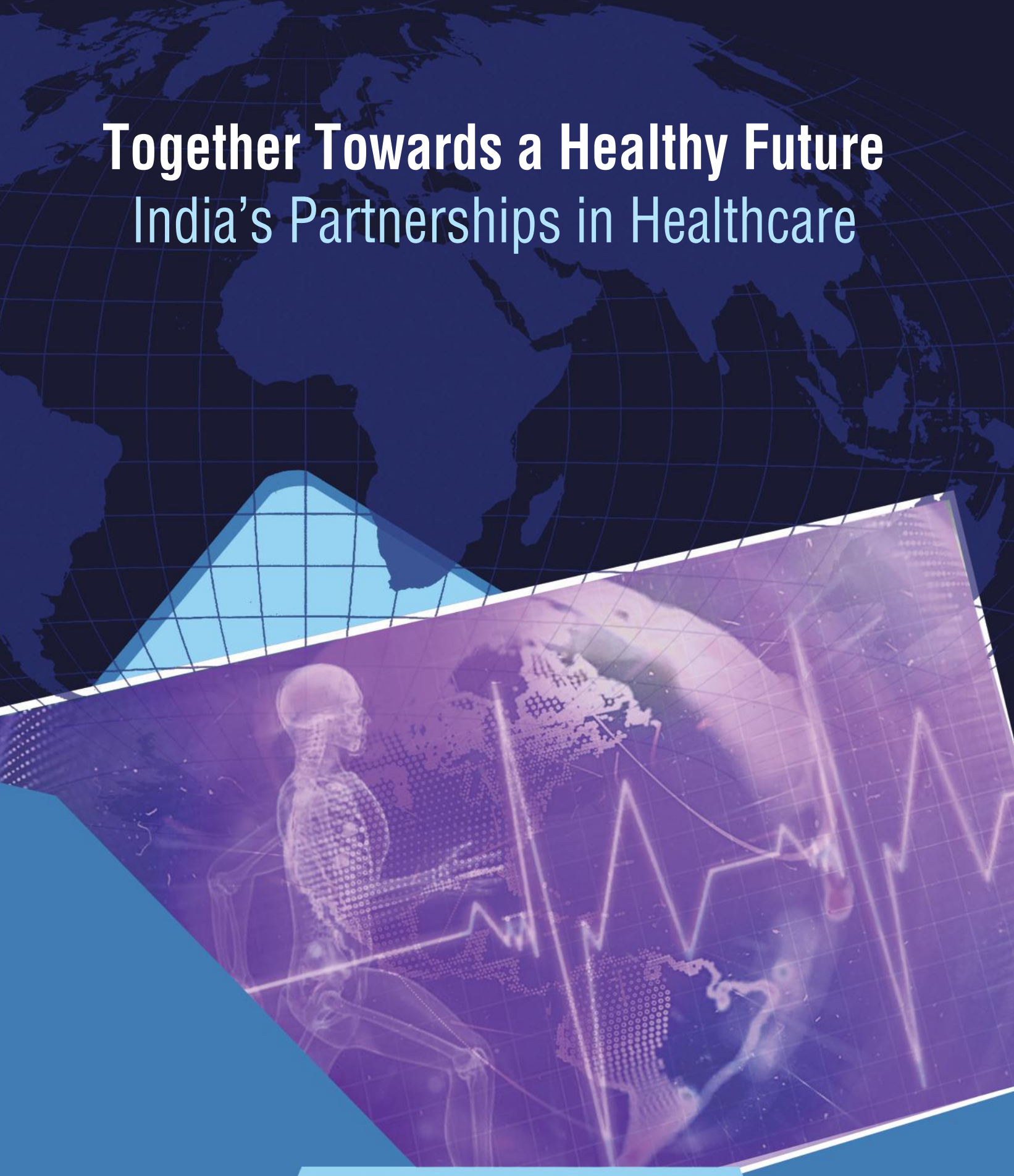
Together Towards a Healthy Future

India's Partnerships in Healthcare



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Research and Information System
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विकासशील देशों की अनुसंधान एवं सूचना प्रणाली

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T C James

Apurva Bhatnagar

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Ambassador (Dr) Mohan Kumar
Chairman, RIS

Foreword

Over the years India's development cooperation with partner countries has multiplied across various sectors, health being the most important among them. The very idea of these partnerships also aims to share India's own development experiences in recent past with fellow developing countries. The Prime Minister of India has led the launching of Ayushman Bharat Yojana, which is a major step forward for universal health coverage in India. In fact India has emerged as a capital of low-cost generic medicines and cost effective vaccines to provide health coverage to those who have largely been excluded from the formal health care sector. In order to study further these issues, RIS has recently launched the Global Development Centre through which intensive research of this nature would be taken forward.

I have great pleasure in congratulating our team at RIS for bringing out this timely publication on "Together Towards a Healthy Future – India's Partnerships in Healthcare" when the world would be celebrating 40th anniversary of BAPA which stands for technical and economic cooperation among developing countries, during the Second High-Level UN Conference on South-South Cooperation (BAPA+40 Conference) to held in Buenos Aires on 20-22 March 2019. India's expertise in modern and traditional medicines, along with a combination thereof with other practices of well-being like Yoga, would provide greater scope for cooperation among developing countries in health sector.

This document highlights India's commitment for promoting development cooperation further for ensuring health coverage for all. I am sure it will serve as a valuable reference point for policy makers, researchers, practitioners and other stakeholders.

(Mohan Kumar)

Prof. Sachin Chaturvedi
Director General, RIS

Preface

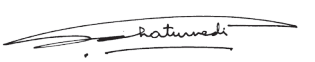
Health is one of the few sectors where India has been engaged right from early years of its independence. Indian expertise in allopathy, ayurveda and other forms of AYUSH has been the focus of its development partnerships, particularly in the continent of Africa. The recently launched e-VBAB (e-VidyaBharati and e—ArogyaBharati) proves significance of ICT prowess that India has in providing tele-education and tele-medicine.

'Together Towards a Healthy Future – India's Partnerships in Healthcare' is a publication that captures the essence of India's development partnerships in the realm of health sector. The publication is focused on Africa and other developing countries and builds on an earlier publication of RIS brought out in 2015 with the title 'India-Africa Partnership in Health Care: Accomplishment and Prospects'. Further, the current publication highlights much larger set of partnerships with a wider context. The volume also discusses India's development cooperation with the Global South which is consolidated around the 'Theory of Development Compact' that includes elements like trade and investments, capacity building, lines of credits and concessional grants in aid.

The cooperation in health sector, over the years has become a vital component of the process of promoting India's partnership with the South across all the five modalities mentioned above. India's engagement with other countries in the health sectors has been growing at a rapid pace in the areas like export of high quality low-priced Indian pharmaceuticals, setting up of manufacturing units and health care infrastructure in foreign lands, medical treatment, telemedicine, capacity building, traditional medicine, etc. Following the India-Africa Forum Summit, we have also multiplied our exchange of goods, services and dialogue with Africa. For example, India surpassed France and became the leading supplier of pharmaceutical products to Africa. All these and several other developments, particularly in the field of health, are captured in this study.

The present study also focuses on India's partnership in the health sector with other developing countries, particularly in South Asia. It records and analyses the important developments in the fields of health care sector, traditional medicine, trade of pharmaceuticals, medical treatment, capacity building, exchange of human resources in the region, etc.

Over the years, RIS has been engaged in providing policy research inputs for promotion of South-South cooperation in various sectors, including health. This assumes added importance, considering the similar challenges and obstacles that are faced by the South. Focus is on moving forward together towards attaining the Sustainable Development Goal 3 that calls for ensuring healthy lives and promoting well-being for all age groups. I would like to place on record my deep appreciation for the hard work that Prof. T.C. James and Mr. Apurva Bhatnagar have put in for shaping this study well in time. Thanks are also due for RIS publication team led by Mr. Tish Malhotra, under the supervision of Mr. Mahesh Arora, Director (Fin. & Admn.). The publication could become possible due to their intense efforts. We sincerely hope that it would be found useful by all the stakeholders across the board.



Sachin Chaturvedi

Chapter I

Introduction

The provision of affordable and appropriate health care is a key component of global development. Strong evidence suggests that national capabilities that support innovation and technology have significantly contributed to the reduction of healthcare costs in developing as well as developed countries (Sampath 2010; Srinivas 2006). This warrants investments in human resource development (HRD) and Research and Development (R&D) in pharmaceutical sector with a view to developing local capabilities. Achieving universal healthcare (UHC) is a major challenge for most developing countries. Addressing new areas such as mental health, non-communicable diseases and geriatrics are issues that face developed countries and now many of the developing countries. The Sustainable Development Goals (SDGs) 2030 envisage a cooperative approach by all towards this. This opens up scope for learning from the experiences of each other, especially since most of the developing countries, half a century ago, were almost at the same level of constraints in this regard. In the post-colonial era, some of them could successfully tackle many of those challenges and forge ahead. India has certain good experiences which it can share with others, while also learning from others about their best practices.

India's Development Compact

The years immediately following the end of the world war II witnessed North-North developmental assistance under the Marshall Plan (European Recovery Programme) to aid Western Europe to recover from the ravages of the war. The decades following the war also saw the independence of countries of the South from their colonial masters. In the case of most of these countries, their economies were in a shambles and their social indicators like health and education were at very low levels. Even as consumer markets, they were not very attractive. The developed world initiated development grant programmes for the newly independent countries. Toward the end of the century, many of them were able to pick up speed in their economic and social developments. At the same time, economic slowdowns in the developed countries also posed new challenges. The South-South Cooperation (SSC) concept could be adduced to this scenario. India, though, was a late starter in the road to liberalization, having initiated the same in 1991 only. But thereafter it moved briskly and by the beginning of the twenty-first century was considered one of the emerging economies. Meanwhile, the concept of SSC, as different from the then existing Washington Consensus model of Structural Adjustment Programmes led by Bretton Woods institutions, was being honed in by economists like Mahbul Haque, Arjun Sengupta, etc.

The new model differed considerably from the aid-directed development model. For one, this is between the countries of the South who, naturally have more empathy to the needs of their partners. For another, it is more into development capacities. Chaturvedi (2016) says that the new development compact context, in its stress on policy coherence is aimed at supporting all-round development of the partner country, not through meeting any specific undertaking nor any commitment to conditionalities. The

stress is on self-reliance rather than on economic aid. According to him, the concept works at five different levels, namely, trade and investment, technology, skill upgrade, Lines of Credit (LoCs) and grants.

India, because of its empathy with other developing countries, had from the time of its Independence in 1947 been trying to extend whatever assistance it could, though in a very limited scale, to those countries. Initially these programmes were aimed at capacity building through the Indian Technical and Economic Cooperation (ITEC) programmes in Asian and African countries and in some of the neighbouring countries. Comprehensive infrastructural development programmes including setting up of institutions were also taken up in some of the neighbouring countries. India's role in the Colombo Plan (1951) amply reflects the dichotomy of its position, being a receiver of economic and technical aid from countries like, UK Australia, Canada, etc., and at the same time offering assistance to other developing countries in the form of scholarships for technical training. India followed three key principles in these programmes; partnerships are for mutual benefit, development partner is to decide the priorities, and aim of the partnership is to be to create higher level of capacity and economic opportunity for both partners. The partnerships should not lead to long term dependency by the recipient on the provider.

India's early investment in medical education and research enabled it to generate large of community of quality health professionals which offered India an opportunity to send health professionals to other countries and also to extend medical education facilities in India.

Low-cost Generic Medicines

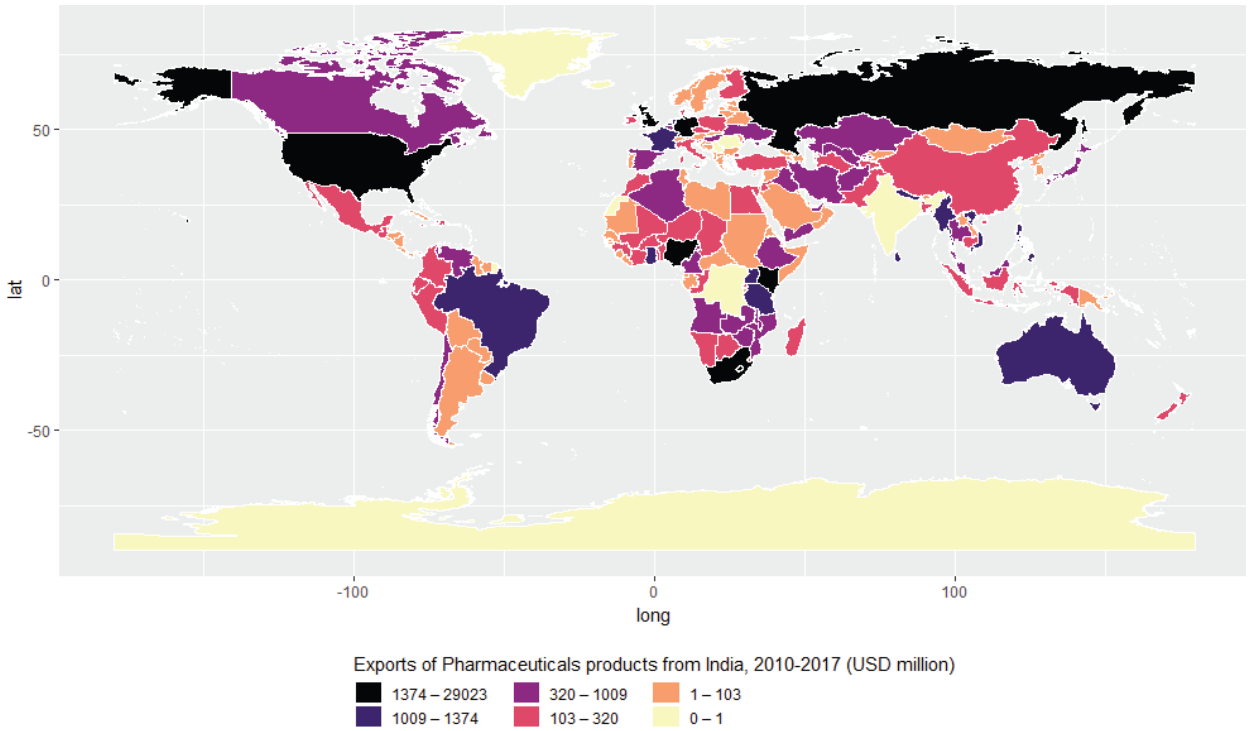
India's manufacturing capacity in pharmaceuticals at the time of its Independence was limited, forcing it to rely on costly and scarce imports for meeting the requirements of the population. Developments instrumental in the growth of Indian pharma industry include institutions like Drug Controller General of India (DCGI), which enforced Good Manufacturing Practice (GMP) and Good Laboratory Practice (GLP) regulations and modification of Drugs and Cosmetics Act, 1940 to improve quality of pharma products including clinical trial regulations. The government supported a wide network of R&D institutes working on pharmaceuticals. The existence of patent protection for pharmaceuticals as per the Patents & Designs Act, 1911 had adversely affected the development of local industry; also, given the then state of research and development in pharmaceuticals in India, India could not hope for big breakthroughs. The country, therefore, after considerable discussion, opted for a regime of excluding pharmaceutical products from patents in the Patents Act, 1970. Coupled with industrial and health policies, this led to the development of a robust Indian generic industry which even now provides most of the low cost generic medicines to the world.

The dependence of the world on Indian pharmaceutical products earned it the sobriquet of 'the pharmacy of the world'. The ten countries leading in gross import of pharmaceuticals from India during the period from 2010 to 2017 are United States of America, Russia, South Africa, United Kingdom, Nigeria, Kenya, Germany, Brazil, Australia, and the Netherlands. Note that three of them belong to the African region. Figure 1 brings out the position of world's dependence on Indian drugs graphically.

Vaccines

Another major component of universal health care is ensuring access and delivery of vaccines. Modern healthcare stresses a lot on prevention of diseases through the use of vaccines, but, the price, availability and delivery mechanisms remain a major challenge for countries. Burden of disease is almost 93 per cent in developing countries while vaccine sale is around 15 per cent only highlighting the dimensions of the problem. India has been, through policy interventions during the last few decades, able to address this issue with relative success. Annexure table A5 shows the major immunization coverage in

Figure 1: India's Export of Pharmaceutical Products to the World, 2010-2017



Source: WITS Comtrade Database.

India, African countries and neighbouring South Asian countries. The table clearly indicates that India has surpassed global averages when it comes to immunization against major illnesses like Polio, measles and Hepatitis B. Within India, a large market was created as domestic firms made vaccines accessible to local populations and emerged as key suppliers to World Health Organisation (WHO). India is the major supplier of vaccines to the United Nations International Children' Emergency Fund (UNICEF) also which, in turn, supplies about 40 per cent of total vaccine demand for childhood vaccination in more than 100 countries. India is a major partner in the GAVI, the Vaccine Alliance, a Public Private Partnership (PPP) initiative to increase access to affordable vaccines in the developing world.

Traditional Medicine

Issues such as serious adverse side effects on regular use of many of the drugs and also increasing trend of anti-biotic resistance have been persuading many countries to turn towards traditional medicine (TM) sources for healthcare as an alternative way to wellness. India is one of the countries with well developed Indian Systems of Medicine (ISMs), i.e., Ayurveda, Siddha, Unani and Yoga which have provided the much needed alternative in healthcare due to their efficacy and accessibility, both physically and financially. Recent policy initiatives have further pushed towards integration of these systems in the mainstream healthcare delivery. These include the National Health Policy 2017 and National Intellectual Property Right Policy 2016. Health insurance today also covers ISM treatments. A stand-alone Ministry of AYUSH has been established in 2015 to further promote the TM sector in India and abroad. While the known efficacy of one form of ISM, i.e. Yoga, has been established worldwide, promoting quality assurance of other forms of drug and non- drug therapies of ISMs has been initiated. These include development of Good Manufacturing Practices (GMP) and Good Clinical Practices

(GCP) guidelines, rules and guidelines for licensing, export promotion schemes like quality certifications for ISM products and certification of yoga professionals to popularise ISM treatments through quality benchmarks. Bilateral MoUs with Pharmacopoeia Commissions of countries like US have recently been concluded and cooperation on traditional medicine has been a part of the dialogue at multilateral fora such as BIMSTEC and BRICS. A chair for AYUSH has also been established at WHO. All these initiatives point to the steadily growing acceptance of ISMs globally. The Forum of Indian Traditional Medicine (FITM) established by the Ministry of AYUSH at RIS is also another effort towards policy research aimed at promotion of ISMs in India and abroad. Studying India's experience in regulating this sector may provide learning lessons for other countries.

South-South Cooperation in Health

The Nairobi outcome document of the High-level United Nations Conference on South-South Cooperation, held on the thirtieth anniversary of BAPA, stressed that South-South cooperation is "an important element of international cooperation for development, offers viable opportunities for developing countries in their individual and collective pursuit of sustained economic growth and sustainable development".[1] The document described the process of SSC as "a common endeavour of peoples and countries of the South, born out of shared experiences and sympathies, based on their common objectives and solidarity, and guided by, inter alia, the principles of respect for national sovereignty and ownership, free from any conditionalities. South-South cooperation should not be seen as official development assistance. It is a partnership among equals based on solidarity." It is "a multi-stakeholder approach, including non-governmental organizations, the private sector, civil society, academia and other actors that contribute to meeting development challenges and objectives in line with national development strategies."[2]

In the aspirational goals of nations, ensuring the health of the people is one of high priority since an unhealthy population is an economic burden. Ensuring healthy lives and promoting well-being for all at all ages is one of the sustainable development goals (SDGs). Since all individuals, both rich and poor, are concerned with personal health and well-being, it occupies the focus of all countries, whether developed or developing or least developed. The challenges being faced by a country vary from one country to the other. The economically more developed countries such as those in the West have achieved certain basic levels of health status like acceptable rates of maternal, neo-natal and under-5 child mortalities and have been able to contain communicable diseases. Their challenges now are in the areas of Non-communicable Diseases (NCDs) and Mental Illnesses. The developing countries present a kaleidoscopic picture of varied and changing levels of achievements in this area. The spectrum ranges from very poor health indicators in certain countries, particularly in sub-Saharan Africa, to some countries that compare well with the best advanced countries. There are countries like Cuba who have been able to provide universal health care at comparatively lower cost than many developed countries. This provides the South great opportunities and possibilities for cooperation among them.

