to NCDs was twice that of communicable diseases. NCDs caused 50.1% of the deaths in the country that year. In the same year, Indians spent USD 9.1 billion or 3.3% of India's GDP to manage their NCDs (Taylor 2010). Latest studies point to characteristics peculiar to India. While NCDs typically affect population above the age of 55 years in developed countries, their onset can be seen in India a decade earlier (>45 years) and effects younger population too (Arokiasamy 2018).

The National Health Policy of 2017, has fallen short of expectations in even defining an ambitious desirable outcome, with mediocre targets to be achieved in extended periods of time. For example, the commitment to increase public spending on health to 2.5% of GDP has been put off to 2025, as is the commitment to the target to increase life expectancy at birth to 70 years. For comparison, our apparently poorer neighbours, including Nepal, Sri Lanka, Maldives, and Bangladesh have already achieved this target. Similar story for other key indicators such as U5MR, neonatal MR, etc. As per the document, the NHP "advocates a progressively incremental assurance based approach, with assured funding to create an enabling environment for realising healthcare as a right in the future" (Sengupta 2017).

To begin looking for solutions required to improve performance of Indian health system, a deep understanding of the complex structural issues is required. A comprehensive assessment of the health system, although warranted, is beyond the scope of this article. The aim of this article is to simply highlight a few issues within the complex health system in India, with more focus on the public sector. A health system including both preventive and curative services, largely comprises of Surveillance and Awareness; Research; Access; and Law & Policy. Here surveillance and awareness are more concerned with preventive part, Access mainly with curative part, and Research and Law & Policy with both. Each of these components are described and some key issues of national concern pertinent to Indian context in each are highlighted in following sections.

Health Policy, Law and Regulation

National Health Policy

The National Health Policy (NHP), 2017 was needed for four reasons. First, since 2002 when last national policy was adopted, India has undergone significant transition in terms of disease burden and health levels. Second, healthcare industry has shown tremendous growth after 2002 policy was put in place, recording a double digit growth every year. Third, the increasing cost of healthcare and extraordinarily high out-of-pocket expenditure on health pushing millions into poverty every year. And fourth, due to robust economic growth, the fiscal situation of the government is expected to have improved to revise targets and strategies to achieve the targets (IBEF 2019) (Arokiasamy 2018) (Ministry of Health and Family Welfare 2017) (S. Rao 2017).

The NHP 2017 clearly outlines position of the government on three significant areas. First, the goal as to ensure universal access to comprehensive healthcare through "public health sector with focus on quality" in the long run. Second, greater role for private sector "to fill the gap" in provision of a detailed set of services in short term. These include "training, skill development, community training for mental health, disaster management, purchase of services to fill gaps and preferentially for Central Government Health Scheme members, and primary healthcare in urban areas. There will also be collaboration with the private sector for infectious disease control, immunisation services,

disease surveillance and health information and manufacture of medical devices. The policy also seeks to take steps to improve, upgrade and incentivise the quality of services being provided by the private sector in rural and remote areas and among underserved populations and provisioning of diagnostic laboratory support" (Ministry of Health and Family Welfare 2017) (S. Rao 2017).

Third, the acceptance of a differential financing model – per capita basis for primary care; performance based reimbursements for operational costs of the facilities; and fiscal allocations based on "financial ability, developmental needs and high priority districts." And fourth, institutional reforms required and proposed institutions in a number of areas. The NHP proposes to establish "National Institute for Chronic Diseases, National Health Standards Organization, National Allied Professional Council, medical tribunals, National Digital Authority, a system for health technology assessment and at the Centre and in states a multi-stakeholder institutional mechanisms in the form of autonomous societies or government-owned trusts to purchase services from the providers – government, not-for-profit and for profit, in that order – and a Common Sector Innovation Council as a platform for a more effective collaboration with the departments engaged in medical research and discovery." (Ministry of Health and Family Welfare 2017) (S. Rao 2017)

There are number of concerns with the NHP 2017. First, the ambitious goals of universal health coverage are not matched with commensurate funding. The policy largely reiterated the spending targets set by the High Level Expert Group on Health in 2012 for 12th five-year plan, and as stated earlier, sets a target of 2.5% of GDP for 2025. This is grossly inadequate. For example, in primary care, where the NHP envisages public sector provision as per Indian Public Health Standards, estimates of MoHFW show investment requirement of INR 1.4 lakh cores. This does not seem feasible with the current or the envisaged rate of public spending on healthcare (Ministry of Health and Family Welfare 2017) (Ministry of Health and Family Welfare 2017).