Universal health care (UHC) has to provide for access to affordable quality health care for all people without any discrimination. This would necessitate having adequate health care infrastructure, medicines, medical devices and human resources. Since the fight against diseases is one between human ingenuity and microorganisms there is a constant need to update the arsenal with humans in the form of medicines and drugs and this requires significant investments in research and development (R&D), both knowledge and financial. In both the areas of access to medicines and medical equipments as well as R&D, Intellectual Property Rights (IPRs)

play an important role. The scope for cooperation among the global South consisting of developing and least developed countries, in other words, less industrialized countries, in the two areas of health and IPRs is large.

Some scholars look upon SSC in health as "state-state exchange of technical, financial, and human resources, and policy expertise and support among low and middle-income countries."[3] The contours of SSC got delineated through the Buenos Aires Plan of Action (BAPA) for Promoting and Implementing Technical Cooperation among Developing Countries in 1978, which was signed by 138 countries and endorsed by the United Nations (UN) General Assembly. The objectives of SSC, according to BAPA, are "mutual benefit and for achieving national and collective self-reliance, which are essential for their social and economic development".[4] The 40 years that have elapsed since the BAPA signing have seen momentous changes in the global political and economic landscapes and the perceptions of self-reliance now are different from those of the 1970s. The emergence of a global economy has brought in interdependence and mutually beneficial cooperation as more productive than isolated and secluded development. However, the basic principles of such cooperation, as different from the Washington Consensus based aid programme, as stated in the BAPA, still remain valid. They are "strict observance of national sovereignty, economic independence, equal rights and non-interference in domestic affairs of nations."[5] The Ministerial Declaration of Group of 77 and China in New York on 25 September 2009, among others, highlighted the following principles of SSC: They are (1) "based on a strong, genuine, broad-based partnership and solidarity",(2) "based on complete equality, mutual respect and mutual benefit", and (3) "respects national sovereignty in the context of shared responsibility."[6] Respecting and adhering to these principles in any SSC partnerships in health and IPR is what will distinguish them from the earlier models of cooperation or aid.

SSC in the health sector in the past has been broadly on the above lines. Many a time these cooperative endeavours involve more than two parties leading to emergence of South-South health networks (Chaturvedi and Mulakala, 2016) where the countries contribute on the basis of their strengths. The collaborations are in different areas like manufacturing, R&D, trade and so on. Setting up of hospitals and joint research centres have been components of SSC in health. India has collaborated with Brazil, China, Bangladesh, etc. on health biotechnology. Private players also played important roles in such collaborations. Provision of human resources, as in the case of Afghanistan, has been a major component of India's health collaborations. Africa has been a major partner in SSC in health. India has been engaged in the healthcare sector in Africa in a big way. The Pan Africa e-Network project, renamed as e-VidyaBharati and e-ArogyaBharati Network, covering 54 countries of Africa, with Africa Union as the coordinating agency, has tele-medicine as a programme. Under this programme, medical practitioners at the Patient End locations can consult on line Indian medical specialists in 12 super speciality hospitals in India. Five super specialty hospitals in Africa are also in the network. The Tele-Medicine network also provides continuing medical education services. (James, et al 2015)[7]. The focus of the project is local capacity building, as it should be in SSC. China and Brazil have also been engaged in such collaborations through various fora such as, IBSA and BRICS. Access to affordable quality medicine is a major concern in almost all countries of the South. This is an area in which much has been contributed by SSC in the past. India has been a major generic drug supplier of the world. In fact, its generic medicines significantly contributed to the containment of HIV/AIDS in Africa as well as in South America.

In the light of the commitments of all countries towards the achievement of health for all by 2030, the SSC can play a more active role than in the past. This is especially so as quite a good number of countries of the South have

miles to go to reach the set targets. In the matter of access to health care, many of them need to add significantly to their existing capacities in hospitals and dispensaries. Collaborative ventures, as per the requirements of the host country, can contribute in this. Health care also demands human resources and medicines and drugs. Countries like India in the past had provided health personnel in many countries. Apart from continuing to do so, they can also help in developing and expanding medical and paramedical education in other countries. In the area of medicines, there is need to develop local manufacturing capabilities in most countries. Joint ventures by countries who already have robust pharmaceutical industries such as China and India can boost this. These new ventures will have to keep in mind the paying capacity of the patients in the country where they are situated and not be unduly influenced by export potential to the developed countries. The joint ventures could also be vehicles for technology transfer in the relevant field. With patents on a large number of medicines having expired in the recent years and more on the way, generic drug production can pick up in all the countries. But many of them have not developed the capabilities for the same which should be attended though the SSC projects. In entrepreneurial collaborations including starting new joint or other ventures, issues of regulatory approvals can come up. In order to encourage cooperation among Southern partners it may be necessary to have more harmonisation of such regulations including quality standards among them. It is necessary for all countries to develop domestic capacity for inspection mechanisms and regulatory agencies of their own which are to be as per their national requirements (James, Mellow and Reddy, 2018).

An area where SSC can and should focus is on pharmaceutical R&D. In the past, joint biomedical research has been in the fields of tuberculosis, malaria, HIV and AIDS and biotechnology (Chaturvedi and Thorsteinsdottir, 2012). While continuing these efforts there is need for collaboration in the areas of Neglected Tropical and other Diseases. Large pharmaceutical firms from the North have little motivation to develop drugs for these diseases in view of the low paying capacity of the patients affected by the same.(James 2017.) These diseases mostly affect the South and the South itself will have to explore the solutions. Collaborative research will greatly reduce the cost. R&D and collaboration should also extend to the area of medical devices. Diagnostic tests and surgical procedures are often costly and the stated reason is the high prices of the equipments and instruments. There is need to develop low cost but quality devices in developing countries and SSC can focus on the same.

Another sector for SSC is that of Intellectual Property Rights (IPRs). Since the times of the Uruguay Round of trade negotiations leading to the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement), the countries of the South were having much cooperation in this field in international fora like World Trade Organisation (WTO), World Intellectual Property Organisation (WIPO) and World Health Organisation (WHO). It was the solidarity among them that led to the Doha Declaration on Public Health in 2001. But the trend towards including TRIPS plus rights protection, including expanding the scope of patentability and extension of patent life provisions in bilateral free trade and investment agreements flags the need for more cooperation in this area. The TRIPS Agreement has provided for adequate flexibilities for countries in the IPR laws to take care of public health requirements including ensuring affordable access to health products. However, whenever countries attempt to implement such flexibilities like Compulsory Licences there are concerted pressures on them from industrialised countries for not to do so. Coordinated and collaborative efforts by South like the recommendation in the 2nd EAC (East African Community) Regional Pharmaceutical Plan of Action 2017-2027 to use public health related TRIPS flexibilities by the member countries of EAC, can make the use of the flexibilities much easier (James *et al*. 2018). Exchange of information on the use of compulsory licences and other

flexibilities can also be part of SSC. They can collaborate in areas of law and policy. Drafting of laws has to be as per the local conditions. Not all countries in the South have local expertise in drafting IP policies and laws. Some countries like India have drafted legislations in such a way as to fulfil the obligations under the TRIPS Agreement, but providing innovative ways for preventing the ever-greening of patents. IP regimes must be in accordance with local realities. Many countries lack the capability to examine patent applications, particularly pharmaceutical patents; common IP offices with well qualified personnel and modern infrastructure can be made possible through SSC. Africa has already set up a Regional IP Office.

The health care narrative as it has developed over the years is based on a one system model, that is the allopathic system. In countries of the South like China, India, Sri Lanka, South Africa, etc., there are robust indigenous systems of medicine like Ayurveda, Chinese Medicine, etc. These indigenously grown systems can also effectively be used in providing universal health care and may be more conducive to the physiology of the people of the South than the Western system. SSC can extend to this field including R&D in them.

In short, SSC can play a significant role in the programmes of the South to achieve SDG 3. They should build on the experiences which they already had in this area and explore new opportunities. The basic principles of local ownership of the programmes and respecting national sovereignty should continue to guide them. An objective should be to develop local capacity and not merely passing on of goods and services. The cooperation has to be an outcome of shared goals and targets.

In this background, this Report examines India's development partnerships in health and the philosophy that guides that cooperation. It also looks into the programmes that it did along with African and some other developing countries.

Chapter II

India in Health Sector Partnerships

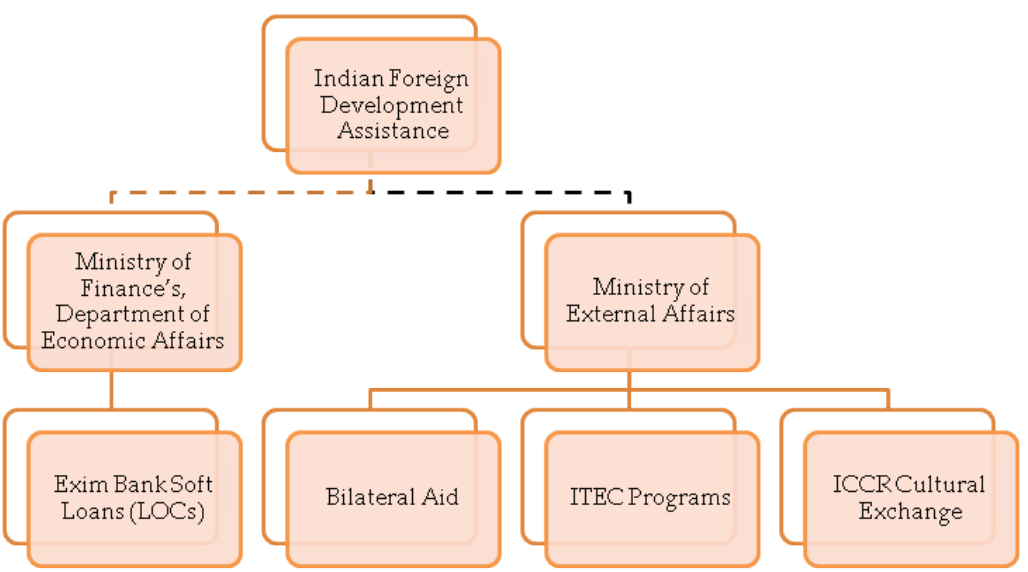
India's Health Assistance Abroad

The major turning point in Indian foreign aid policy came in 2003 when the Government of India (GoI) decided to repay its bilateral debt to all countries save four, not to accept tied aid in future and only accept bilateral aid from five countries namely, Germany, Japan, Russia, the UK, and the United States, apart from EU (Chaturvedi, 2008: 26-29). This decision essentially turned India from an aid receiver to an aid donor.

In the subsequent years the world was taken aback by the financial crisis. The crisis hit the developed countries hard. It changed the economic and political landscape of the world drastically. The change was also seen in the foreign development assistance. While the US and European countries were coping with the crisis at home, the developing countries (especially BRICS), came forward with their new projects and policies for foreign aid (Cao, *et al.*, 2018).

The Indian foreign development assistance policy decisions are mainly coordinated by two central government ministries, the Ministry of External Affairs and the Ministry of Finance's, Department of Economic Affairs (Chaturvedi, 2012a, Sridharan, 2014). The organisational flow chart of Indian development assistance by the two ministries is graphically depicted in Figure 2 below. In this Chapter we will focus on India's Health Related Foreign Assistance in the form of Lines of Credit (LoCs). Subsequent chapters will take up other forms of Development assistance, as shown in the figure.

Figure 2: Organisational Chart of India Foreign Development Assistance



Source: Authors' elaboration on the work of Sridharan, 2014.

Line of Credits

Most of the transfer of funds from India happens in the form of Lines of Credit (LoCs). LoCs can be considered disbursement of funds in the form of soft-loans passed to other countries by the Ministry of Finance's, Department of Economic Affairs. Since 2004, these funds are disbursed trough the Export-Import Bank of India (EXIM).

Sridharan, 2014 validates that these loans should be considered as Development Assistance rather than commercial activity, because these loans are subsidised by Government of India and the interest rate is lower than the market rate. As of now, the GOI has financed 244 projects of worth USD 24,189.83 million in the form of LoCs. The regional disbursement of LoCs are shown is shown in Table-1 below.

As can be seen from Table 1, Africa and Asia are two major recipients of LoCs from India. Quantity wise speaking, the majority of projects have been financed in the African region. In fact, more than 68 per cent of projects financed by EXIM bank have been in the African region alone. Although, one must note that in value terms, our major focus has been on Asia, particularly South-Asian region. Bangladesh, Nepal and Sri Lanka are the major receivers of LoCs from India.

A significant proportion of the LoCs are used in financing the development and strengthening of health care systems in recipient countries. African region has been at the forefront of receiving LoCs for heath sector related projects. Table 2 presents some of the major health care development projects financed through LoCs. Note that this list is not exhaustive. Many LoCs have been given to Multi-Sectoral projects of which, health forms a major part.

The Government of India also financed 6 projects of worth USD 141.64 million, that focussed on improving access to potable water in the regions of Sierra Leone, Cambodia, Mozambique and Niger. These projects will ultimately help in reducing the disease burden in these countries, especially the burden of cholera and other water borne diseases.

The GOI has also approved LoCs for two large scale development projects for Bangladesh. These projects amount to USD 6,500 million in total. They are to finance various social and infrastructure development projects in Bangladesh such as power, railways, road transportation, information and communication technology, shipping, health and technical education sectors. India also disbursed USD 1000 million to Nepal, after the Kathmandu earthquake in 2015 for financing rehabilitation and reconstruction of affected areas. The package comprised of 25 per cent grant and 75per cent LoC. A significant part of this amount was used for setting up portable hospitals, procurement of medicines and to cater other health specific needs of the region[8].

Table 1: Region wise Projects financed by LoCs from 2003 to January 2019

Region	Number of Projects	Amount of Credit (in USD million)
Africa	167	9319.15
Asia	48	14127.78
Latin America	24	461.52
Oceania	4	225.78
Eastern Europe	1	55.6
Total	**244**	**24189.83**

Source: EXIM bank of India.

ITEC Programmes

Another way in which India engages with developing countries in development partnerships is through short-term capacity building programmes like Indian Technical and Economic Cooperation Programme (ITEC). The ITEC programme was constituted by the decision of the Indian cabinet on 15th September 1964. Since then, the programme has attracted participation from more than 161 countries across the globe upto 2017-18. Around 68 premier institutes in India offer ITEC courses for member countries.

Table 2: Some Major LoCs in the Health Sector

S.No.	Country	Purpose	Year of Approval	Amount of Credit (in USD mn)
1	Honduras	Export of medical equipment and transportation equipment	2005-06	30.00
2	Seychelles	General Purpose and Implementation of Integrated Health Information System.	2006-07	8.00
3	Senegal	Supply of medical equipments, furniture and other accessories to four hospitals	2009-10	5.00
4	Zambia	Pre-fabricated health posts	2011-12	50.00
5	Guyana	Multi-Specialty Hospital	2011-12	4.29
6	Guinea	Strengthening of Health System	2013-14	35.00
7	Cote d'Ivoire	Upgradation of Military Hospitals	2016-17	71.40
8	Guyana	Up-gradation of three Primary Health Centre in Guyana	2017-18	17.50

Source: Authors' analysis of the EXIM bank Lines of Credit Statistics.

The ITEC programme consists of the following components[9]:-

- Training (civilian and defence) in India of nominees from ITEC partner countries;
- Projects and project related activities such as feasibility studies and consultancy services;
- Deputation of Indian experts abroad;
- Study Tours;
- Gifts/Donations of equipment at the request of ITEC partner countries; and
- Aid for Disaster Relief

In 2017-18 alone, 10,918 scholarships were offered under the ITEC training programmes to 161 partner countries. More than 68 premier institutions across India run 309 short-term and medium term courses in various disciplines including health and traditional medicine[10]. These courses are meant for working professionals nominated by the partner countries.

Health and Yoga are major streams offered by ITEC programmes in India. Some premier institutes offering scholarship on health related courses include Centre for Development of Advanced Computing, Mohali; Indian Institute of Public Administration; Indian Institute of Technology, Delhi; Sports Authority of India, Thiruvananthapuram; and Swami Vivekananda Yoga Anusandhana Samsthana, Bengaluru. Health related ITEC programmes include specialized training in healthcare technologies (Bio-medical Equipment and Medical informatics), training in healthcare technology management and clinical equipment, public administration of health care sectors, training in Telemedicine, medical informatics, and healthcare information technology, and training programme in management on operation, repair servicing and maintenance of cardiac imaging and nuclear medicine equipment. Specialized training programmes were also organised for Yoga trainers for several countries including Senegal, Gambia, Cape Verde, Guinea Bissau, etc.

Indian Council for Cultural Relations

Another prominent Indian policy for fostering foreign development partnership is the Indian Council for Cultural Relations (ICCR). Initiated in 1950 by Maulana Abdul Kalam Azad, the first education minister of independent India, ICCR aims at strengthening cultural exchange and knowledge sharing with other countries and people.

The constitution of ICCR defines the

objectives of this policy as the following[11]:-

- To participate in the formulation and implementation of policies and programmes relating to India's external cultural relations;
- To foster and strengthen cultural relations and mutual understanding between India and other countries;
- To promote cultural exchange with other countries and peoples;
- To establish and develop relations with national and inter-national organizations in the field of culture;
- To take such measures as may be required to further these objectives.

Under ICCR the GOI offers various scholarships for the students of member countries. Special scholarships are open for citizens of Bangladesh, Sri Lanka, Nepal, Maldives and African Nations. Although, the scholarship does not include MBBS, BDS, and other courses in western medicine courses, ICCR provides scholarships to students seeking training in Indian Traditional Medicine. Under AYUSH scholarship scheme, 50 scholarships are provided to citizens of BIMSTEC and Non-BIMSTEC member countries. Courses in Indian traditional medical system such as Ayurveda, Unani, Siddha and Homeopathy are covered in this scholarship.

Research and Information System for Developing Countries

RIS, a New Delhi-based, autonomous policy research institute that specialises in issues related to international economic development, trade, investment and technology, owes its origin to South-South Cooperation. It was President Julius Nyerere of Tanzania who initially suggested the necessity to have deeper intellectual cooperation among the developing countries and also the need for a southern think tank on the lines of OECD institutions to provide policy inputs to the Non-aligned and Other Developing Countries. This suggestions was later considered in the Summit meetings of the Non-Aligned and Other Developing Countries and finally, working on this suggestion, India set up the RIS in the year 1983.

Visit to Parliament of India by 30 participants from 20 countries, ITEC programme on International Economic Issues and Development Policy (IEIDP), 2019.

From its inception, it has focussed on issues, *inter alia,* relating to public health policies and how the same affect development. The institute also initiated a number of cooperation programmes with institutions in other developing countries, apart from carrying out studies in the Southern countries.

RIS introduced ITEC programmes in 2001. At present it offers ITEC programmes in the following five majors:

- International Economic Issues and Development Policy (IEIDP)
- Learning South-South Cooperation
- Science Diplomacy
- Trade and Sustainability
- Sustainable Development Goals

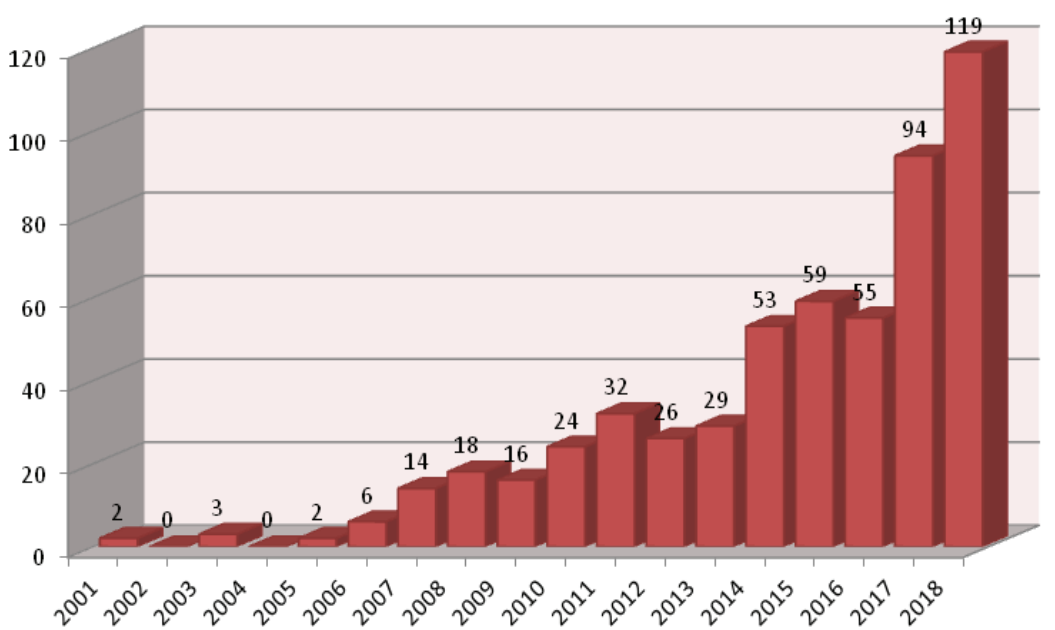
In all these programmes, public health policy and Intellectual Property Rights forms an integral part of the comprehensive course structure.

Over the years, the programme has grown, both in popularity as well as participation. Figure 3 below shows the year wise number of participants in the ITEC programme from 2001 to 2018. Starting with just 2 participants in 2001 the ITEC programmes at RIS attracted participation of 119 people from various developing countries in 2018. From 2018 till February 2019 a total of 146 participants from 63 countries have been enrolled in the ITEC programmes offered by RIS.

Bilateral Assistance

The Ministry of External Affairs, Government of India gives Grant-in-Aid to developing countries. The major focus of India's bilateral assistance is on neighbouring countries, although grants to African and Latin American countries also form significant part. Table-3 gives the distribution of aid disbursed by Ministry of External Affairs for the years 2015-16 and 2017-18. It shows clearly that while majority of our bilateral financial assistance goes to our South-Asian neighbours, Bhutan being the major recipient of Bilateral Assistance from India. Africa as a whole, received 2.36 per cent of the total aid in 2015-16 and 4.49 per cent in 2017-18. This is because India's development partnership with Africa has been mainly through the channel of LoCs in which more than 68 per cent of the

Figure 3: Number of students participating in the ITEC programmes conducted at RIS, 2001-2018



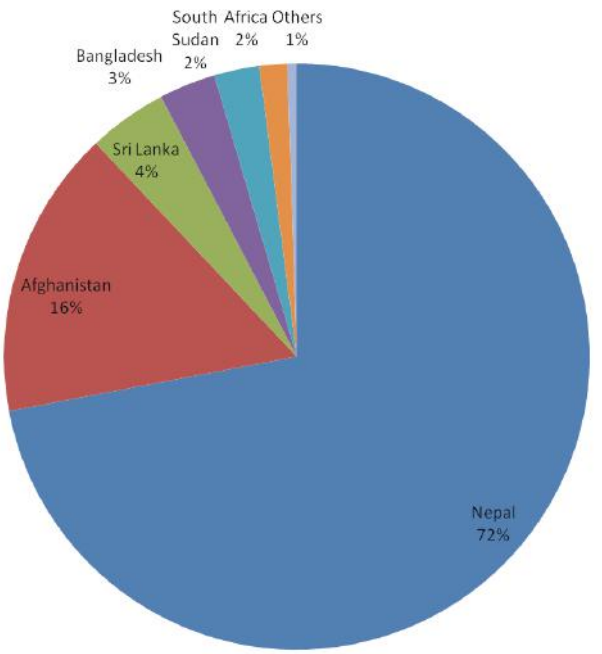
Source: Research and Information system for Developing Countries.

Table 3: Major Beneficiaries of India's Bilateral Foreign Assistance

Country	2015-16		2017-18	
	Allocation (Rs. In Crore)	% of Total Aid Budget	Allocation (Rs. In Crore)	% of Total Aid Budget
Bhutan	5612.69	66.47	3,714.13	53.87
Bangladesh	213.79	2.53	125.00	1.81
Afghanistan	682.94	8.09	350.00	5.08
Sri Lanka	500	5.92	125.00	1.81
Nepal	300	3.55	375.00	5.44
Myanmar	154	1.82	225.00	3.26
Africa	200	2.37	330.00	4.79
Eurasia	20	0.24	25.00	0.36
Maldives	213	2.52	245.00	3.55
Latin America	15	0.18	20.00	0.29
Mongolia	7.5	0.09	5.00	0.07
Others	524.57	6.21	1354.90	19.65
Total	**8443.49**	**100.00**	**6894.03**	**100**

Source: Ministry of External Affairs Outcome Budget, 2016-17 & Annual Report 2017-18.

Figure 4: Foreign Assistance in Health Sector during 2016-17



Source: Authors' analysis of Ministry of External Affairs, Outcome Budget, 2016-17.

total projects financed through that channel has been in Africa region.

The same pattern follows in financial assistance for healthcare sector too. An analysis of budget data of Ministry of External Affairs (MEA) reveals that financial assistance in health sector comprised 5.27 per cent of the budget expenditure on foreign assistance. In the year 2016-17, Nepal received the largest share of health sector assistance (72 per cent). Every year, on Republic Day and Independence Day, India gifts 40 ambulances and school buses to the healthcare and educational institutions of Nepal. After Nepal, Afghanistan (16 per cent) received the second highest amount of health sector assistance from India, followed by Sri Lanka (4 per cent), Bangladesh (3 per cent) (see Figure 4).

Chapter III

India-Africa Development Cooperation in Health Care

Prologue

The decades immediately following the end of Second World War, saw major political changes in Africa and Asia with countries gaining independence from colonial regimes and establishing nation states. Most of the newly independent countries opted for a socialist pattern of society and economy. However, from the 1990s, there have been major changes in the economic policies in that the countries shifted from high reliance on public sector for bringing improvements in economy towards economic liberalism encouraging private entrepreneurships. The development cooperation approaches also changed accordingly from fully state funded projects to state facilitated cooperation programmes involving private players. India-Africa inter-actions have also moved beyond those based merely on 'ideas and services' to a more pragmatic relationship that involves economic and political and even security interests and developmental needs of both sides.

The rapid growth of the economies of China and India since the introduction of the liberalization policies in these countries in the 1980s and 1990s respectively, has also influenced the development cooperation programmes with Africa. They are also now major partners with Africa in such activities along with the traditional donors of the Organisation for Economic Cooperation and Development (OECD). Besides economic shifts, there have also been demographic changes in the world with populations in Europe and North America aging and needing infusion of younger blood from the developing countries in Asia, Africa and South America to run those economies.

It is interesting to reflect on how these new developments have translated into certain strategic interests that are shaping Indian development cooperation policy towards Africa. On the one hand, Africa has emerged as an important market for Indian goods and services and, on the other hand, as a vital element in India's quest for energy security. Africa has large land and mineral resources with vast tracts of unutilised arable land. India has large, well educated population who looks forward to gainful economic and service activities. The substantial growth of Indian service sector also places it in a position to have mutually beneficial development cooperation activities with Africa which has less population but in need of large service sector.

In the decades following India's independence, the principle of South–South Cooperation (SSC), particularly in the context of the non-aligned movement, has been at the forefront of India's foreign policy towards Africa. Now, India and Africa are prepared more than ever to re-establish economic and political relationships to promote their mutual interests. Furthermore, India's recent experience

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• Part III is an updated and expanded version of the earlier 2015 publication 'India-Africa Partnership in Health Care: Accomplishments and Prospects'.

in reducing its aid dependency while moving in the direction of becoming one of the leading emerging economies in the world has played a central role in its foreign policy towards Africa. The government of India attaches great importance to economic relations as the basis of renewed India–Africa engagement (Sinha, 2010).[12]

In this part of the study, our focus is on India -Africa development cooperation in the health sector including in drugs and pharmaceutical products which yields social and economic dividends. While, taking measures to improve its own health care system, enhancement of health care in Africa has been one of the goals of India's development cooperation with African countries.

Since the 1990s, there have also been major national and international efforts and programmes to improve the health status of populations in developing and least developed countries. Africa now with about 17.18 per cent and India with approximately 17.74 per cent of the world population[13] are two major focus areas of such programmes as general improvement in public health in these two regions will bring in major rewards in global productivity. The focussed efforts towards achievement of the Millennium Development Goals (MDGs)[14] of which health related goals formed important areas, have yielded significant results in both Africa and India. As presented in the following sections, the Infant Mortality Rates (IMRs), Maternal Mortality Rates (MMRs) and incidence of deaths due to HIV/AIDS, Malaria and Tuberculosis have reduced considerably in both the regions. The noteworthy success of the MDGs have prompted the world community to set new targets in health and other social indicators to be achieved by 2030 in the form of Sustainable Development Goals (SDGs).[15] Although, one Goal only is specifically on health, many other goals have serious implications for health sector.

India, however, along with committing itself to the SDGs, has set its own agenda in health care. It has announced "the attainment of the highest possible level of good health and well-being, through a preventive and promotive health care orientation in all developmental policies, and universal access to good quality health care services without any one having to face financial hardship as a consequence" as its goal in the Draft National Health Policy 2015.[16] The key policy principles for achieving this goal are equity, universality, patient-centred quality care, inclusive partnerships, pluralism, subsidiarity, accountability, professionalism, integrity & ethics, continuous adaptation and affordability. Some of the major programmes envisaged are for reduction of maternal mortality, achievement of single digit neonatal mortality and stillbirth rates through a careful community based intervention, universal immunisation, population stabilization, women's health and gender mainstreaming, integrated disease surveillance programme, control of tuberculosis, HIV/AIDS, leprosy elimination, vector borne disease control, effective prevention and therapy of non-communicable diseases, better mental care, and disaster preparedness. Realising the potential of Indian traditional systems of medicine in health care integration of those systems with general health care is also one of the major programmes.[17]

At the same time, Africa has also, after much internal discussion set its health agenda referred to as Agenda 2063.[18] Healthy and well nourished citizens with long life spans are one of the goals of this agenda. It clearly lays down that by 2063, "every citizen will have full access to affordable and quality health care services" and

- *Africa would have rid itself of all the neglected tropical diseases; put in place systems for significantly reduced non-communicable and lifestyle changes related diseases and reduced to zero deaths from HIV/AIDSW, Malaria and Tuberculosis.*
- *The African population will be a healthy and well nourished, enjoying a life expectancy of above 75 years.*
- *All barriers to access to quality health for women and girls would be non-existent.*

The Indian and African health agenda are reflective of the importance that the parties are giving to achievement of universal health care in the most feasible time frame. These new goals have to be taken into consideration in

the formulation of development cooperation activities in the coming decades.

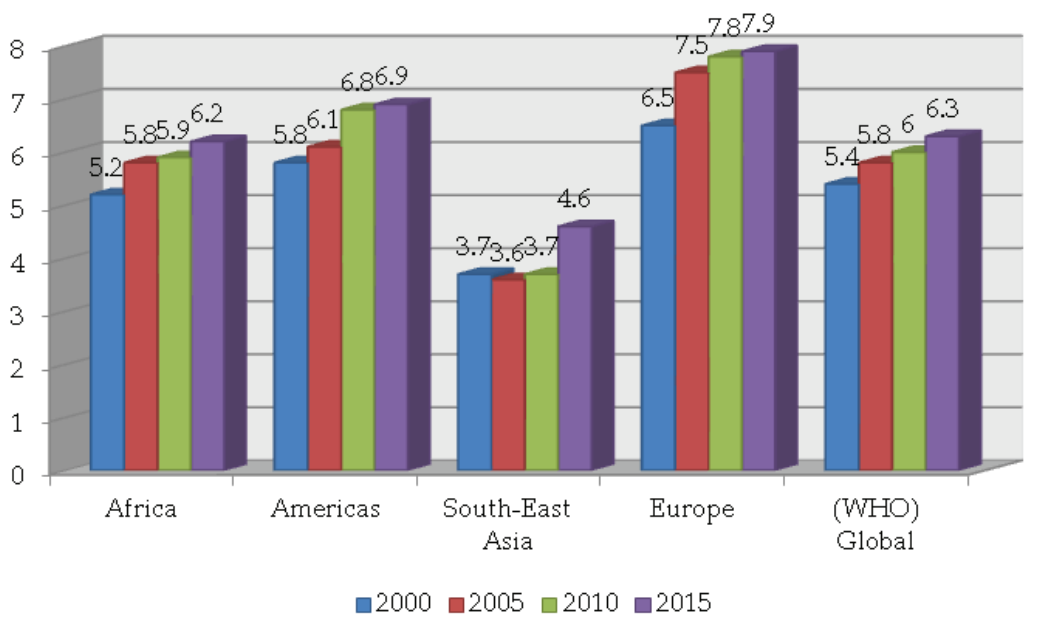
Status of Health Sector in Africa

As per an International Finance Corporation (World Bank Group) study (2007) Africa consisting of 11 per cent of world population, had a share of 24 per cent in the disease burden (See Figure 6 and Figure 7 for a comparison of distribution of incidence and mortality for common communicable diseases in Africa and the World). As per DALYs rate from all countries in 2016, in sub-Saharan Africa the rates vary from 40,000 to 70,000 DALYs per 100,000 persons accounting for more than 20 per cent of global figures.[19] As shown in Figure 6, Africa faces major challenges in the health sector particularly in the form of health workforce including shortage of doctors, nurses, pathologists and all classes of healthcare professional. The density of skilled health professional in Africa in 2017 stood at just 14.1 per 10 000 population compared to the global average of 45.6. Africa's average expenditure on health was 5.2 per cent of GDP in 2000 which improved to 6.2 per cent of GDP in 2015, but considering the disease burden and low GDP is insufficient to tackle the health care needs (See Figure 5).

In 2015, Liberia, Sierra Leone, and South Sudan were spending more than 10 per cent of their GDP on health sector, which is greater than the world average of 9.90. As per data for that year, South Sudan, Gabon, Equatorial Guinea, Angola, Eritrea, Seychelles, Congo, Nigeria, Senegal, and Benin are the countries who are spending less than 4 per cent of their GDP on public Health Expenditures. Out of 54 countries, 41 are having higher out-of-pocket health expenditure than the remaining world in 2015, while data for two countries, Libya and Somalia is not available. Population of the seven countries, namely, South Sudan, Egypt, Sudan, Cameroon, Equatorial Guinea, Nigeria, and Comoros met more than 60 per cent of their health expenditure from their own pockets, in 2015. (More details are provided in Table A1 in the annexure).

As shown in Table 4, Africa faces major challenges in the health sector particularly in the form of health workforce including shortage of

Figure 5: Current health expenditure (CHE) as percentage GDP



Source: Global Health Observatory, World Health Organisation.

Table 4: Status of Health Workforce, Health Infrastructure and Technology in Africa and World

Parameter	Indicator	Year	Africa*	World
Density of Health Workforce (per 10,000 population)	Physicians	2007-13	2.7	13.9
	Nursing& Midwifery Personnel		12.4	28.6
	Density Personnel		0.5	2.8
	Pharmaceutical Personnel		0.8	4.5
	Psychiatrists	2014	<0.05	0.2
Density of Health Infrastructure and Technologies	Hospitals	2013	0.8	
	Psychiatric Beds	2014	3.4	22.9
	Computed Tomography	2013	0.4	
	Radiotherapy	2013	0.1	1.8
	Mammography	2013	7.4	

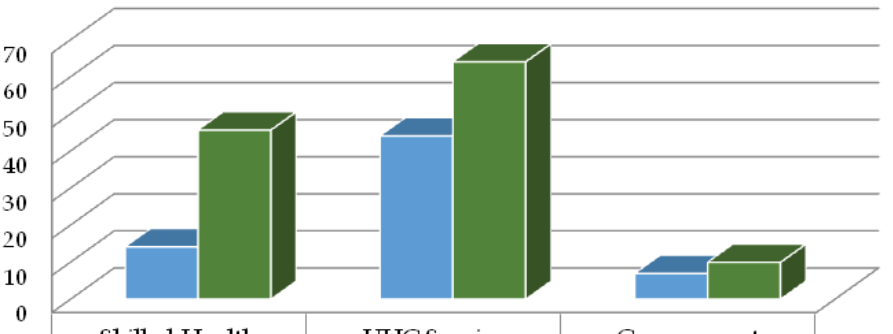
*Since data for all 54 countries are not available, WHO African Region has been taken which excludes Djibouti, Egypt, Libya, Morocco, Somalia, Sudan and Tunisia.
Source: World Health Statistics 2015.

doctors, nurses, pathologists and all classes of healthcare professional. For the period of 2007-13, density of physician and nursing personnel was 2.7 and 12.4 respectively, which is quite low compared to the world. Also, there is a huge shortage of all forms of healthcare infrastructure. The density of psychiatric beds stood at 3.4 in 2014 which is very low as compared to 22.9 globally. The indicators are taken from World Health Statistics 2015. From 2015 onwards, it seems that monitoring of World Health Statistics reports have been shifted from health infrastructure density towards SDG 3 related indicators. Therefore, we do not have ready data on the density of hospitals, psychiatric beds, radio therapy etc, after 2015, although, we did a comparison of SDG related indicators of universal health coverage, MMR, incidence of communicable diseases, etc., as shown in the following figures and tables. These indicators are taken from more recent version of World Health Statistics reports.

The effect of dismal levels of public health care spending, low density of skilled health professionals and high out of pocket spending on health care can be readily seen on the most accepted health indicators of the population, such as life expectancy at birth in years, Maternal Mortality Ratio and Under-5 Mortality Ratio. A simple comparison of Figures 6 and 7 shows us that poor quality of health care infrastructure in Africa also translates into poor performance of African region in terms of health of the population.

Figure 6 show that the density of skilled health professionals in Africa is less than one third of the global average. In turn it also performs poorly in Universal Health Coverage, a major pillar of SDG 3 goal of Health and Wellness for all. It is necessary to take these statistics with utmost seriousness, because they affect the daily lives of people living in the region. Consider Figure 7 for example. The figure points towards the gap in general indicators of health of the population living in Africa and India with respect to the global averages. India has been able to significantly fill these gaps in most of the indicators. In some cases, like in the case of Maternal Mortality rates, India has even surpassed the global averages. Things are quite different when it comes to Africa. Significant gaps still remain in all major indicators of health, like life expectancy, Maternal and Child Mortality.

Figure 6: Status of Health Sector in Africa and the world



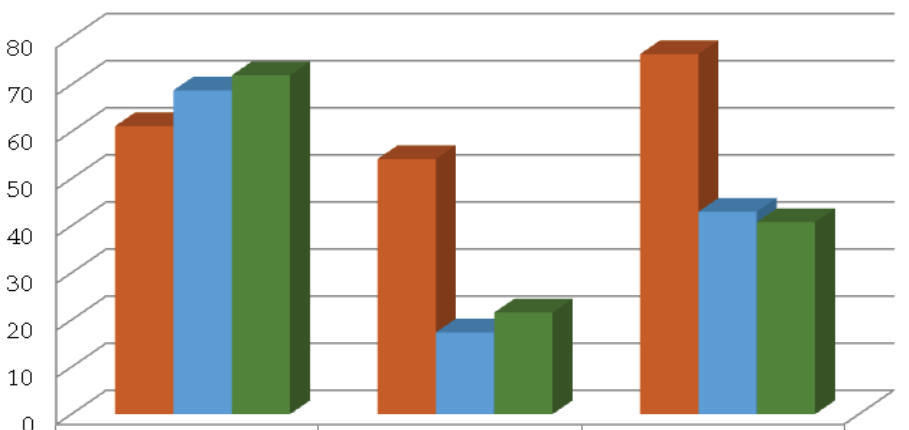
	Skilled Health Professional Density (Per 10000 Population)	UHC Service Coverage Index	Government Expenditure on Health (% of total government Expenditure)
Africa	14.1	44	6.9
World	45.6	64	9.9

Source: World Health Statistics 2017 & 2018.

Several studies have claimed that low per capita spending on health also has severe effect on child health of the region (Wagstaff, 2003; Shetty & Shetty, 2014). A simple comparison of per capita health care expenditure and indicators of child health in the African region with the global estimates (As shown in Table 5) supports the above mentioned studies.