Secondly, the NHP puts little effort to address the limited agency capability of the public sector and institutions which led some of the earlier targets form 1983 and 2002 policies not being met. The NHP aims to "strategically" utilise capacity in private sector to address the "gaps in public sector" in the "short term". There is no clarity on how public sector will be strengthened. In addition, the private sector already caters to 80% of the out patient demand and more than 60% of the inpatient care. In such a scenario, gap filling by private sector is a misnomer and lack of clarity on the short term and incentivising the dominant private sector raises a red flag about the capacity of public sector in the future. Third, while the NHP strongly pushes for a larger role for private sector, it is rather weak on its commitment to regulations for the health system. Be it establishment of an autonomous drug regulator; strengthening of Clinical Establishments Act; inspection, monitoring and maintenance of public facilities; the NHP is silent on key areas of regulation (Ministry of Health and Family Welfare 2017) (Ministry of Health and Family Welfare 2017) (S. Rao 2017) (Mohan 2017).

Drug Pricing

As to drug pricing policy in India, the National Pharmaceutical Pricing Authority (NPPA)is authorised to make the pharmaceutical pricing policy and also implement Drug (Prices Control) Order under Essential Commodities Act to regulate price and availability of all drugs listed in National List of Essential Medicines (NLEM) (Department of Pharmaceuticals 2015). First, the NPPA falls under Ministry of Chemicals and Fertilisers, while it's function

is largely related to health. Ministry of Health and Family Welfare, which already prepares the NLEM, may be better suited for carrying out these functions more effectively. In Jan 2019, a standing committee on affordable medicines and health products (SCAMHP) in NITI Aayog has been created to recommend drugs and prices to NPPA (Thacker 2019). Acting on SCAMHP recommendation, in December 2019, NPPA increased prices of 21 formulations by 50% invoking special powers under DPCO 2013 (Bussiness Standard 2019).

Since, NLEM is a limited list, to make drugs (which constitute largest share of the OOP expenses) more affordable, efforts are required in addition to capping prices. There are a few models in Indian states, such as Tamil Nadu worth looking at to provide drugs at lower prices by bulk buying, reducing inefficiencies in distribution, etc. Such state level policies may be a benchmark and replicated in other states.

Regulation

One of the most sensitive issues in health governance has been the regulation of healthcare sector. A number of practitioners have pointed out widespread corruption and malpractice in medical profession (Jain, Nundy and Abbassi 2014) (Sachan 2013). Peters and Muraleedharan (2008) have argued that in Indian healthcare sector, bureaucratic approach has largely failed to ensure protection of vulnerable groups; ensure ways of health financing meets the public interest; and generate trust between providers and public (Peters and Muraleedharan 2008). The Clinical Establishments Act (CEA) was enacted by the Union govt. in 2010, and it has been adopted in 11 states. However, the problem of bureaucratic approach in India of low enforcement is bound to impact implementation of CEA.

India also adopted a consumer based approach, wherein, aggrieved patients approach Consumer Forums set up under Consumer Protection Act 1983. There are studies that point to limited number medical cases in Consumer Forums, high transaction costs, and majority cases being ruled in favour of the defendants (Peters and Muraleedharan 2008) (Misra 2003). As for self or the market regulation, the professional associations such as the Indian Medical Association have always opposed regulatory attempts in the health sector.

At the same time large hospitals have vouched for accreditation through NABH or other international accreditation agencies. This approach to regulation may not be suited for all kinds of healthcare providers, especially small hospitals, clinics, etc. One approach that has not been fostered, however, is an institutional collaboration between non-government healthcare providers, civil society organisations to ensure quality services at affordable price. There are a few examples such as Janani in Bihar and Uttar Pradesh in mother and childcare (National Health Mission 2019).