As stated above, Africa consist of 11 per cent of global population but has a share of 24 per cent global disease burden. Figure 8 and figure 9 show that the burden of communicable diseases is very

Figure 7: General Indicators of Health of Population in India, African Region and the World



	Life expectancy at birth (years)	Maternal mortality ratio (per 10 000)*	Under-five mortality rate (per 1000)
African Region	61.2	54.2	76.5
India	68.8	17.4	43
Global	72	21.6	40.8

*Maternal Mortality ratio figure deflated to Per 10,000 population to match the scale
Source: World Health Statistics 2018.

Table 5: Health Expenditure and indicators for child health in Africa and the World

Indicator	African Region	Global
Current health expenditure (CHE) per capita d (US$)	115	822
Prevalence of stunting in children under 5 (%)	33.6	22.2
Prevalence of wasting in children under 5 (%)	7.0	7.5
Prevalence of overweight in children under 5 (%)	3.7	5.6

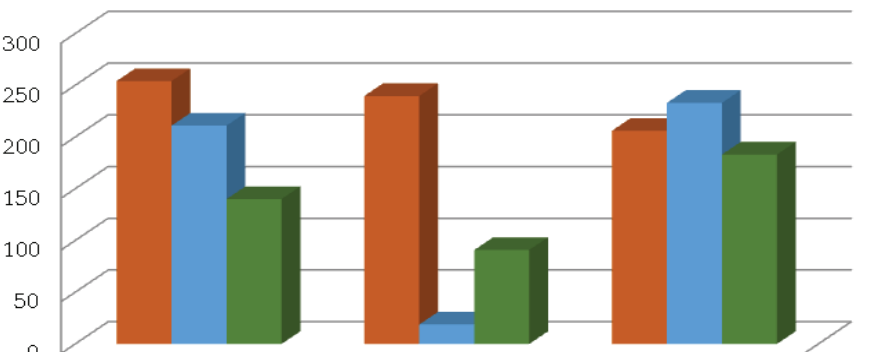
Source: World Health Statistics, 2018.

high in the African region, when compared to India and the world. Annexure table A4 gives a detailed distribution of mortality in Africa and the world in 2016. The data shows that out of 11,444 recorded deaths attributed to communicable, maternal, pre-natal and nutritional conditions, 4,952 deaths (around 44 per cent of the total) happened in the African region.

High incidence of communicable diseases in Africa shifts the burden of communicable disease mortality, disproportionately towards the African Region. Figure 9 shows graphical representation of disease mortality HIV, Malaria and Tuberculosis. Out of the total 1.29 million deaths in the world due to tuberculosis, 405 thousand (31.25 per cent) occurred in the African region. Similarly, out of the total 1.01 million deaths in the world in 2016, reported due to HIV/AIDS, 719 thousand (71.04 per cent) deaths happened in the African region. The worst statistics are of mortality due to Malaria, in which Africa alone accounted for more than 91 per cent of total deaths that were reported due to Malaria in 2016. It is clearly indicative from the figures that African region bears a higher proportion of communicable disease mortality, than Africa's share in the global population.

One must note that these statistics are produced on the basis of deaths that reported alongside with their reasons. The magnitude of the problem further intensifies when one takes into account the fact that being a relatively poorer region, the share of reporting of mortality in Africa is much less when compared to the rest of the world. Therefore, what we see in these statistics might just be tip of the ice berg.

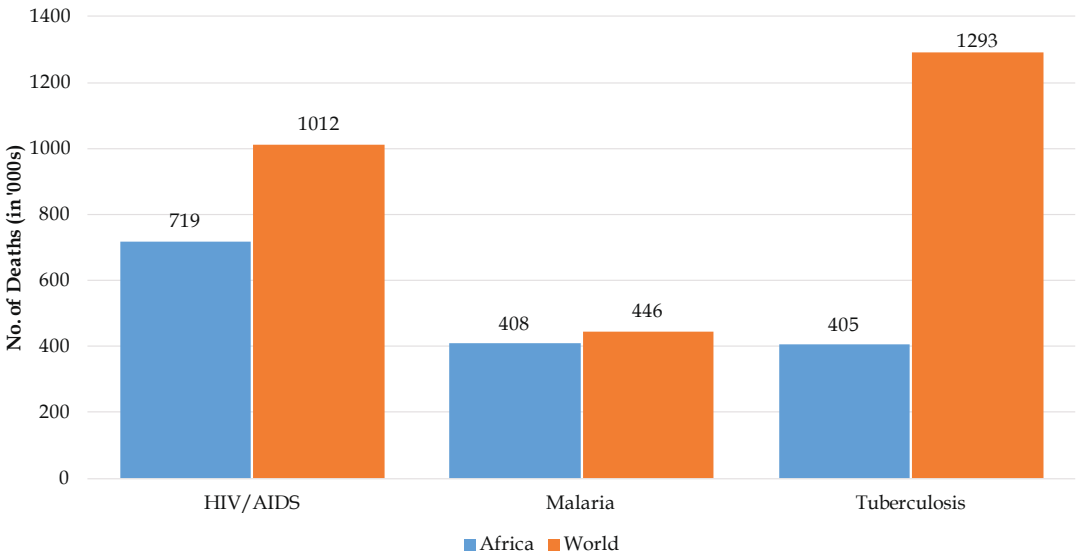
Figure 8: Disease Burden in Africa, India and the World



	Tuberculosis incidence (per 100 000 population)	Malaria incidence (per 1000 population at risk)	Probability of dying from selected NCDs between age 30-70 (Per 1000 Population)*
African Region	254	239.6	206.00
India	211	18.8	233.00
Global	140	90.8	183.00

*Selected NCDs include CVD, cancer, diabetes & CRD, figure inflated to per 1000 to match scale
Source: World Health Statistics, 2018.

Figure 9: Disease Mortality in Africa and the world

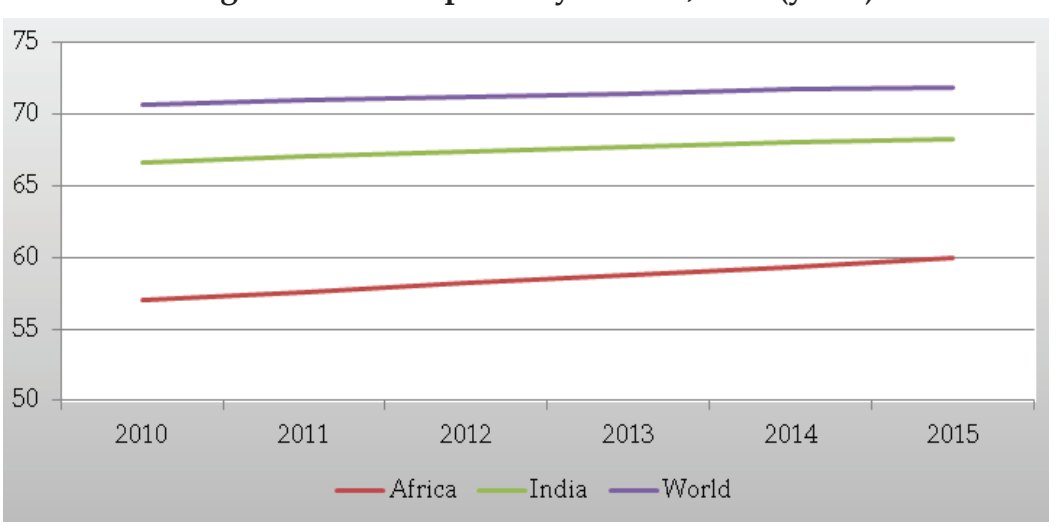


Source: Global Health Estimates 2016, World Health Organisation.

Life Expectancy

Figure 10 depicts the life expectancy at birth in Africa, India and world. For a child born in the African region, healthy life expectancy was 60 in 2015 which is very low compared to the world which is at 72. Africa is expected to have a life expectancy of 70 years by 2060. Sierra Leone, Central African Republic, Chad, Nigeria and Cote d'Ivoire have the lowest life expectancy in Africa in 2015. Egypt, Libya, Cape Verde, Seychelles, Mauritius, Tunisia, Morocco, and Algeria have a higher life expectancy than India (Country-wise analysis is given in Table A2 of the Annexure). Figure 10 shows the trend in life expectancy in Africa, India and World. The figure indicates that Africa is slowly, but steadily narrowing the gaps in the life expectancy when compared with global levels as well as Indian estimates.

Figure 10: Life Expectancy at birth, total (years)



Source: WDI Database.

Maternal Mortality

As per the statistics available from global health observatory database, the Maternal Mortality Rate (MMR) per 100,000 live births was 926 Eastern and Southern Africa, and 1,070 in West and Central Africa in 1990. Middle East and North Africa showed a significantly better rate of maternal mortality at just 221. The number for whole African region was 965. In the period of 25 years, by 2015, the two rogue regions of Eastern and Southern Africa, and Western and Central Africa were able to bring down their MMR levels to 417 and 679, respectively. The current MMR rate of African region came down to 542. Notwithstanding the progress that has been made, there is still a long way to go considering the global MMR level is at 210, and that of India is at 170.

According to the latest data available, top 27 countries with the highest maternal mortality ratio in 2015 were all African nations, 28th being Afghanistan. The highest maternal mortality rate was in Central African Republic which stood at an alarming rate of 882. For a detailed country wise data on MMR in Africa Table A2 of the annexure may be seen.

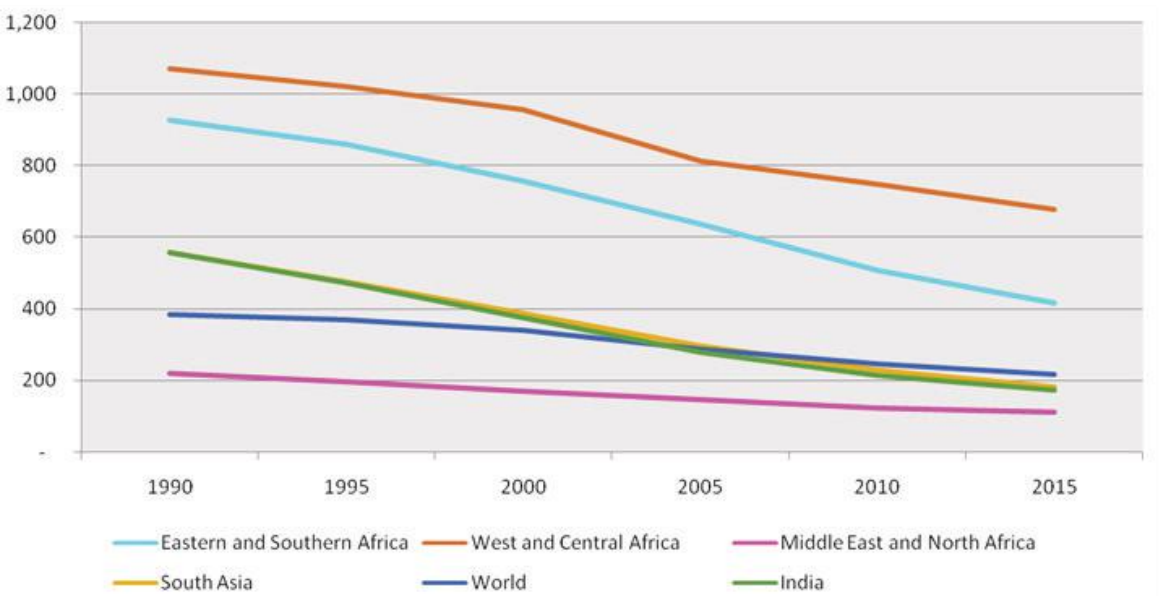
Infant Mortality Rate (IMR)

Central African Republic, Sierra Leone, Somalia, Chad, Congo, Lesotho, Mali, Equatorial Guinea, Nigeria, Cote d'Ivoire, Benin, South Sudan, Guinea, Liberia, Guinea-Bissau, Cameroon, and Angola have a very high infant mortality rate ranging from 87.6 to 53.8 per 1000 live births in 2014. Libya, Seychelles, Mauritius, Tunisia, Egypt, Cape Verde, Algeria, Morocco, Rwanda and South Africa have a better infant mortality rate than the world in 2015 (for more details see Table A2 in Annexure). The trend in IMR for the whole African region is shown in Figure 12.

Neonatal Mortality Rate (NMR)

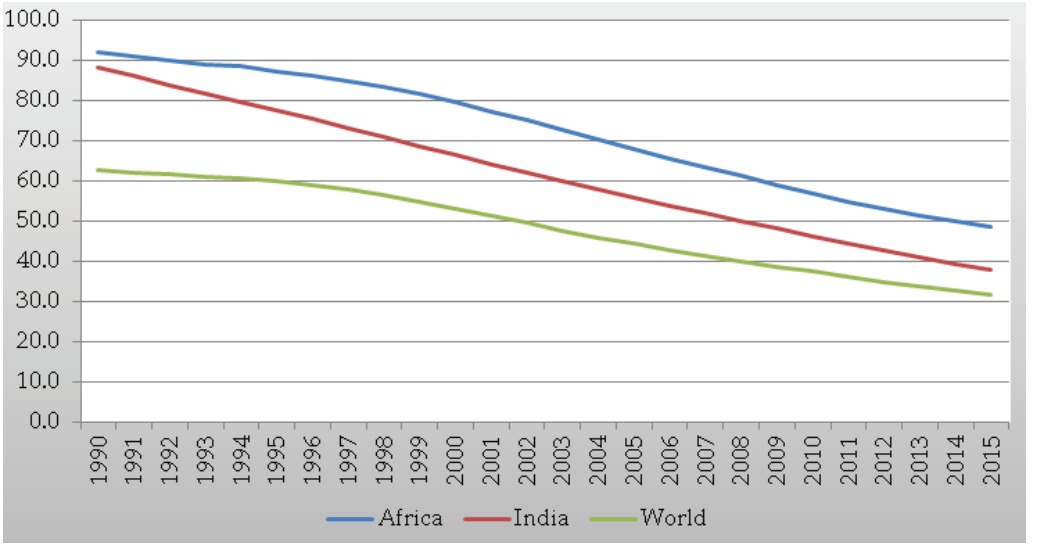
Africa has the highest neonatal death rate which is very evident from the UNICEF Global statistics. As per the statistics for the year 2017, of all the global UNICEF regions, West and Central

Figure 11: Maternal mortality ratio (per 100,000 live births)



Source: World Health Organization, UNICEF, United Nations Population Fund and The World Bank, *Trends in Maternal Mortality: 1990 to 2015,* WHO, Geneva, 2015.

Figure 12: Infant Mortality Rate (per 1,000 live births)



Source: WDI Database.

Africa has the highest NMR of 30.2, followed by Sub-Saharan Africa at 27.2. As was the case with MMR, the Middle East and North African region showed impressive number for NMR too, at 12.6. The global average for year 2017 stood at 18 per 1000 live birth.

Disease Threats

Major diseases that hamper the lives of African people are on the one hand communicable disease like HIV/AIDS, Malaria, Tuberculosis, Ebola and on the other hand Non-communicable ones such as hypertension, stoke, heart failure, chronic respiratory diseases, cancer, etc. Apart from communicable and non communicable diseases there are some neglected tropical diseases (NTD)[20] such as guinea-worm, Bureli ulcer and human African trypanosomiasis which are found mainly on the African continent. All 47 countries of WHO Africa region are endemic for at least one NTD and 36 of them are co-endemic for at least five of these diseases.

Though progress towards eradication has been impressive, HIV/AIDs, Malaria and Tuberculosis continue to be major scourge in Africa. Deaths linked to malaria and HIV/AIDS have fallen by 33 per cent and 30 per cent respectively since 2000-2004 with TB deaths declining more than a third since 1990. Diabetes cases as of now are 12.1 million (with possibility of many undiagnosed cases) and expected to rise to 24 million by 2030.

Considering the gigantic difficulties confronting African people in their health care systems, several major reforms will be needed continent-wide to ensure their viability in the long term, shifting the focus of healthcare delivery from curing to preventive care and keeping people healthy. To achieve these targets and goals Africa has set their Agenda 2063 which ensure every citizen would have full access to affordable and quality health care services. This can be achieved by giving local communities more control over health care resources, improving access to healthcare via mobile technologies, tightening controls over medicines, medical devices, and improving their distribution, reducing reliance on international aid organisations to foster development of more dependable local supplies and extending universal health insurance coverage to the poorest Africans. Technology such as telemedicine and related mobile-phone technology becomes the dominant means of

delivering health care advice and treatment in future.

Most Infectious Communicable Diseases in Africa

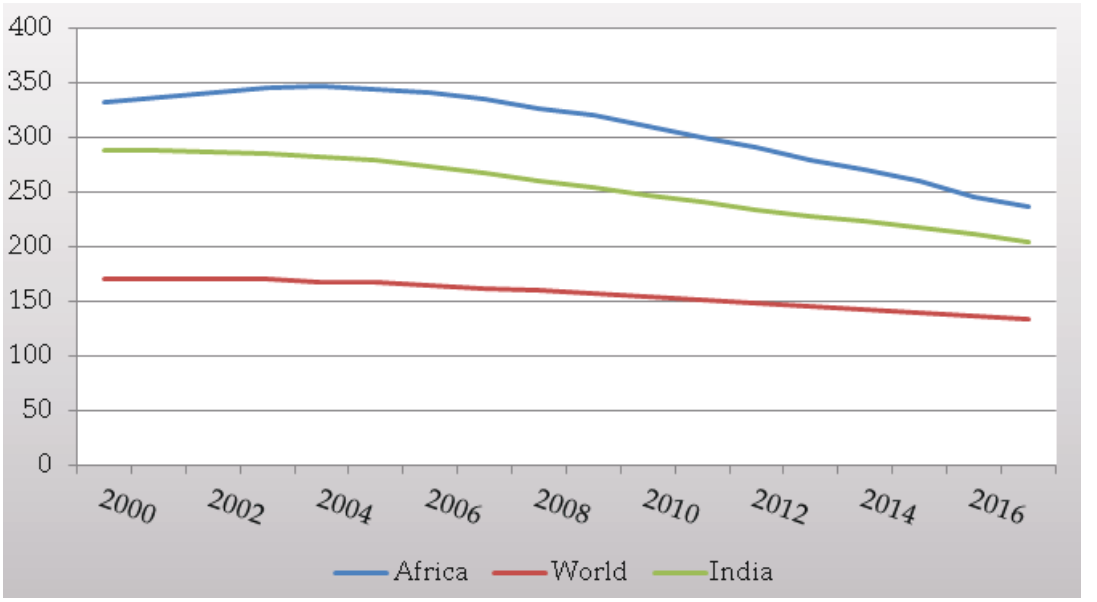
HIV/ AIDS

Almost more than 70 per cent of the African people were affected by HIV/AIDS in 2012, but there are empowering signs that the HIV/ AIDS scourge is backing off. HIV prevalence rates are much higher in women than men, with the largest differences being seen in the age group 15–24 years. Prevalence tends to be higher in urban than in rural areas, although this difference is less in southern Africa. HIV is still spreading in the region with 1.6 million new infections reported in 2012, young people aged 15-24 years accounted for almost half (42 per cent) of new infections reported worldwide and almost 80 per cent of these were living in Sub Saharan Africa. Since 2001, population living with HIV has risen by 12 per cent in the region. Until recently, Ghana had a high level of mother-to-child HIV transmission. In 2010, the country committed to scaling up prevention of mother-to-child transmission (PMTCT), setting its goal as "to ensure a generation free of AIDS and to eliminate mother-to-child transmission of HIV by 2015". Possible improvements depend on the usage of standardised and simplified treatment protocols and decentralised service delivery models to deliver treatment to large number of HIV positive adults and children. The uptake of antiretroviral therapy (ART) has also improved substantially, with 63 per cent of pregnant women living with HIV receiving ART in 2012 compared with 34 per cent in 2009. This has led to a decline of 37 per cent in new HIV infections among children between 2009 and 2012.[21]

Tuberculosis

Tuberculosis is a major problem worldwide with 1.3 million new cases recorded in 2012, of which 27 per cent occurred in the African Region. Although the prevalence of tuberculosis was high in 2017 (237 per 100,000 population), there is significant improvement over since 1990 when it was 404 per 100,000. The number of people with multidrug-resistant tuberculosis being treated has

Figure 13: Trend of Tuberculosis in Africa, India & World from 1990 to 2016



Source: Global Health Observatory, World Health Organisation.

increased five-fold since 2008; only about 57 per cent of people with this type of tuberculosis were receiving treatment at the end of 2012. Measures to control intervention of TB are expansion of the basic package that underpins the Stop TB Strategy of Directly Observed Treatment Short-Course (DOTS), resulting in an increased number of countries achieving tuberculosis treatment success rates of 85 per cent, implementation of WHO paediatric tuberculosis guidelines, leading to improved detection and notification of all forms of tuberculosis in children, improved diagnostics, resulting improved case detection, and detection and treatment of multidrug-resistant and extensively drug-resistant tuberculosis.[22]

Malaria

Malaria remains a major global health problem and the WHO African Region is one of the severely affected regions in the world. In 2012, there was an estimated 207 million cases of malaria worldwide, 80 per cent of them in the African region. The malaria mortality rate has decreased by over 50 per cent in children in the past 12 years. This reduction is projected to reach 68 per cent by 2015, due to improved availability and use of insecticide-treated nets, diagnosis-based treatment with artemisinin-based combination therapy, engagement of communities in malaria control, and strengthening capacity in vector control for malaria.[23] (For country-wise statistics on HIV, Tuberculosis and Malaria Table A3 in Annexure may be seen.)

Ebola Virus

Ebola virus is raging through western Africa, causing the most severe, complex and devastating outbreak seen in the four decades since this virus emerged first in 1976 in Yambuku, a village along the River Ebola in the Democratic Republic of Congo. The destruction it has wreaked can be measured not only in the mounting toll of human lives lost, but in economies stalled and communities paralysed by fear and panic. Progress made by countries in strengthening their national public health laboratories capacities and the networking of laboratories at regional level have led to early detection of emerging dangerous pathogens, such as Ebola and Marburg viruses, and enabled a better, more effective response. There has been a significant progressive decrease in the number of cases and deaths recorded during Ebola virus disease outbreaks over the past 30 years.

The importance of early detection was underscored by the ongoing epidemic of Ebola virus disease in Guinea, Liberia and Sierra Leone. In March 2014, Guinea notified WHO about cases of Ebola virus disease. The cases were initially confined to rural Guinea with the epicentre being Gueckedou. What started as a rural outbreak has spread to Conakry, the capital of Guinea, as well as across the borders into Liberia and Sierra Leone. The current Ebola virus disease outbreak has surpassed all other outbreaks in terms of cases, deaths and geographic spread across Guinea, Liberia and Sierra Leone. As of 19 October 2014, the cumulative number of cases attributed to Ebola virus disease in the three countries stands at 9,936, including 4,877 deaths.[24]

Non-Communicable Diseases

The Region has not escaped the global epidemic of Nn-Communicable Diseases (NCDs). WHO estimates that deaths from NCD are likely to increase globally by 17 per cent over the next 10 years. African region will experience a 27 per cent increase that is 28 million additional deaths from these conditions, which are projected to exceed deaths due to communicable, maternal, prenatal, and nutritional diseases combined by 2030. Current statistics for communicable disease is given in the Table A3 in Annexure. Table A4 gives the distribution of mortality attributed to specific causes, such as NCDs, communicable diseases, etc.

Presently NCDs account for 34.2 percent of total deaths in Africa. The number does not seem to be a major threat when compared to 71.3 per cent attributed to NCDs globally. But the risk of NCDs in Africa is projected to increase. The four

main risk factors for major NCDS are usage of tobacco, physical inactivity, intake of excessive alcohol and unhealthy diet. Cardiovascular diseases such as hypertension, stoke, heart failure and diseases of the coronary artery are increasing in African region and have become a major public health problem. World's highest prevalence of hypertension (38.1 per cent among males, 35.5 per cent among females) with some countries (e.g. Cape Verde, Mozambique, Niger, Sao Tome and Principe) reporting prevalence rates of 50 per cent or higher. Asthma prevalence is rising in Africa possibly due to increased urbanization and air pollution-23 per cent has been reported in urban South Africa. Cancer is one of the severe NCDs which has affected the African region. Most common cancers among women are breast, cervical, stomach, lung, and colorectal cancers. Breast cancer incidence rates show marked inequalities between rich and poor countries. Although the highest incidence is seen in more developed regions, mortality rates are relatively much higher in less-developed countries due to late detection and poor access to treatment facilities.

In case of men, prostate and liver cancers are common. As per the WHO estimation in 2008, five per cent deaths due to cancer is mainly from Burkina Faso, the Democratic Republic of Congo, Mali, Niger, Sierra Leone, Zimbabwe and Algeria. Other NCDs which are affecting ordinary people in Africa are sickle cell disease, mental and neurological disorders, and road injury. In March 2014, WHO elevated the risk assessment of international spread of polio from central Africa, particularly Cameroon, to be very high. A new exportation event from Equatorial Guinea demonstrates that the risk of international spread from central Africa remains very high.[25] Country-wise statistics on polio immunization coverage, are presented in Table A5 in Annexure.

World's Cooperation Towards Africa Health Programme

The World Health Organisation is actively engaged in the African region. It took initiatives in bringing together global partnerships to involve actively in health programme such as Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund). Established in 2002, the Global Fund is an international public–private financing mechanism and not an implementing agency. However, the Global Fund partners with countries and implementing agencies to improve health outcomes. A case in point is its partnering with others in Malawi in 2005 to strengthen human resources to optimize the implementation of interventions related to Millennium Development Goals 4, 5 and 6 relating to child mortality, maternal health and HIV/AIDS, malaria and other diseases, respectively. Between 2005 and 2009, health worker density increased by 66 per cent from 0.87 to 1.44 per 1000 populations and, using the Lives Saved Tool, an evaluation of four indicators (antenatal care; skilled birth attendance; administration of Nevirapine for prevention of mother-to-child transmission of HIV; and fully immunized children) showed that 13,187 additional lives were saved due to their increased coverage in Malawi.

'Gift from Africa' is a joint initiative of the Global Fund and Friends of the Global Fund Africa. The campaign invites private sector leaders from the continent to come together on the global stage and invest in the fight against the three diseases (AIDS, Tuberculosis and Malaria) in Africa. This campaign was announced at the Global Fund MDG Summit event in September 2010, with initial pledges of US$ 3 million from Access Bank Plc, Anglo American South Africa, Cirrus Oil of Ghana, Old Mutual of South Africa, and United Against Malaria (Nando's, MTN and Standard Bank).It has been able to raise US$ 5 million from the African private sector to support the Global Fund.[26]

Friends of the Global Fund Africa (Friends Africa) are a Pan-African organization which works to mobilize strategic political and financial support for the fight against AIDS, TB and Malaria through education, multi-sectoral advocacy and documentation. The organization targets every sector that can aid in overcoming the three pandemics, including civil society, the private sector and government while addressing the

participation of all levels of society spanning from influential African lawmakers/parliamentarians to vulnerable community members all over the continent.

Partnership for Maternal, Newborn & Child Health (PMNCH) is the global health partnership launched in September 2005 to accelerate efforts towards achieving MDGs 4 and 5 which relate to child and maternal mortalities. It is the result of the merger of three existing partnerships: Partnership for Safe Motherhood and Newborn Health, Child Survival Partnership and Healthy Newborn Partnership.

Roll Back Malaria (RBM) Partnership is the global platform for coordinated action against malaria launched in 1998. The initiative is composed of a multitude of partners, including countries endemic with malaria, bilateral and multilateral development partners, the private sector, non-governmental and community based organizations, etc. RBM's strength is to form effective partnership both globally and nationally. Partners work together to scale up malaria control efforts at country level and coordinate their activities to avoid duplication and ensure optimal use of resources. Objective of RBM partnership is to reduce malaria morbidity and mortality by reaching universal coverage and strengthening health systems globally especially LDCs.

President's Malaria Initiative launched in 2005 focuses on expanding coverage of four highly effective malaria prevention and treatment interventions to the most vulnerable populations, i.e., pregnant women and children less than 5 years of age. These interventions are insecticide-treated mosquito nets, indoor residual spraying with insecticides, intermittent preventive treatment for pregnant women and prompt use of artemisinin-based combination therapies after malaria has been diagnosed.

Indian private and public sector as well as non-governmental agencies could also consider taking such initiatives in bringing together philanthropists to contribute towards Africa's determination to achieve health for all in the shortest possible period.

Indian Interventions and Their Impact

Indian interventions in healthcare sector involved government, private sector and other stake holders. Their target and effect have been on improving affordable access to quality health care across Africa and to develop local capacities in this area. Some of the major interventions are outlined below.

Engagement of Indian Pharmaceutical Firms in Africa

Indian engagement has been growing at an accelerated pace in the sunrise sector of healthcare and medicine through export of high-quality but low-priced Indian pharmaceuticals to African countries, the setting up of business partnerships with hospitals in Africa and the medical and wellness treatment of Africans in India.

Investment: India's Outward FDI (OFDI) in the manufacturing sector especially in pharmaceuticals in Africa has shown an uneven annual distribution during the period of 2008 to 2014 as can be seen in the Table 6.

In the year 2008, OFDI was USD 50.90 million but it has drastically declined to USD 5.06 million in 2010 due to the global economic recession. Recently, we have witnessed a significant rise in OFDI, reaching the peak in 2013. Indian firms are investing mainly in Egypt, Ethiopia, Kenya, Mauritius, Mozambique, Nigeria, South Africa, and Tanzania. Some of the major Indian pharmaceutical joint ventures or subsidiaries manufacturing or trading in Africa are Ajanta Pharma Ltd., Alkem Laboratories, Aurbindo Pharama Ltd., Ashish Life Science Pvt. Ltd., Bliss GVS Pharma Ltd., Cadila Healthcare, Celogen Pharma Pvt. Ltd., Cipla Ltd., Dr Reddy's Laboratories, Emami Biotech Ltd., Emcure Pharmaceutical Ltd., Glenmark Pharmaceuticals, Healthcare Global Enterprises Ltd., Intas Pharmaceuticals Ltd., IPCA Laboratories, J B Chemicals, Lucid Pharma Private Ltd., Lupin Ltd., Macleods Pharmaceuticals Ltd., Nestor Pharmaceuticals Ltd., Orchid Chemicals and Pharmaceuticals Ltd., Parenteral Drugs (India) Ltd., Ranbaxy

Laboratories, R.N. Laboratories Pvt. Ltd., Span Divergent Ltd., Sun Pharma and Twenty-first Century Pharmaceuticals Private Ltd.

We list below some development initiatives of the major Indian pharmaceutical firms to promote healthcare facilities in Africa.[27]

Table 6: India's Outward FDI to Africa in Pharmaceutical Industry

Year	Outward FDI (USD Million)
2008	50.9
2009	7.04
2010	5.06
2011	16.84
2012	9.46
2013	88.86
2014	67.4
2015	471.75
2016	147.68
2017	23.76

Source: RBI Monthly Data on Outward FDI from India 2008-2017.

Cipla, the largest generic Indian firm has taken the initiative to reduce the cost of HIV/AIDS treatment by bringing down the price of Antiretrovirals (ARVs) below one dollar per day. This initiative is called Cipla's Dollar a Day Treatment Programme. In 2011, this initiative had taken place in four African countries—Cameroon, Kenya, Lesotho, and Zambia. Cipla aggressively targeted the AIDS market in Africa by offering drugs at much lower price than the US and European companies. Cipla offered a triple-therapy drug cocktail to African nations for approximately USD 600, undercutting the first round of discounts by the transnational drug producers. Cipla also extends an innovative 'Mother-Baby Pack' for preventing mother-to-child transmission of HIV/AIDS in collaboration with UNICEF and other partners. The Mother-Baby Pack contains the entire range of anti-retroviral drugs and antibiotics required by an HIV infected mother starting from the 14th week of pregnancy until the 6th week after delivery. Cipla Medpro, a hundred per cent subsidiary of Cipla Ltd., has now a very strong presence across therapies in South Africa. Its manufacturing facility at Durban is the first Pharmaceutical Inspection Convention (PIC) compliant facility in South Africa. Cipla Quality Chemical Industries Ltd. (Cipla QCIL) is a state of the art manufacturing plant in Uganda that manufactures WHO prequalified antiretrovirals, antimalarials, and antivirals for the treatment of hepatitis B. The plant, according to Cipla, is the largest in East Africa and supplies the Ugandan market and exports to East Africa. The firm is now focussing on medicines for tropical diseases such as sleeping sickness, worm infestations and hepatitis C.[28] The company has recently decided acquire South Africa's Mirren (Pty) Ltd. For USD 33 million to strengthen its foothold in Africa. It has already agreed to acquire the pharmaceutical firm Anmarate Pty Ltd for about USD 1.8 million.[29]

Another Indian pharmaceutical firm that has done exemplary work in providing affordable ARVs making a dent on HIV/AIDS is Sunpharma. The company holds a firm belief that Anti-retroviral (ARV) therapy is an essential tool in waging the war against HIV/AIDS. Hence, they took a conscious decision to manufacture and supply affordable, high quality generic ARV treatments to patients around the world. They offer today a wide range of World Health Organisation prequalified (WHO PQ) ARV products that are supplied in over 90 countries in Africa, Latin America, CIS and Asia. Currently close to a million patients worldwide are estimated to use their ARV products for daily treatment needs. They have been associated with this cause since 2001 offering ARVs to various National AIDS treatment programmes in Africa. They were also responsible for making these drugs affordable in order to improve access. In 2004, the Clinton Health Access Initiative (CHAI) was signed up with a view to reducing the cost of the triple drug cocktail for consortium partners in Africa and other countries. Ever since, they have been launching newer drugs and combinations for treating HIV. Currently, SunPharma is leveraging its global network of offices, affiliates, joint ventures and alliances to make ARV products available to patients around the world. SunPharma's ARVs are being sourced

for various large scale treatment programmes by major institutions such as: UNICEF, UNITAID, Red Cross, UNDP, IDA and several others. Presently they are the leading supplier of ARVs to global NGOs, institutions and government programmes.

Ranbaxy Laboratories had launched the drug Synriam in 2012 as an efficient and simpler treatment for malaria. Ranbaxy also filed new drug applications for marketing Synriam in many African countries. They operated in 52 countries in the African continent and the Middle East. Africa was an important market for Ranbaxy and the company continues to invest substantially in the region. It had manufacturing capacities in Nigeria. The company had started work on a green field manufacturing facility in Egypt in end 2012 with a capacity to produce 50 million tablets per year. SunPharma acquired the firm Ranbaxy Laboratories in 2015.

Dr Reddy's Laboratories (DRL) focussed on key therapeutic areas like Central Nervous System (CNS) and Primary Care. The company has commenced operations in South Africa through Triomed in 2000[30] who were holding registration for two of its products, namely, OMEZ (Omeprazole) and CIFLOC (Ciprofloxacin). Consequent on acquisition of the firm by Aspen, DRL entered the market directly through a joint venture with Venturepharm in 2004. In the year 2010, the joint venture became a 100 per cent wholly-owned subsidiary of DRL.[31] Over the last few years, DRL has been on a double-digit growth in Africa.[32]

IPCA Laboratories exports branded and generic formulations as well as Active Pharmaceutical Ingredients (APIs) to 30 African countries. The company markets branded formulations in countries like Uganda, Ghana, Ivory Coast, Burkina Faso, Zimbabwe, Sudan, Tanzania, Kenya, Ethiopia and Nigeria through dedicated field force. The company is expanding its branded formulations business in the African continent through expansion of field force and geographical coverage and increase in the number of branded formulations marketed. The company is also continuously filing new formulation dossiers for registration in African countries. During the year 2013-14, its exports of formulations and APIs to Africa were of the value Rs. 566.34 crore.

Cadila Pharmaceuticals Ltd. is also a major player in the African generic drug market. Subsidiary companies of Cadila working in Africa are Zydus Healthcare S.A. (Pty) Ltd (South Africa), Simayla Pharmaceuticals (Pty) Ltd (South Africa) and Script Management Services (Pty) Ltd (South Africa).

J.B.Chemcials and Pharmaceuticals Ltd. (JBCPL) is another leading Indian pharmaceutical company which manufactures and markets a diverse range of pharmaceutical formulations, herbal remedies and APIs. JBCPL exports to many countries worldwide with a strong presence in South Africa. In 2006, it made a major strategic investment of $5.1 million in Biotech Laboratories (Pty) Ltd of South Africa. it currently holds 95 per cent stake in Biotech Laboratories. South Africa holds good growth potential, and with the large marketing reach of Biotech, both JBCPL and Biotech expect to expand and strengthen their presence in the African region. South Africa is a strategic market for the company with focus on branded generics and for certain contract manufacturing products. Its product range is across segments like cardiovascular, gastro, Central Nervous System drugs, respiratory, derma and antimicrobials.

Lupin Ltd. is a major generic pharmaceutical player in South Africa. Lupin's South African subsidiary Pharma Dynamics has consistently performed and became the 4th largest generics company and 12th largest pharmaceutical company in the South African market. It remains the largest company in the cardiovascular segment. Pharma Dynamics launched 6 new products and remains focused on the central nervous system (CNS) and over-the-counter segments within the South African market. Pharma Dynamics crossed SAR 1 billion revenue in 2017. Its current focus is on TB products across Africa. In 2014, Lupin entered into a long-term strategic partnership with Merck Serono, the Biopharmaceutical division of Merck.

Another area where the partnership in healthcare between Africa and India has

Table 7: Indian Hospitals in Africa

Hospital Groups	Country	Details
Narayana Hrudayalaya Ltd	Kenya	Financing from Abraaj Group's Africa Health Fund and the International Finance Corp. the group is partnering with Kenyan investors were to set up a 130-bed specialist cardiac hospital in the capital, Nairobi, in January 2017
Medanta Hospital	Kenya	Set up a 200-bed facility in the East African nation of Kenya. Medanta Africare, a joint venture between Kenyan investors and Delhi-based RJ Group of India, plans to begin constructing a 200-bed tertiary-care facility for $18 million in Nairobi in 2017. The company will deploy managerial and technical experts from its operations in India, where about 4,000 medical tourists seek attention annually, 40 percent of them African.
Apollo Healthcare	Nigeria, South Africa, Mauritius, Ethiopia, Tanzania and Zimbabwe	
Fortis Healthcare	Mauritius, Uganda and Nigeria, Congo	Partnering with Ciel Healthcare Africa of Mauritius in Mauritius , Uganda and Nigeria.
Dr. Agarwal's Eye Hospitals	Ghana and Mozambique	10 facilities in African nations
Shalby Hospitals	Kenya, Tanzania and Uganda	OPD clinics
Indus Healthcare Group	Botswana	

Source: Authors' Compilation.

prospered is that of hospitals and dispensaries. A number of leading Indian hospital chains with innovative practices have established or contributed to the establishment of hospital care facilities in several countries in Africa. Table 7 presents a snapshot of some of them.

Trade Partnerships in Pharmaceuticals

Africa is the second largest export market for Indian firms, after the USA. During the year 2016-017, it is estimated to have exported USD 3 billion worth of medicines to Africa. South Africa is the largest market for Indian companies in Africa. It accounts for almost a fifth of the total exports to Africa.

Government Initiatives

Focus Africa Programme

In 2002, the Government of India launched an integrated programme named as 'Focus Africa' to boost up bilateral trade and investment between India and Africa. This initiative specifically focused on seven major trading partners of in Africa, namely, Nigeria, South Africa, Mauritius, Kenya, Ethiopia, Tanzania and Ghana which contribute around 69 per cent of India's total bilateral trade. In April 2003, the programme was broadened to cover 17 more countries in Africa, namely, Angola, Botswana, Mozambique, Zambia, Zimbabwe, Namibia,

Senegal, Ivory Coast, Uganda, Madagascar, Seychelles, Egypt, Tunisia, Sudan, Algeria, Libya and Morocco. Major products for exports are broadly identified as textiles, drugs & pharmaceuticals, machinery & instruments, transport equipments and telecommunication and IT. The programme-supplemented LoC (Lines of Credit) was extended to Tanzania, and Mozambique, Zambia, Uganda, Kenya, Seychelles, Mauritius, Zimbabwe and Ghana.[33]

Team-9 Initiative

In order to enhance India's commercial relations with Western African Region, the Government of India proposed Techno-Economic Approach for Africa India Movement (TEAM9 Initiative) in 2004. Burkina Faso, Chad, Cote d'Ivoire, Equatorial Guinea, Ghana, Guinea-Bissau, Mali, Senegal and India are the participating nations in this Initiative.[34] This Initiative focuses on providing opportunity for education and training in terms of transfer of technologies in crucial sectors including pharmaceutical and healthcare. Priority sectors in these eight countries have been identified and would be financed out of USD 500 million LoC.