Surveillance and Awareness

Public health surveillance is the continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice. It includes assessing and maintaining record of health status of the community through periodic monitoring to identify risks, determinants, needs, groups at higher risk, and community resources. It also includes regular epidemiologic investigations through public health infrastructure like collection centres, laboratories with rapid screening and large volume testing capabilities.

On disease surveillance front, National Centre for Disease Control (NCDC) which runs Integrated Disease Surveillance Program (ISDP) addresses this component to some extent. As per IDSP website, the program, started in 2010, has had a consistent budget of 60-65 Cr, which has never been completely spent. The network of laboratories seems inadequate at 114 in whole of the country (Directorate General of Health Services n.d.). There is a number of national disease programs with surveillance components, and some with screening component as well. In absence of consistent monitoring and maintenance of population health registries, it is impossible to assess effectiveness of NCDC and other institutions engaged in this component. Major national programs like for Malaria, TB, AIDS, and Polio have specific surveillance component.

Recent outbreak of a new coronavirus (CoV) strain in China has travelled to Thailand, Korea, Malaysia, Sri Lanka, Nepal, Japan, Germany, France and even the U.S. and Canada. This has once again, after swine flu of 2009, and SARS, MERS, Ebola and Nipah of 2010s highlighted the global risks when it comes to tackling infectious diseases (World Health Organisation 2020) (Reuters 2020) (Devnani 2020). India (#57) is ranked behind Thailand (#6) and Indonesia (#30) on global health security Index (GHSI). Based on 140 parameters, GHSI represents ability of 195 countries to prevent, detect, and respond to public health emergencies (Nuclear Threat Initiative 2019). The International Health Regulations (IHR) of WHO is a global agreement to control epidemics and pandemics and improve health security signed by 196 countries, including India, in 2005. However, India is one of the very few countries which have not published a joint external evaluation (JEE), which is an external assessment of national capabilities to achieve IHR objectives (WHO 2019). It is desirable for India to go for such assessment in order to create the level of preparedness required to address global health risks.

The issue of antimicrobial resistance (AMR) is of grave concern in India with global effects, the extent of which is unknown, but estimated to be high owing to high burden of infectious diseases. (Harris 2014) (Pitout 2010). A 2013 study estimated that more than 58,000 babies die in India due to ‘superbugs’ (Laxminarayan, et al. 2013). A few

national programs carry guidelines for appropriate use of antimicrobials but not all. There is no national database on AMR in different pathogens, and it varies throughout the country. Revised National Tuberculosis Control Program generated some useful data on drug resistance in Tuberculosis, but such cases are limited (Kumar, et al. 2013). AMR has increased due to indiscriminate use of antimicrobials driven by unqualified and unlicensed medical practitioners, easy access to drugs, and non-therapeutic use on animals to increase productivity. AMR is a serious threat to population health as it leads to longer periods of sickness and treatment, increasing cost and at times morbidity and mortality, also longer reservoir of infections putting others in the community at higher risk (Willis and Chandler 2019) (Kumar, et al. 2013).

In 2017, Union Government came up with National Action Plan for AMR and there was an inter ministerial consensus on AMR highlighted in Delhi Declaration on AMR. The NAP recognises the need for a robust surveillance system. "Aside from the absence of a One Health[1] approach to surveillance, another weakness of the existing surveillance systems for AMR in India is that it does not account for antibiotic use. The existence of a surveillance system that can establish the relationship between the antibiotic consumption patterns and emergence of AMR is vital to producing evidence that may help in the designing and evaluation of effective interventions." (Ministry of Health and Family Welfare 2017)

The issue of escalating disease burden and mortality due to NCDs needs attention. The cardiovascular diseases, chronic obstructive pulmonary disease (COPD) and asthma, and diabetes have emerged as the top three NCDs in India. "In absolute terms, cardiovascular diseases, respiratory diseases, and diabetes kill around 4 million Indians annually (as in 2016), and most of these deaths are premature, occurring among Indians aged 30–70 years". The fact is that, to date, India does not have a reliable data on prevalence on NCDs, as large proportion of those suffering go undiagnosed due to lack of awareness and access to adequate healthcare facilities (Arokiasamy 2018).