Pan Africa e-Network

Apart from the traditional trade and investment route, India took some initiatives in the health care sector in Africa recently through the Pan African e-Network Project (PAENP) conceived by the late Dr A P J Abdul Kalam in 2009. This was launched on 26 February, 2009 with a project cost of Rs. 5420 million.[35] The project envisages setting up of an e-network connecting Indian institutions with 53 countries of Africa through satellite and fibre optic links, and providing tele-education and telemedicine services to them. The project had been commissioned in 48 countries that had signed the agreement with Telecommunications Consultants India Limited (TCIL) for participating.[36] The list of the countries is presented below:

Under this project, medical practitioners at the Patient End Location in Africa can consult on-line the Indian medical specialists in various disciplines/specialities selected by African Union for its Member States. Any doctor from any of the remote locations can refer the patient`s medical records to any of the Super Specialty Hospital and have a Tele-Medicine video session for live diagnosis and advice by the doctors on a scheduled time in association with the provider, Super Specialty Hospital, and the receiver and the Remote Tele-Medicine centre.

Patient consultation centres have already been set up in the following 12 Indian Super Speciality Hospitals: All India Institute of Medical Sciences (AIIMS), New Delhi; Amrita Institute of Medical Sciences, Kochi; Apollo Hospitals, Chennai; CARE Hospital, Hyderabad; Escorts Heart Institute and Research Centre, New Delhi; Fortis Hospital, NOIDA; Narayana Hrudayalay,

Table 8: Pan Africa e-Network and Health Sector member countries

Western Africa	Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo; 15 out of 15
Eastern Africa	Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Tanzania and Uganda, South Sudan; 14 out of 14
Central Africa	Burundi, Cameroon, Central African Republic, Chad, Congo, DRC, Gabon and Sao Tome and Principe; 8 out of 9
Northern Africa	Egypt, Mauritania and Libya 3 out of 6
Southern Africa	Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe; 8 out of 10

Source: Authors' Compilation.

Bengaluru; Sri Ramchandra Medical Centre, Chennai; Moolchand Hospital, New Delhi; HCG, Bengaluru; Dr Bala Bai Nanavati Hospital, Mumbai; Sanjay Gandhi Institute of Medical Sciences, Lucknow.

These twelve Indian Super Speciality Centres have been connected to 49 (out of 53 envisaged) Patient-End Hospitals (PEs) in African countries viz., Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic (CAR), Chad, Comoros, Cote d'Ivoire, Djibouti, D.R.Congo, Egypt, Eritrea, Ethiopia, AU-Ethiopia, Gabon, The Gambia, Ghana, Guinea Bissau, Kenya, Liberia, Libya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Republic of Congo, Rwanda, Republic of Guinea, Sao Tome & Principe, Senegal, Seychelles, Sierra Leone ,Somalia, South Sudan, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia and Zimbabwe. India has set up Tele-medicine centres in five the Regional Super Specialty Hospitals of Africa in Nigeria, Republic of Congo, Mauritius, Egypt and Senegal.

At present, the Tele-Medicine consultations are regularly being conducted from these Super-Specialty Hospitals in India to the African countries on need basis. As of now, the following 18 medical disciplines are offered to African countries by tele-medicine: General (Internal) Medicine, Radiology, Adult Cardiology, Pediatric Cardiology, Dermatology, Endocrinology, Infectious Diseases/HIV-AIDS, Neurology, Gastroenterology, Nephrology, Pathology, Psychiatry, Pediatrics, Medical Oncology, Urology, Genetics, Gynecology ad Ophthalmology.[37] It is now an Agenda 2063 flagship programme.

The Tele-Medicine network also provides continuing medical education (CME) services based on the selected Super Specialty disciplines in the medical courses offered by the Indian and AU Regional Super Specialty Hospitals as a certificate and diploma course as per the AU requirement. Regular CME sessions have been started from April 22, 2009 from SSHs.

The project as originally conceived was for India to build up the infrastructure and facilities and for the participating countries to bear the operational cost after 5 years. In July, 2017, the Government of India handed over the project to the Africa Union (AU) Commission. The AU took steps to avoid interruption of services and also to expand the network. As per the progress report presented by the Chairman of the AU on 30 March 2018, as of March 2017, the PAeN achieved the following-

- 22,000 students obtained degrees in various undergraduate and graduate disciplines from various Indian universities through the network;
- 770 Tele-medicine consultations and tele-expertise sessions were carried out annually; and
- 6,700 Continuous Medical Education (CME) sessions were held through the network for nurses and doctors.

Box 1: India-Tanzania Cooperation in Medicines

India gifted Tanzanian Shilling 2 billion worth of medicines to Tanzania in September 2018. They consisted of essential medicines, maternal and child health products, vaccines, medicines for infection and so on. It was a modest contribution by India to support the efforts of Government of Tanzania to enhance healthcare services to its people

Medical Treatment in India

For want of expertise in medical services, finance and governance, health infrastructure in Africa is facing problems. India is one of the top destinations[38] for African patients due to favourable climatic conditions, availability of herbal medicines and high quality super speciality hospitals. Traditional and alternative medicines like Ayurveda, Naturopathy, Yoga, and Homeopathy facilitate medical tourism. India known mostly for its cost-effective medical treatments along with high standards[39] in cardiology, orthopaedics, nephrology, oncology

Box 2: India's Development Cooperation with Ethiopia

"India has also provided to Ethiopia a 64-Slice CT Scan Machine to Black Lion Hospital in Addis Ababa as a part of grant assistance. The flagship Pan African e-Network Project, an initiative aimed at sharing India's expertise in the field of Healthcare and Education with member-countries of the African Union Commission was launched in July 2007 in Addis Ababa. Tele-Education and Tele-Medicine services have been offered till late at nodes set up in Black Lion Hospital in Addis Ababa and in Addis Ababa University and are well-received.... Phase II of the project is planned to be launched sooner." [Anurag Srivastava, High commissioner of India to Ethiopia, in Development Cooperation Review, Sept. 2018.]

and neuro-surgery, is suitable for an average African customer who can't afford to purchase high-end products from the West. Share of African tourist arrival in India was 3.95 per cent in 2013, out of which 14.2 per cent tourists came for medical treatment, mainly from Nigeria, Tanzania, Kenya, Sudan, Mauritius, Egypt and South Africa. By 2017, 16.3 per cent of all visitors from Africa, arrived in India for medical purpose (See Table 9).

To connect international patients seeking healthcare in India, Apollo Hospitals, one of the leading medical service providers has joined hands with Emirates airlines. Under this partnership, patients coming to Apollo hospitals from the Middle East and Africa including Ethiopia, Ghana, Kenya, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia and Zimbabwe, Cote d'Ivoire can avail of the special fares.[40]

Hospitals and Health Centres

Indian entities have also been engaged in setting up health infrastructure facilities within Africa.

In 2003, Apollo group of Hospitals was the first private hospital to offer its consultancy services to hospitals in West Africa, Ghana and Nigeria. Apollo has been the project consultant for setting up a 100-bed multi-speciality hospital in Ghana. Apollo Hospitals have been active

Table 9: African Tourist Arrival in India for Medical Treatment

Countries	Number of Arrivals	Medical Purpose (%)	Number of Arrivals	Medical Purpose (%)
	2013		2017	
Egypt	15062	1.1	20864	0.7
Kenya	40484	9.2	44783	21.84
Mauritius	27418	5.1	34280	3.42
Nigeria	34522	42.4	17964	44.34
South Africa	58023	0.9	52636	0.22
Sudan	8778	9.1	17093	22.25
Tanzania	23345	18.5	23026	22.55
Others	67639	13.9	91518	23.3
Total	**275271**	**14.2**	**302164**	**16.3**

Source: India Tourism Statistics 2013.

Box 3: List of Some Government of India's Initiative in terms of Development Corporation with Africa in health sector in the recent years

Project "Save an Eye" Campaign undertaken by India Botswana Chamber of Commerce & Industry (IBCCI) in coordination with the Indian High Commission and the Botswana Ministry of Health has been commendable. IBCCI raised the funds through donations from Indian businesses and other community members for carrying out this ambitious project. A total of 1426 free eye cataract surgeries were performed on Batswana in different parts of the country, by inviting a team of doctors and paramedics from the Sankara Nethralaya, a reputable charity organization based in Chennai during the months of September and October, 2011.

Government of India (GoI) has gifted 50,000 long lasting insecticide-treated mosquito nets under the Malaria control programme to the Botswana Government (Ministry of Health) in November, 2011.

India gifted one million doses of FMD (Foot-and-mouth disease) monovalent vaccine worth US$ 480,000 to Algeria to help arrest the spread of FMD disease in the country. The vaccines were handed over to the Algerian Ministry of Agriculture on 13 November 2014.

Guinea and Liberia have been severely affected by the Ebola Virus outbreak. GOI extended bilateral assistance of USD 50,000 each to Guinea and Liberia to combat the disease. In addition, GOI provided cash assistance of USD 500,000 to the WHO, a contribution of USD 10 million to UN Trust Fund for Ebola and an additional USD 2 million for purchase of protective gear to tackle EVD in the affected countries of West Africa.

Tele-education facilities offered in collaboration with Imailaka University have benefitted 228 students of Madagascar since the start of the project. Tele-medicine facilities are also being offered in collaboration with a local clinic and free consultations and diagnosis are being given to the Malagasy patients since 2010 from top Hospitals in India. In all, 108 telemedicine consultations have been done since beginning of the project and twelve patients have undergone treatment in India using the tele-medicine facility of the project. A medical delegation from Apollo Hospital group visited Madagascar and signed a MoU in May 2014 in the field of health cooperation with the Malagasy Ministry of Public Health.

On 20 November 2014, India's Honorary Consul in Freetown formally handed over to President Mr Ernest Bai Koroma GOI's gift of medicines and medical equipments (worth US$ 50,000) to combat the Ebola Virus disease. In addition, GOI provided cash assistance of US$ 500,000 to the WHO, a contribution of US$ 10 million to UN Trust Fund for Ebola and an additional US$ 2 million for purchase of protective gear to tackle EVD in the affected countries of West Africa.

An MoU was signed between Barefoot college (also known as The Social Work and Research Centre) at Tilonia, Rajasthan and Evangelical Prebysterian Church (on behalf of Government of South Sudan) on 18 August 2014, for establishing a Regional Barefoot Training and Vocational Centre (RBTVC) in Yei province of Equatorial State, South Sudan to promote solar electrification in the villages in Yei. MEA also signed an agreement with Barefoot College for providing funds amounting to US$ 500,000 (Rs. 2.48 crore) for establishing Regional Barefoot Training and Vocational Centre (RBTVC) in South Sudan. Government of India provided Rs. 10.43 crore as financial assistance to fund a Hospital project in South Sudan in 2015-16.

Source: Annual Report 2014-15, Ministry of External Affairs.

in both private and public sector in several countries in the north, east and west Africa including Tanzania, Nigeria, Ghana, Ethiopia, Kenya and Madagascar.[41] The Apollo Hospitals Group has also been training medical doctors from 24 African countries at its five facilities in New Delhi, Chennai, Hyderabad, Bengaluru and Ahmadabad. So far it has trained over 100 doctors. In 2018, it commenced training paramedics from Africa also. The partner countries include Kenya, Malawi, Nigeria, Sao Tome & Principe, Seychelles, Sudan, South Sudan, Tanzania and Zambia.[42]

In 2009, a joint venture between Vision Care Centre of Zambia and Appasmy Associates of India launched Vision Care Appasamy Eye Hospital in Lusaka for proving both minor and major eye services locally.

There have also been some sporadic efforts by India's missions abroad. The first-ever Free Eye Care Camp for Ethiopians was held at the Embassy of India in Addis Ababa on 13 December 2014. An Indian Medical Professionals Forum and an India Education Forum were established by the Embassy under its patronage to coalesce interests and consolidate the presence of the diverse Indian community.[43]

Some other initiatives at government level are presented in the Box 3.

Role of India in Improving Access to Health Care in Africa

India's Development Cooperation Instruments

There are two development cooperation instruments through which India extends development assistance to Africa. The first is India's Technical and Economic Cooperation Programme, which is primarily managed by the Ministry of External Affairs, and the second is lines of credit (LoCs), which were managed by the Department of Economic Affairs (DEA), in the Ministry of Finance (MOF), until 2003-04. After 2003-04, this system was changed as the GOI stopped signing any credit agreements directly with the recipient country. Instead, it began to extend lines of credit through the Export-Import (EXIM) Bank of India. All LoCs are now managed by the EXIM Bank.

Line of Credit (LoC) is one of the main instruments of India's development assistance to least developed and developing countries in recent years. During the last decades, 244 LoCs aggregating US$ 24189.83 million have been allocated to various developing countries. Out of the 244 total projects, 167 (68.4%) of them were in African region amounting to US$ 9319.15 million. During the period 01 April to 31 January 2015, 14 LoCs amounting to US$ 2272.61 million have been sanctioned. The allocation to Africa during this period is US$ 881.17 million, including US$ 200 million for Mauritius for equity participation in a Special Purpose Vehicle for the Light Rapid Transit project, US$ 184 million for an Hydroelectric Project in Burkina Faso, US$ 150 million for strengthening agriculture mechanisation in Ghana, US$ 65.68 million to Mauritania for solar diesel hybrid rural electricity project, US$ 62.95 million to Senegal for Rice self-sufficiency programme and US$ 45 million to Gambia for electrification expansion.

Exim bank also funded major health sector related projects in Africa. Some prominent projects include US$ 8 million to Seychelles for implementation of Integrated Health Information System, US$ 5 million to Senegal for supply of medical equipments, furniture and other accessories to four hospitals, US$ 50 million to Zambia for setting up of pre-fabricated health post, US$ 35 million to Guinea to strengthen their health systems, and US$ 71.40 to Cote d'Ivoire for upgrading their military hospitals.

Export of Pharmaceutical Products

India's Pharmaceutical firms have not been affected much by the worldwide crisis in 2008, mainly due to cost advantages in production. Indian firm has a modest performance[44] in terms of exports. Share of pharmaceuticals in India's total exports has increased from 2.1 per cent in 2000-01 to 4.36 per cent in 2017-18. The exports

of pharmaceutical products were valued at USD 13.12 billion in 2017-18.[45] The major export destinations for India's pharmaceutical sector during 2017-18 were: United States (36 per cent), South Africa (4 per cent), United Kingdom (3per cent), Russian Federation (3 per cent), Nigeria (3 per cent), Tanzania (2 per cent).

In this segment we have adopted the definition of pharmaceutical products that falls under the HS code 30. All the major pharmaceuticals products, bulk drugs, and formulations gets covered in the HS code 30 labelled "Pharmaceutical products". In our study we have classified the African Region as per the United Nation Statistical Division. All the 54 African Countries are broadly classified into five regions: Eastern, Middle, Northern, Southern and Western Africa. Eastern Africa consists of Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, South Sudan, Uganda, Tanzania, Zambia, and Zimbabwe. Middle Africa consists of Angola, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of Congo, Equitorial Guinea, Gabon, and Sao Tome and Principe. Northern Africa consists of Algeria, Egypt, Libya, Morocco, Sudan and Tunisia. Southern Africa consists of Botswana, Lesotho, Namibia, South Africa and Swaziland. Western Africa consists of Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.

Our study infers that Africa's total pharmaceutical imports from world was US$ 3.073 billion in 2007 which grew at a Compound Annual Growth Rate (CAGR) of 13.88 per cent in the last 11 years and reached USD 12.86 billion in 2017. Africa's total pharmaceutical imports from India is increasing significantly from US$ 134.12 million in 2007 to US$ 2.47 billion in 2017 at a CAGR of 30.31% per cent followed by China at 27.95% per cent, Belgium at 19.95 per cent and Germany at 17.97 per cent in the span of 11 year (for details see Table A7 in Annexure). India surpassed France as the largest exporter of pharmaceutical products to African region in 2015. In 2017, India is still the largest exporter of pharmaceuticals to Africa, at $US 2.47 billion followed by France at $US 2.28 billion. The highest jump in Africa's imports of total pharmaceuticals annual growth was seen in 2013, mainly due to Ebola outbreak in western Africa in this period.

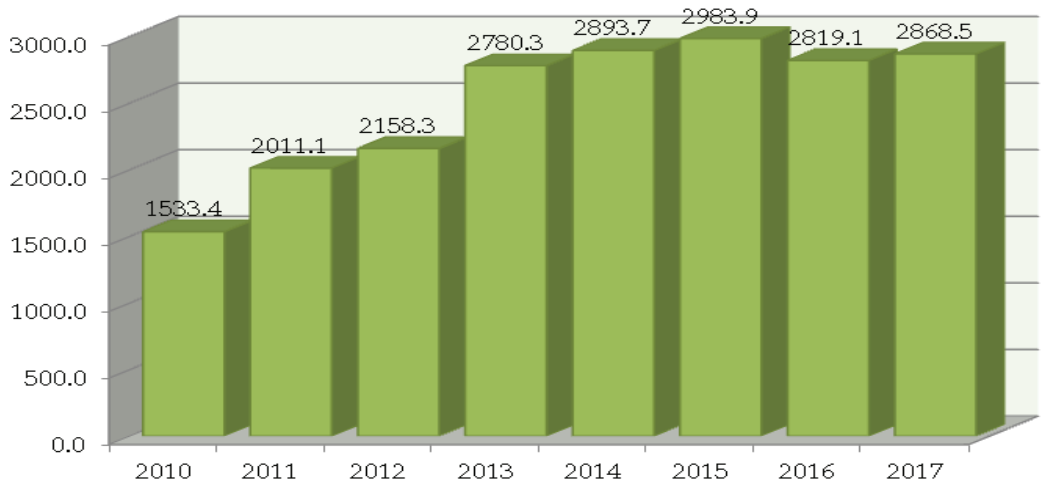
Our analysis demonstrates that India's pharmaceutical sector plays a major role in the African health sector. India is the largest supplier of pharmaceuticals to Africa comprising of 19.22 per cent of total pharmaceutical product imports in the region. India is followed by France which comprises of 17.75 per cent and Germany at 12.60 per cent of Africa's total pharmaceutical imports. The situation is dramatically very different from the post financial crisis year of 2007. In 2007, France was the leading supplier of pharmaceuticals to Africa, comprising of 24.56 per cent of total pharmaceuticals exports to Africa. Whereas India stood 7th in the list after France, Switzerland, Germany, United Kingdom, United States, and Italy comprising of just 1.78 per cent of total pharmaceutical imports in the region.

It is evident from our analysis that Africa's dependence on India for supply of pharmaceuticals has grown exponentially in the last 10 years. Figure 14 reflects the growth of India's exports to Africa as reported by India, from 2010 till 2017. The figure shows that within this period our export to the African region grew by 46.54 per cent.

Region-wise breakup of India's pharmaceutical exports to Africa is shown in figure 15 below. The figure shows that much of our focus for the export of pharmaceuticals has been towards the Eastern African region. This is also the region that has seen much of growth in the pharmaceuticals exports from India. This region is followed by Western and Southern Africa, both showing modest growth during 2010-2017. Both, the current share of our pharmaceuticals export as well as the growth of exports, have been very limited in the Middle and the Northern African region.

At the country level, we have observed that the major export destinations of India's

Figure 14: Total exports of Pharmaceutical products from India to Africa, 2010-17 (Million $US)



Source: WITS COMTRADE database.