In addition, there are significant variations in prevalence of and mortality due to NCDs among different income groups and across states. Share of mortality due to NCDs in highest among high income group at 77%, and high in middle income group at 50%. Lower income groups, with highest years of life lost per 1000 population (at 234) show 69% of mortality due to communicable diseases (Taylor 2010). The Global Burden of Disease study categorised Indian states based on the epidemiological transition levels (ETL). In general, there is higher prevalence of NCDs among high and higher middle ETL states such as Andhra Pradesh, Goa, Himachal Pradesh, Kerala, Maharashtra, Punjab, Tamil Nadu, and West Bengal. But a finer data shows that cardiovascular diseases with 28.1% burden of mortality in India in 2016 were highest in high and higher middle ETL states. The respiratory diseases with second highest mortality burden a 10.9% were higher in a mix of a mix of lower- middle, higher-middle, and high ETL states Jammu and Kashmir, Himachal Pradesh, Uttarakhand, and Haryana. In 2016, diabetes was especially prevalent in southern states (India State-Level Disease Burden Initiative Collaborators 2017).

The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke launched in India in 2010, recognising the need has a component on screening to diagnose NCDs (Yadav and Arokiasamy 2014). It requires expansive efforts to create awareness about NCDs, reduce risk factors, and generate reliable real time data

1 One Health is "the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals and our environment" promoted by World Health Organisation

and information about patterns of morbidity and mortality to identify and treat population groups at higher risk.

There is a large number of studies pointing to lack of awareness among Indian population regarding their own health. This characteristic is spread across lifespan, and across disease burden. “Adequate knowledge regarding breastfeeding practice was found in only one-third of the antenatal mothers in two studies. Moving ahead in the lifecycle, a study in urban Haryana found that only 11.3% of the adolescent girls studied knew correctly about key reproductive health issues. A review article on geriatric morbidity found that 20.3% of participants were aware of common causes of prevalent illness and their prevention” (Kasthuri 2018)

The impact of awareness on reducing disease burden can be gauged from the evident success of anti-dengue campaign in Delhi. An intensive online and offline campaign helped create awareness about how the disease spreads, and how an individual can prevent the such vector borne diseases. At the same time, the participation of celebrities seems to have resulted in larger participation. The number of dengue cases in Delhi has reduced considerably at around 1700 from more than 4000 in 2016, 2017 and above 2500 in 2018. In 2015, the number was unusually high at around 16,000 cases reported (TNN 2018) (Outlook 2019).

Access and Financing

The debates delve deep into issues in access to healthcare. In India, it seems principles laid by the Bhore Committee and Alma Ata declaration which defined Health as a Right, turned into a limited understanding of the WHO’s Universal Health Coverage (UHC), which is now perceived to be access to healthcare and not all the public health services. In absence of adequate financial resources, low capacity of the institutions and lack of legal and policy framework; the effect is that universal has remained targeted, health has remained healthcare and coverage has been limited to some variant of a public funded insurance scheme.

The hospital centric view of healthcare, got impetus in 2000 when 100% FDI was allowed in hospital sector through automatic route. Subsequently, in 2003, Hospital sector got the status of ‘industry’ facilitating cheaper loans, reduction in custom duties and so on (Hooda 2015). Today, on one side India has some of the largest corporate hospital chains that are able to reduce costs owing to economies of scale and not only make smaller providers fight for survival in domestic healthcare industry, but also attract patients from abroad (Altstedter 2019). On the other, we have deep inequalities in terms of health status across the country, inter- and intra-state. Some of the communities, such as indigenous peoples in remote areas are the worst victims of this disparity (K. S. Rao 2017).

Financing

Prime among barriers in access to healthcare is financing. The budgetary allocation in the latest Union budget at 2.25% of total expenditure is the highest ever. Combined with expenditure of the States, the total on public expenditure stands at 1.4% of the GDP. This figure falls short of even the 2% target outlined by GoI in 2010 (Yadavar 2019). As a result, the out-of-pocket (OOP) expenses in India are very high at 67% of total health expenditure (Ministry of Health and Family Welfare 2017), which push millions into poverty every year, and force 6% of the population to not seek healthcare at all (National Sample Survey Organisation 2006). The State has attempted to address this with publicly funded

insurance schemes like Rashtriya Swasthya Bima Yojana (RSBY). Merits and demerits of the scheme aside, the fact to note here is that the state has decided to forego its role as provider of an essential publics good, and has decided market forces to address the needs. Since similar logic has been extended into latest initiative (Ayushman Bharat) of the Union Government towards UHC, let's examine what schemes like RSBY have been able to achieve.

RSBY targeted 65 million families, with around 41 million enrolled into the scheme by 2016. Under this, poor families getting annual coverage of INR 30,000. As per a 2017 study, RSBY was able to cover only half of the Below Poverty Line (BPL) households. The hospitalisation rate among RSBY insured individuals remained low at around 1%. On average for general population, this figure stood at 2.6% in 2014. The variation across states, from 0.1% in Rajasthan to 4.8% in Kerala goes on to show just how important looking at all the components of public health together is, for any intervention to succeed. Similar status can be seen at state level insurance schemes, for example in Maharashtra where utilisation rate of state sponsored insurance scheme started in 2011 remained less than 0.2% till 2014 (Ghosh 2018).

There is no evidence that insurance schemes have been successful in reducing OOP expenses. There is, however, plenty documentation of failures of such schemes on the front of overtreatment or unwarranted surgeries. The drastic variation in usage and effects of such schemes point to a bigger problem. Such schemes aim to solve only one aspect of only the demand side issues in Healthcare. Issues in linkages, capacity and supply side issue has been conveniently ignored. Since, private hospitals have lion's share of capacity (45% beds and 80% human resource), and private hospitals tend to be concentrated in urban areas; such schemes are bound fail to deliver desired outcomes (Bakshi, Sharma and Kumar 2018). Further, the design flaws in the schemes which seldom do not cover for out-patient service, cost of medicines, etc. aggravate the problems further.

Although, it is seen as an incremental step towards achieving UHC, the Ayushman Bharat (AB) extends the same logic of RSBY hospital based care to a grander scale. AB provides for covering 100 million families or 500 million citizens for INR 5 lakh annually, which does not seem to be plausible with the current budgetary allocations. The conservative estimate of premium payment per family is INR 5,000 annually, that means a total premium payment of INR 50,000 crores. Even with NITI Aayog's estimate, this payment stands at 10,000 crores. Compared with similar RSBY variant announced in 2016 budget with 1 lakh cover had allocation of INR 1500 crores, and it was never launched. AB, with higher target population and higher coverage was rolled out with allocation of just INR 2000 crores in 2017-18, and saw an increase to INR 3200 crores in 2018-19.

Apart from that, AB provides for converting Sub-Centres as Health and Wellness Centres (HWC) with allocation of INR 1,200 crore for 1,50,000 sub centres (INR 80,000 per SC per year) (Press Information Bureau 2018). The reality, however, that services envisaged in a HWC are not even available at Community Health Centres (CHC), and over 25% of SCs require a building to be constructed (Ministry of Health and Family Welfare 2017). More than 80% CHCs reported shortfall of a surgeon, a physician and a paediatrician; and around 75% reported vacant posts of a gynaecologist. Even if the government is able to allocate sufficient funds for well functioning HWCs, it stands to undermine primary health services and not matching it with proper referral setup may be counter productive in the long run (Bakshi, Sharma and Kumar 2018).