Box 4: Antiretroviral Drugs
Story of the Fight Against HIV/AIDS

The sunset years of the 20th century marked a sceptre haunting Africa and other countries, the sceptre of human Immunodeficiency Virus infection and Acquired Immunodeficiency Syndrome (HIV/AIDS). Since the first clinically reported case in the United States of America in June 1981, though there was an earlier case in Congo in 1959, it spread like a pandemic all across the world. Africa was one of the most affected by this dreaded disease. The initial years marked total absence of any effective drug to fight the epidemic but soon research led to development of number of drugs for the illness. However, being new drugs they were within patent protection.

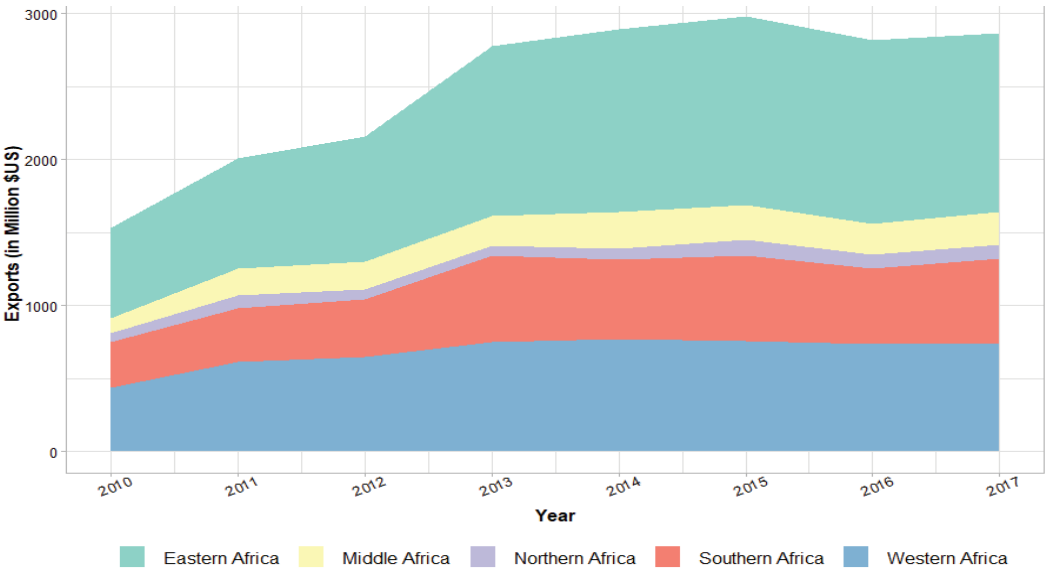
As a result, pharmaceutical companies were quick to reap economic rewards from this great human tragedy and put very high prices on the drugs. This resulted in high unaffordable cost for the medicines in most of Africa, naturally making the access beyond the reach of ordinary people, leading to higher fatality and fast spread of life threatening situations. Attempts by several governments including of South Africa to acquire cheaper form of the antiretroviral (ARV) drugs were stone-walled by multinational pharmaceuticals on grounds of patent protection rights. They sued many governments for violation of IPRs. This paved the way for the emergence of path-breaking partnership between India and Africa in generic medicine supply.

The Indian pharmaceutical company, CIPLA, a generic manufacturer, took up the challenge and manufactured the AIDS drug, Zidovudine (AZT), in collaboration with scientists of the Indian Institute of Chemical Technology (IICT), Hyderabad. Later, CIPLA launched Triomune, "the world's first three-in-one antiretroviral (ARV) drug with Stavudine, Lamivudine and Nevirapine". In February 2001, CIPLA announced that it would sell the generic version for less than one dollar a day in Africa. This bold new initiative made affordable HIV/AIDS drugs available to African countries and they were able to fight the epidemic successfully.

Soon HIV/AIDS were included in the Millennium Development Goals and global programmes on access to medicines. It also led to the formation of a High Level Panel on Access to Medicines by the United Nations Secretary General in 2015. SDGs also include HIV/AIDs targets to be attained by 2030.

Source: Authors' Compilation.

Figure 15: India's Exports of Pharmaceutical to Regions of Africa 2010-17



Source: WITS COMTRADE Database.

pharmaceutical products in Africa are South Africa, Nigeria, Kenya, Tanzania, Ghana, Uganda, Ethiopia, Zambia, Mozambique, and Zimbabwe. The graphical representation of India's total pharmaceuticals export to African countries from 2010-2017 is shown in figure 16. According to our analysis, South Africa imported 16.61 per cent of all pharmaceutical products that we exported to Africa from 2010-2017. It was followed by Nigeria at 13.19 per cent and Kenya at 9.55 per cent (detailed country level tables are given in Annexure table A8).

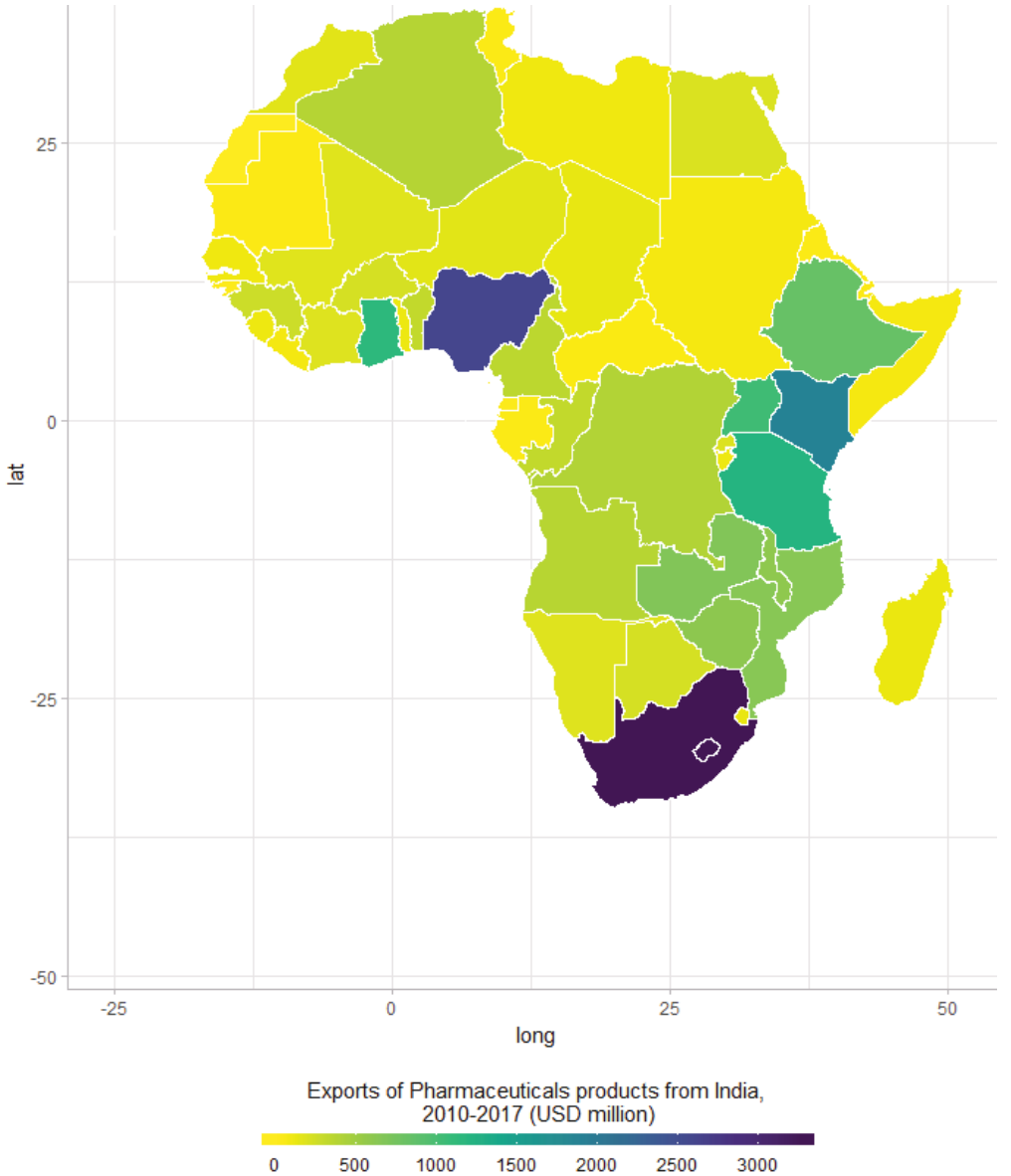
India-Africa Partnership in health care has made significant progress since India Africa Forum Summit III in October 2015 when India announced a contribution of USD 100 million towards India-Africa Development Fund. An important component of this amount was the allocation of the USD 10 million as seed grant towards India-Africa Health Fund. It also envisaged 50,000 scholarships for African students to study in India. Apart from the ITEC programmes of the Ministry of External Affairs, the Ministry of Science and Technology grants the CV Raman Fellowships and the Indian Council of Medical Research (ICMR) has the International Fellowship Programme for scientists belonging to developing countries, both of which are open to African health scientists. ICMR and African Union have established an India Africa Health Sciences Platform to promote research collaborations.

New Challenges for Africa in Health Care

Overall the health standards of people living in the African region has improved considerably during the last 25 years. However, in order to attain the goal of health for all envisaged both in SDG 3 and Agenda 2063 Africa would have to address the following priority areas and indicative strategies:

- Citizens enjoy long and quality health lives
- Nutritional status of citizens are acceptable by international standards
- Expand access to affordable quality health care and services
- Develop/implement programmes to combat communicable and non communicable diseases
- Develop human capacity for the health sector Promote policies for sustainable financing of the health sector
- Promote policies that will enhance access to balanced diets
- Promotion of nutrition surveillance and

Figure 16: India's Exports of Pharmaceutical Products to Africa from 2010-2017



Source: Authors' analysis of WITS online database.

intervention programmes.

Quality of health care has the potential to transform the risks of demographic and disease burdens into a demographic dividend and opportunity to transform the pharmaceutical industries.[46] At the same time, political constraints and gap between the accessibility of health care services need to be removed; a transparent standard harmonization system should be followed for good health of all people in Africa.

Opportunities for Development Cooperation between India and Africa

Both Indian and African economies are projected to grow rapidly in the coming decades. Consequent to increase in per capita GDP in their economies, health care expenditure per capita is also likely to go up considerably creating a substantial market for more health care products

and services.

Africa also needs international cooperation from all across the globe for achievement of the health goals in SDGs and also in Agenda 2063. SDG 3 envisages ensuring healthy lives and promote well-being for all at all ages by 2030. Similarly, Goal 3 of Agenda 2063 envisages healthy and well nourished citizens by 2063. India is committed to share its vast and effective skills, knowledge and experience in this field to the timely attainment of these goals.

Strengths of India in Pharmaceuticals

Generic manufacturing

India's strength in pharmaceuticals is its strong generic industry. It currently manufactures over 400 bulk drugs and 10,000 formulations. These products are cost competitive with US and European products and help to reduce the medicinal prices significantly and provide larger access to affordable medicines. India is also committed to assist the developing countries to take benefit of this lucrative opportunity.

Rich Heritage of Traditional Medicine

India has three major formal traditional medicine systems. These systems – Ayurveda, Siddha and Unani – are based on its own pharmacopoeias and are time tested. They are in wide use all over the country through both formal and informal streams and in both public and private sector. There is also well regulated formal education system for the India Systems of Medicine (ISMs). India has also established separate Medical Councils for these systems. India is willing to share its knowledge and experience in this field with the partner countries

Large Health Service human resources (doctors, nurses)

Thanks to comparatively early development of higher medical education institutions with English as the medium of instruction, India has been producing large numbers of medical and paramedical professionals. They are quite willing to offer their services at reasonable rates in other parts of the world.

Possible Areas of Cooperation

Manufacturing

Consequent upon the introduction of the new patent regime in 1972, India gained considerable experience in the manufacture of generic pharmaceutical products. Indian pharmaceutical companies are quite strong in manufacturing processes. This expertise could be shared with Africa and used in the development of indigenous pharmaceutical industries in the African continent. It would contribute to Africa's goal of eradicating many of its chronic diseases. Harmonisation and alignment of regulatory policies and adoption of IPR policies for promoting local manufacturing would also be extremely important in this regard.

Provision of health care services such as hospitals and medical education

Over the years, India has attained considerable capability to establish general and super speciality hospitals. Some of India's hospital chains have established their own health facilities in the African continent. This process could be further extended. India is willing to share its experience with interested partner countries in Africa and other parts of the world.

Policy and Law

India holds the distinction of negotiating the difficult path of implementing the TRIPS (Agreement on Trade Related Aspects of Intellectual Property Rights, 1994) compliant Intellectual Property Right (IPR) regime. It has drafted its IP laws, particularly the Patents Act, keeping the TRIPS flexibilities in the forefront. Its provisions in the law to prevent ever greening of pharmaceutical patents keeping in view the Doha

Declaration and the needs of the developing countries. In order to prevent patenting of traditional medicine knowledge, its patent law prohibits grant of patents to inventions which are based on traditional knowledge. It has also drafted a *sui generis* law for the protection of geographical indications which provide protection for manufactured goods also such as handicrafts and handlooms as well as natural products which have medicinal values. Africa also has a strong tradition of manufacturing such local specific products. India also enacted biodiversity legislation in accordance with the Convention on Biodiversity which protects the biological resources of the country. These resources are of high value in the utilisation of traditional medicines. Thus, India has the capability to establish a model regime for other developing countries in this regard keeping in view their specific requirements. This expertise in policy and law making could be shared with African countries.

Traditional Knowledge

Traditional medicines form the major chunk of traditional knowledge and there have been attempts in some of the developed countries to patent such knowledge. In order to prevent such misappropriation India has established a Traditional Knowledge Digital Library (TKDL). It contains entries in a patent application format. The library is in five international languages, namely, English, French, German, Spanish and Japanese. It currently has 292,662 traditional medicine entries.[47] This library has been able to prevent grant of patents based on traditional knowledge in large number of cases. As per an earlier study done by RIS, there have been 58 cases of withdrawal of patent applications in European Patent Office, one application terminated in the UK Patent Office and one application withdrawn in the US Patent and Trademark Office because of prior evidence in the TKDL. Claim amendments have been made in 29 cases in various patent offices.[48] The library is available free of charge to any patent office. India is ready to share its experience in this field with African countries, thus contributing to their own efforts towards protection of their traditional knowledge.

R&D

Large profit oriented pharmaceutical companies have very little interest in developing new medicines for diseases that largely affect low income countries because of lack of high returns. These countries themselves will have to take the initiatives in this regard and such initiatives necessarily will have to be low cost. India has a very good experience with an alternative route of drug discovery in its Open Source Drug Discovery (OSDD) programme. India would be prepared to consider partnering with Africa in its innovative R&D programmes with a view to finding drugs for diseases that affect Africa most.

Clinical Trials

Clinical trial studies are growing at exponential levels the world over with much scope. During the last 15 years, the number of clinical studies around the globe has gone up from 5635 in 2000 to 262,389 in 2018. By February, 2019, the number of studies registered stands at 298,601.[49] Rising drug development costs and globalisation have led to an increase in outsourcing of clinical trial studies. Africa and India are fertile grounds for such studies with cost advantages and also concentration of a number of diseases. However, it is imperative that India and Africa should work together for proper regulatory mechanisms and practices of global standards.

Such trials have been conducted in most of the African countries also. However, Africa's share in the global clinical trial studies is only 2.75 per cent. At the same time, Africa has the potential to conduct more clinical trials and opportunities exist for developing additional clinical trial capacity throughout the continent. (Bairu and Chin). However, to develop those capacities the countries will have to adopt Good Clinical Trial Practices. GCP is an international

(ICH) ethical and scientific quality standard for designing, conducting, recording and reporting clinical trials. Compliance with GCPs provides public assurance that the rights and safety of participants in human subject research are protected and that the data that arises from the study is credible. It also enables mutual acceptance of data among regulators. India has developed recently detailed guidelines for bringing the clinical trial studies in the country to global standards and practices. Standardisation of clinical trials and data can contribute towards greater collaboration between India and Africa.

Other Possible Areas of Cooperation

The cooperation programme can also include civil society initiatives like the Barefoot College, Ajmer offering short-term training programmes for grandmothers in solar electrification of villages leading to mini solar plants available for diagnostic clinics and maternal health centres.[50] Sharing of experiences and extending technical support to Africa to introduce low cost health care schemes such as the micro health insurance scheme, *Yeshasvini*, launched by Karnataka Government[51], and extending access to low-cost diagnostic kits developed by the Indian Council of Medical Research[52] could also be considered.

What India can offer to Africa

- Indian firms can establish local manufacture units or Joint ventures
- Establish a good network of supply chain management
- Supply quality medicines at concessional rates for major diseases like HIV/AIDS, TB, Malaria, Cardiac diseases

India-Africa Forum Summit 2015

In the partnership programmes with Africa, the Third India-Africa Forum Summit in 2015 was a landmark event. It came out with a broad framework agreement and also specific commitments for strategic cooperation. Box 5 presents the broad areas of the Framework.

Post India-Africa Forum Summit in October 2015, India's development partnership with Africa has further strengthened significantly. As may be seen from Table 3 (supra), Africa's share in India's total bilateral development assistance has increased from 2.37 per cent during 2015-16 to 4.79 per cent in 2017-18. In absolute terms it has increased from Rs. 200 crore to Rs. 330 crore which is an increase of 65 per cent. The Delhi Declaration 2015 issued at the end of the Forum, among other things, spelled out India's commitment to health sector cooperation in the following areas:

- *Enhance joint cooperation in health and pharmaceutical development as well as telemedicine and traditional medicine, jointly combat diseases and pandemics and increase the efficiency of health institutes through comprehensive training programmes and coordination at international level to harness modern scientific technologies for medicine and treatment;*
- *Cooperate in the training of doctors and healthcare personnel including through telemedicine, medical missions, promotion of the use of traditional medicines and regulatory procedures as well as combating the challenges posed by pandemics;*
- *Cooperate in ensuring access to affordable medicines and foster innovation to address public health needs of developing countries by making full use of the flexibilities available under the WTO TRIPS Agreement.*

In the Strategic Framework that was discussed and agreed to in the India-Africa Forum Summit 2015, it was recognized that the promotion of health was critical in the development of human capital, which drives socio-economic growth. The summit reaffirmed its commitment to enhance collaboration and share experience in the application of advancement in science, technology, research and development to training in the area of HIV, TB, Malaria, Ebola and Polio.

It also recognized the need to improve nutritional and food security of their people and

Box 5: Third India-Africa Forum Summit 2015: India Africa Framework for Strategic Cooperation

The Heads of State and Government and Heads of Delegation representing the continent of Africa, the African Union (AU) and its Institutions, and the Prime Minister of the Republic of India, met in New Delhi, India on 29 October 2015 for the Third India-Africa Forum Summit. In this forum the leaders from 54 African nations and India adopted a general framework for improving strategic cooperation between them. The framework comprises of the following broad areas:

- Economic Cooperation
- Cooperation in Trade and Industry
- Cooperation in Agriculture
- Cooperation in Renewable Energy
- Cooperation in Blue/Ocean Economy
- Cooperation in Infrastructure
- Cooperation in Education and Skills Development
- Cooperation in Health
- Cooperation in Peace and Security

Regional and other forms of cooperation: This includes enhancing ongoing cooperation in the areas of capacity building, human resource development, food and agriculture processing and soft loans for regional projects among others.

The forum also agreed to establish a regular formal monitoring mechanism to review the implementation of the agreed areas of cooperation and identified projects by the competent bodies of the partnership. This framework is expected to strengthen the socio-economic ties in between the two regions moving towards common goals of development.

Source: Press Information Bureau, Government of India: http://pibphoto.nic.in/documents/rlink/2015/nov/p201511602.pdf

acknowledged the right for adequate food for all and the availability and accessibility of food in quantity and quality sufficient to satisfy the dietary needs of the people.