Human Resources

The other big barrier in access to healthcare in India is the critical shortage of manpower. As to healthcare personnel in public sector in rural India, as on 31 March 2017, there were 14,350 medical officers, 4156 specialist doctors, and 2129 radiographers at 5,624 CHCs (a shortfall of 2168 CHCs); 27,124 doctors, 22,351 auxiliary nurse midwives (ANMs), 14,267 lady health visitors (LHVs), and 12,288 male health assistants at 25,650 Primary Health Centres or PHCs (a shortfall of 6,409 PHCs); and 198,356 ANMs and 56,263 male health assistants at 156,231 sub-centres (a shortfall of 34,946 from required number). Adding 70,738 nurses, 25,193 pharmacists, and 18,952 lab technicians, we get a total of 466,167 healthcare personnel in rural areas in public sector (Ministry of Health and Family Welfare 2017).

This translates to 5.3 healthcare personnel per 10,000 people. This figure stood at 4.8 for doctors, nurses and midwives as against WHO benchmark of 25.4 per 10,000 people. The deficit of 20.6 doctors, nurses and midwives means that around 80% of rural population does not have access to public healthcare services. At national level, a 2011-12 estimate suggests that density of doctors, nurses and midwives was about 13.4 per 10,000 people. After adjusting for educational qualification, it stood at just 6.4. The health manpower in India is not only inadequate, it's distribution is skewed too. With around 70% of the population, rural areas have only 40% of all health workers. The critical shortage of healthcare personnel in rural areas in public sector leaves the population dependent on private healthcare providers. The cost of private healthcare becomes additional barrier to access for rural population (Saikia 2018).

Within NRHM, a program on Accredited Social Health Activists or ASHAs was launched in 2005. It is aimed at training a cadre of women health activists at village level which work for incentives. It has been one of the major catalysts in improvement of health indicators, largely with creating awareness about health, ensuring rural women access

institutional mechanisms to manage their health requirements. Along with that, they carry essential provisions such as Oral Rehydration Therapy (ORS), Iron Folic Acid Tablet (IFA), chloroquine, Disposable Delivery Kits (DDK), Oral Pills & Condoms, etc. to address last mile access (National Health Mission 2020). As of 2017, there are 8.8 lakhs ASHAs in the country (National Health Mission 2017).

There are multiple issues, prime among them is the low amounts of incentive they receive for wide array tasks that they perform. Before October 2018, ASHAs received an incentive of INR 1,000 per month for routine and recurring activities including line listing of households, maintaining village health register, preparation of various lists of children, mothers and couples eligible and due under various schemes, etc. From October 2018, it has been revised to INR 2,000 per month (Jhalani 2018). Second, time spent by ASHAs on these tasks is high. In a recent study on time use of ASHAs found that they worked at least 3-5 hours a day, meeting requirement guidelines. The guidelines also require them to work 3-5 days a week, however, ASHAs worked for six days, and reported being in call 24X7 in their villages in case of emergency (National Health Mission 2017). In addressing acute shortage of health workers, ASHAs are well primed for upskilling, training in assistance at PHCs or trained into ANMs etc.

The ecosystem of medical education, and public health education and training leaves a lot to be desired. There has been proliferation of medical education institutions post 1990. From 156 (109 govt., 47 private) in 1995 to 381 (176 govt., 205 private) in 2013, medical colleges in India have risen at a rapid pace. With intake of around 50,000 undergraduate (MBBS) and 22,000 post graduate students, the total capacity of these colleges to produce medical professionals is still below requirement. Further, there is a dominant trend of increasing private institutions than govt. institutions. Various studies relate this expansion, especially in the private sector, with flourishing corruption, poor infrastructure, and shortage of competent teaching staff (Solanki and Kashyap 2014). Curriculum reform, defining accreditation standards and faculty development are other issues with medical education in India (Sood 2008) (Supe and Burdick 2006). The public health education that is equally important and very different form medical education requires a different approach and a big effort for meeting required manpower for Indian public health system.

Medical Education and Practice

In India, there is a serious lack of medical professionals, as described in the previous section. Health education and management of institutions in India has been in the news with from a long time. The first decade saw serious corruption scandals brought out in the open, which questioned the governance of Medical Council of India. Subsequently, judicial review of the entrance procedure and the institutional mechanism, etc. kept the governance issue alive (Solanki and Kashyap 2014) (Sood 2008). Recently, corruption-ridden Medical Council of India was replaced with a National Medical Commission with passage of the National Medical Commission Act (NMCA) 2019 in the Parliament in August 2019. The NMCA has been criticised on three major issues. First, the provision that fee for only 50% of the seats in private colleges can be regulated by the state, as against 85% earlier. That means the management quota has now increased from 15% to 50%. This, critics say, is a way to corporatisation of medical education in the country, with higher room for corruption (Rajalakshmi 2019).

Second, the Act provides for Community Health Providers (CHPs), who are persons

"connected with modern scientific medical profession", to supplement health services at preventive and primary care level. At secondary and tertiary level, CHPs to work under supervision of medical practitioners. Since, there is no qualification exam such as National Exit Test stipulated in the Act for CHPs, there is a lot of ambiguity on who these CHPs are going to be. Third, the provisions regarding ensuring transparency and eligibility of members of the commission are not strong enough. The members can have commercial interests in the health sector and they can be employed by any institution after demitting office which they did not deal with during their term. The Act provides for a two-year moratorium on employment in institutions that the members dealt with during their term. Such provisions open wider room for corruption, or worse policy capture. On the whole, the NMCA is anti-federal, pro-private sector and compromises on standards of health services while not ensuring highest levels of transparency that it set out to do in the first place (Rajalakshmi 2019).

AYUSH

A greater role for Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH) systems of health and wellbeing has been envisaged within Indian health system with National Rural Health Mission (NRHM) from 2005. Given the state of health system in India, the department of AYUSH was restructured into a Ministry in 2014 with a renewed push to utilising the latent potential of the traditional, complementary and alternative medicine. Within NRHM it meant contractual appointment of AYUSH practitioners in community health centres and primary health centres along with support from existing staff, establishment of specialised centres for therapy, involvement of AYUSH practitioners in national programs, and inclusion of AYUSH drugs in health kits of community health workers (Lakshmi 2012).

On supply side, there have been challenges for AYUSH practice and mainstreaming within the system. Post inclusion in NRHM as a mainstreaming effort, AYUSH practice has suffered from "variability in the basic philosophy of practice; disparities in the approach to specific clinical conditions or in decision-making; the lack of specific guidelines to promote cross-referral; unfilled positions; inequitable compensation; minimal support in terms of logistics and infrastructure; an unexpected rise in cross-practice; ethical issues (such as unfriendly relationships between practitioners of either system); and the absence of public accountability mechanisms at the primary care level" (Shrivastava, Shrivastava and Ramasamy 2015).

As to utilisation of AYUSH services, a recent study based on NSS data from 71st round (2014) shows that "about 6.9% of all patients seeking outpatient care (with reference period of last 15 days) had used AYUSH services (3.5% Indian Systems of Medicine or ISM and 3.0% homeopathy)." It also concluded that "patients with higher educational status are more likely to use AYUSH services. It also emerged that AYUSH use is relatively low among patients in the middle MPCE quintiles." The study indicated that of total ISM based out-patient care in rural areas, only about one-fifth was provided at PHCs or CHCs. It is also noteworthy that analysis pointed out that "while the overall share of AYUSH medicine in total medicine expenditure was only about 6% but the average AYUSH medicine expenditure per AYUSH treated person (Rs. 270 in rural and Rs. 378 in urban) did not hugely differ from average allopathy medicine expenditures (Rs. 392 in rural and Rs. 454 in urban)" (Rudra, et al. 2017).

The AYUSH systems may be too many systems clubbed together, without adequate standard setting, institutions for certification of practitioners or accreditation of facilities. With better end to end institutional ecosystem and medico-legal definition, the utilisation as well as effectiveness of AYUSH systems stands to improve. The envisioned goal of introducing these systems, that is, to supplement existing formal medical care will be achieved when these systems are also codified and education, practice, manufacture of medicines are recalibrated and formalised.

Research

India established Department of Health Research (DHR) under MoHFW in 2007, for this purpose. Indian Council for Medical Research (ICMR) is only national institution under DHR performing this function. Apart from that, there are institutions like Public Health Foundation of India (PHFI), having significant capacity, and other private institutions engaged in public health research. The budget of DHR in 2015-16 was INR 1144 Cr, of which ICMR received INR 894 Cr or around 80% of total. Over the years, DHR's share out of meagre Health budget has remained around 3%, which is inadequate as research studies indicate.

In a dated study, it was found that, out of total health research output in India in 2002, less than 4.4% pertained to public health. The figure was 3.3% for original research in public health (Dandona, et al. 2004). Another study indicates that in the decade ended in 2010, disproportionate share (~60%) of public health research catered to communicable diseases, maternal and neonatal health, and nutritional disorders, categorised as GBD1 (Global Burden of Disease-1) with 39% share. Non-communicable diseases and mental and behavioural disorders or GBD2 having highest share ~50% had only ~31% of research output. Studies on injuries with 10% share of disease burden was just 7% (Kalita, Shinde and Patel 2015).

Moreover, geographically, the research is skewed, with states like Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Rajasthan, Orissa, Uttarakhand and Uttar Pradesh, were location of just 10% of published studies. More than 40% of the research came from institutions in just Delhi, Maharashtra and Tamil Nadu, with only 1.4% located in the North East. Of total, a little more than two-third were funded by foreign donors (Kalita, Shinde and Patel 2015). Comparatively, the proportion in Brazil and China is 2.2%, and 8.8% respectively. In these two countries, more than 70% of total health research funding came from public sector. The reliance on foreign funds for public health research seems to be the reason for indicated disparity of distribution across diseases and geography (Dandona, et al. 2004) (Kalita, Shinde and Patel 2015). It shows how inadequate budgetary allocations for the Department of Health Research are.

Another study conducted in 2016, took stock of medical research in Indian medical colleges. Of 579 medical institutions and colleges, only 25 published more than 100 research papers a year and accounted for 40% of the research output in the country. Almost 60% of colleges did not produce any research paper at all. Globally, places like the Mayo clinic and the Massachusetts General Hospital on an average produce 3700 and 4600 research papers every year. It was found that majority of the 25 top research producing institutions were publicly funded. However, overall level of medical research output from India was considered to be poor (Ray, Shah and Nundy 2016).

From above, the issues in health research, therefore, are very less focus on public health

research and more on medical research. Within limited number of public health research studies, there is disproportionate emphasis on particular disease burden. Also, the research focuses more on few locations and distribution across states is skewed. An unusually high amount of public health research is funded by overseas donors. Medical research is gauged to be too little and too bad. Herein, public institutions are seen as making best use of the resources put in research.

Conclusion

Health system in India is chronically sick, and it requires a long term innovative solutions to get better. The interconnectedness of health system with food, employment, education and other systems is well established and cannot be ignored any further. For example, the fact that cardiovascular diseases are the highest cause of mortality in India is due to tremendous increase in risk factors such as air pollution, high total cholesterol, high fasting plasma glucose levels, high body-mass index (Arokiasamy 2018). All these risk factors emanate from other systems and subsystems. The health system in India has to be placed within larger social policy milieu in the country for better resource utilisation and tackling the social determinants of health. A systems approach is needed in understanding and the policy formulation to address the ever growing challenge with limited resources.

Like any developing country, India's health system is marred with systemic issues of low public spending; limited institutional capability in public sector to address the gaps in surveillance, awareness, access and quality of healthcare services; inadequate manpower; and geographical disparities and rural-urban dichotomy. There are, however, a few peculiarities, be it in dual burden of communicable and non-communicable diseases or availability of incredibly low cost treatments for most difficult of medical procedures. To begin addressing the challenges, it requires investment in public health research, especially implementation research, for generation of credible data and knowledge to guide innovative policy solutions. The challenge at hand is too complex and too large to be handled by either public sector or private sector or non-profits alone. The declared intention of the government to utilise private sector to fill the gaps in public system to meet the aim of universal health coverage may be a step in the right direction. However, as stated earlier, given that private sector is already dominant in both out-patient and in-patient care, the government must do what it is in the best interest of the citizens, and guide the progress of health system through better policies, effective regulation and unrelenting enforcement.

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