The forum agreed to:

- Collaborate in the provision of universal access to primary and public healthcare, to build resilience to fight and prevent deadly epidemics and disease control through implementing educational programme in this field, recommendation of policies, administering services and conducting research;
- Support Africa's campaign on Accelerated Reduction of Maternal Mortality in Africa (CARMMA) and facilitate its implementation through cooperation in training and education for health professionals;
- Ensure access to affordable and quality medicines and treatment, particularly generic medicines;
- Acknowledged the importance of full use of the flexibilities provided by the agreement on trade related aspects of Intellectual Property Rights (TRIPS) administered by the World Trade Organization (WTO);
- Train doctors and healthcare personnel, including through the deployment of telecoms and ICTs in support of tele-medicine and e-health applications;
- Strengthen public-private sector collaboration in the areas of pharmaceutical and procurement in Africa and India in the framework of the Pharmaceutical Manufacturing Plan for Africa and the fight

Box 6: Industry Cooperation

The Confederation of Indian Industry started in 2015 the annual India Africa Health Forum. The Forum seeks to build a common platform for all stakeholders, policy makers, researchers and private players. The Forum provides an opportunity for Indian healthcare providers to interact with leaders from African Government, civil society, and the private sector to meet and discuss on specific projects for collaboration in the health sector. The Forum also aims to showcase the world class healthcare services, diagnosis, medical technology and medical research. The Forum also provides a platform for African countries to showcase the investment opportunities in the healthcare and related sectors to the potential investors who attend the event.

The 2016 India-Africa health Forum had over 200 delegates comprising of Government officials, policy makers, sector experts, private healthcare providers and investors and international organizations from India, Nigeria, Tanzania, Zambia, Senegal, Niger, Gabon, Congo, Rwanda, Uganda, and Mauritius. The 4th India-Africa Health Forum, was held in May 2018, in Mumbai, India.

Source: Confederation of Indian Industries.

against counterfeit medicines;

- Continue dialogue on intellectual property rights, regulatory procedures and access to medicines and research and development in traditional medicine;
- Share experiences, specialized expertise and best practices in health care systems development and community health programmes;
- Facilitate exchanges regarding food production to always meet dietary need and quality standards.[53]

These actions will ultimately push both the regions towards meeting the health care needs of their respective populations while moving towards and achieving the health related SDGs in time.

As a result of India's focussed attention to further consolidate India's cooperation with Africa, a number of initiatives have been taken by both sides. It has also given much needed push for the development of mutually beneficial partnerships in the field of Traditional Medicine. Since 2015, the Ministry of AYUSH has been

Box 7: e-VidyaBharati and e-ArogyaBharati

In 2018, the Government of India, in consultation with African partners decided to further invigorate financial and technical support for the Pan-Africa e-Network project, which is now called e-VBAB (e-VidyaBharati and e-ArogyaBharati) Network Project. On the occasion of its launch, Ms. Sushma Swaraj, External Affairs Minister, India said that it would serve as yet another bridge – a digital bridge – shrinking the distance between India and Africa even more.[54] The Ministry of External Affairs already signed an agreement with the Telecommunications Consultants India Ltd. (TCIL), the agency that executed successfully the first phase from 2008 to 2017, for an amount of Rs. 865 crore. The first phase was operated on satellite-based technology. Now it would have two separate web-based portals, one each for tele-education and tele-medicine which will ensure far better services in these sectors. The project aims to provide an opportunity for local employment and opens the door for access to education and medical expertise from India to African students, doctors, nurses and paramedical staff.

Source: Business Standard, 10 September 2018.

implementing a project for deputation of AYUSH experts to African countries at identified centres to organise programmes to facilitate teaching, research and health services of Indian traditional Medicine. Pursuant to decision taken in the Third Forum Summit, the first Training Programme for Traditional Medicine Regulators/Practitioners of Africa in India was held in March 2017 wherein 26 participants / experts from 11 African countries attended the programme.[55]

During the Prime Minister's visit to Kenya in July 2016, health sector constituted an important part of the discussion with the Kenyan President. On this occasion, India gifted 30 field ambulances to Kenya. India also announced the gifting of a tele-cobalt cancer therapy machine, along with essential ARV medicines and some other equipment. India also offered to positively consider a Kenyan request for the grant of a Line of Credit for the establishment of hundred bed cancer hospital in the country.[56]

During his visit to Zimbabwe in November 2018, the Vice President of India acceded to Zimbabwe's request for the supply of ten ambulances, along with life saving drugs, to Zimbabwe. Both sides recognized the huge potential in trade and investment particularly in the areas of health, traditional medicines and pharmaceuticals.[57]

The following recent interventions, as taken from Ministry of External Affairs Annual Reports from 2015-16 to 2017-18, show the keenness of India to promote development partnership in health care sector with the African countries.

In June 2016, India decided to offer one ton of medicines as grant-in-aid over the next three years to Namibia to implement its health goals envisaged under its 'Harambee Prosperity Plan'. In addition, India also agreed to provide a grant of US$ 20,000 to the Indira Gandhi Maternity, Kahao to meet its immediate need for medical equipments for the facility.

During 2015-16, India assisted Ethiopia in installation of 64 Slice CT Scan machine at the Black Line Hospital in Addis Ababa.

Two medical teams from Dr. Shroff Eye Charity Hospital in Delhi visited Botswana as part of Cataract Blindness Eradication Campaign and conducted more than one hundred surgeries following an agreement with Ministry of Health and Wellness of Botswana.

In 2017, India signed a LoC Agreement worth US$ 71.4 million to upgrade four hospitals in Cote d'Ivoire.

During 2017, nine Kenyan doctors were trained by India as part of a public-private-partnership initiative funded from India's Assistance to Africa budget.

In November 2017, India agreed to gift medicines and handed over its first tranche to Mozambique in order to improve availability of affordable medicines within the Mozambican public health system. India also provided US$ 1 million grant to Mozambican's Ministry of Health for purchase of medical equipments from India.

In August 2017, India approved a LoC of US$ 24.5 million for upgradation and rehabilitation of health care system of Senegal. In addition, India also offered an amount of Euro 50,000 to the Senegalese Ministry of Health to rehabilitate 200 physically challenged persons by fitting prosthetic limbs provided by Bhagwan Mahavir Sahai Summiti.

In July 2016, India gifted a Bhabhatron-II Cancer Machine to Bugando Medical Centre at Mwanza in Tanzania.

During 2016-17, India assisted Liberia in procuring medical equipments and CT scan unit to equip its JFK hospital in Mnroma with a grant of Rs. 2.17 crore.

During his visit to Rwanda in 2017, Indian Prime Minister announced a grant of US$ 2 million for purchase of medicines and a cash grant of US$ 1 million for the purchase of medical equipments.

In 2016, India approved an additional LoC of US$ 18 million, in addition to an earlier LoC of US$ 50 million for completion of 650 primary health post in Zambia.

India also gifted medical equipments worth US$ 1 million to Zambia as humanitarian assistance.

Since 2015, the International Yoga Day is being celebrated across Africa and this global

event is gaining significantly in its popularity as an excellent traditional system of physical and mental fitness.

A large number of Indian medical institutions have been entering into collaborative arrangements for promotion of medical research and education in Africa. An important initiative in this regard has been taken by the Public Health Foundation of India, Pan-African Society for Cardiology, the Centre for Chronic Disease Control, International Society for Hypertension and British and Irish Hypertension Society partnering to work together for building health care professionals in Africa. According to WTO estimates, the number of people affected by hypertension is highest in Africa at about 46% for adults aged 25 years and above compared to 35 to 40% in the rest of the world.[58]

Chapter IV

India and Other Countries

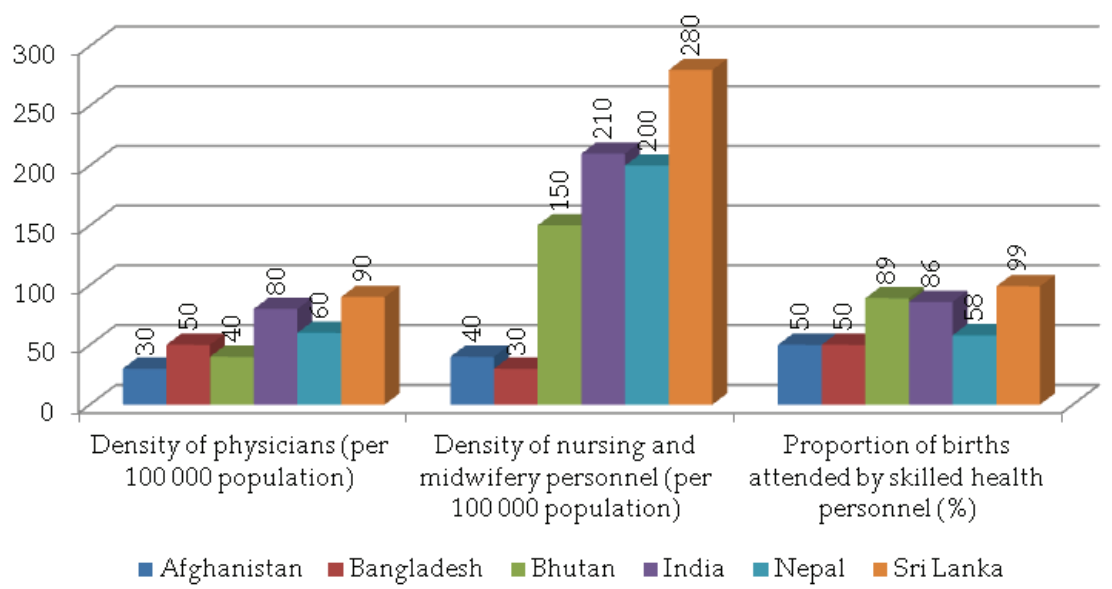
Along with Africa, the other region with low health indicators and major challenges for achieving SDG 3 is South Asia. Considering the proportion of the population of South Asia in world population, achievement of health goals in this region will decide whether the world achieves the SDG 3 targets or not.

Reaching out to Neighbours

During the colonial days, India (including present Bangladesh and Pakistan), Sri Lanka, Myanmar, Nepal, Bhutan were all under the British crown. The programmes including health sector in all these countries, by and large, were the same. At the times of their independence, the health sector indicators in these countries were also almost same. After independence, the South Asian countries began the process of mutual and regional collaborations for their economic advancement.

Presently, all major health sector indicators follow a similar pattern in these countries. On one extreme, we have Afghanistan and, on the other, we have Sri Lanka; Afghanistan at the bottom while Sri Lanka doing much better than all other South Asian countries. India's performance in health in this region is generally second to that of Sri Lanka. Figure 17 illustrates this. Sri Lanka has the highest density of physicians and nurses,

Figure 17: Status of Health care sector in selected South Asian countries



Source: World Health Statistics 2018.

followed by India. Afghanistan has the least density of physician and second least density of nurses after Bangladesh. In the proportion of birth attended by skilled health professionals, Sri Lanka again comes out as the champion with 99%.

Similar pattern follows when it comes to mapping the health profile of the population in the region. Consider figure-18 for example. Sri Lanka has the highest life expectancy at birth and the lowest MMR and Under-5 Mortality Rate (U5MR), whereas Afghanistan has the least level of life expectancy and highest MMR and U5MR. The rest of the countries show mediocre performance, between these two extremes.

Figure 19 shows the disease burden of some communicable diseases (Tuberculosis and Malaria) as well as the mortality rate attributed to NCDs. India has a huge burden of Tuberculosis which is just next to Bangladesh. Similarly, its burden of Malaria is also quite high second to Afghanistan. Probability of dying from NCDs follows the similar pattern of extremes and medians that we have seen from the previous two graphs.

India is the largest country in the South Asian Region. Although, when it comes to health related indicators, India may not be in the lead as of now but it has the largest pool of financial as well as human resource when it comes to health care sector. Both, the private and the public tertiary health care systems in India increasingly offer nearly world class facilities, labs, leading experts and doctors in the field and a much cheaper option of health care services. It was this reason that India has become a major destination for medical treatment, attracting a lot of patients from the neighbouring countries. Out of around 2.2 million tourists who arrived in India from the neighbouring countries, 13.15 per cent (around 2,88,500) of them came for medical purpose. India receives a particularly high influx of medical tourists from Maldives and Afghanistan, with percentage of Medical tourist from the two countries being 71.58 per cent and 42.57 per cent (See Table 10 for more details).

India has also been very committed to provide financial assistance to its neighbours so that they may meet their development needs. A simple country-wise disaggregation of India's bilateral assistance commitments shows that most of India's focus has been towards its immediate neighbours when it comes to providing financial

Figure 18: Health profile of population in South Asian Countries

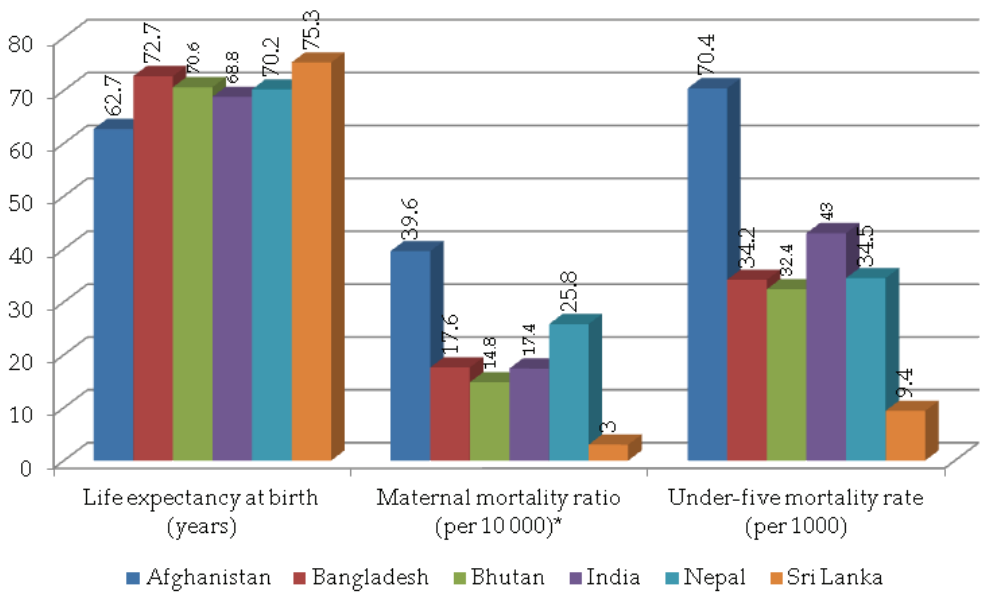
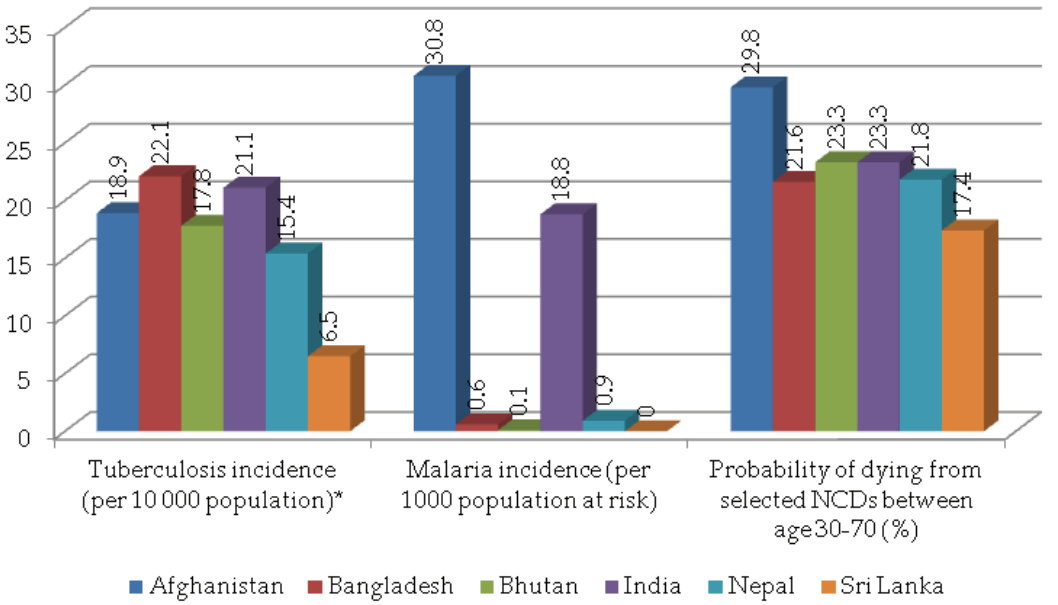


*Figure deflated to per 10 000 to match scale.
Source: World Health Statistics 2018.

Figure 19: Disease Burden in selected South Asian Countries



Note: Selected NCDs include CVD, cancer, diabetes & CRD. *figure deflated to per 10 000 to match scale
Source: World Health Statistics, 2018.

assistance. Figure 19 bears the testimony to the above statement. The figure shows that in 2017-18, 72 per cent of India's total budget for grant-in-aid were allocated to its immediate neighbours, namely Bhutan, Bangladesh, Afghanistan, Sri Lanka, Nepal and Maldives.

Table 10: South Asian Tourist Arrival in India for Medical Treatment in the year 2017

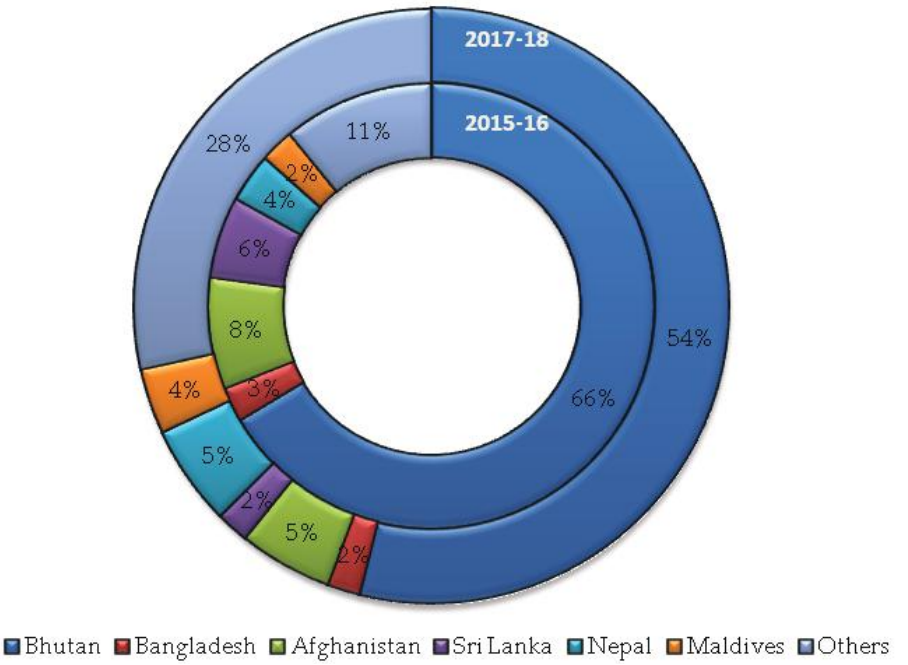
Countries	Number of Arrivals	Medical Purpose (%)
Afghanistan	123330	42.57
Bangladesh	1380409	13.14
Bhutan	39184	0.00
Maldives	67457	71.58
Nepal	16197	0.90
Pakistan	104720	6.35
Sri Lanka	297418	1.25
Total	**2194555**	**13.15**

Source: India Tourism Statistics.

India has one of largest manufacturing capacity in the world when it comes to pharmaceuticals. Indian pharmaceutical sector is colossal compared to that of its neighbours. Due to its low cost and high quality pharmaceutical products, Indian pharmaceuticals are commonly found in the neighbouring countries. Table 12 below gives a detailed account of Indian pharmaceutical exports, in value terms, to other South Asian countries. Sri Lanka and Nepal seems to be the most favoured destinations for Indian pharmaceuticals in the region and Bhutan being the least. But it should be noted that although being a small country Bhutan exports of pharmaceuticals from India is limited from Indian perspective, but when seen from the perspective of Bhutan, Indian imports of pharmaceuticals comprises of nearly 90 per cent of total pharmaceutical imports in the country.

The discussion till now affirms that India has been proactive in forming development partnership with its neighbours. Health forms a significant part of most of these development interventions. Specific country wise development and health related interventions by India are given below.

Figure 20: Distribution of India's Bilateral Assistance in South Asian Countries



Source: Ministry of External Affairs, Government of India.

Table 11: India's Export of Pharmaceuticals to South Asian Countries (in $US Million)

Destination Country	2010	2015	2017	Total
Sri Lanka	114.57	182.83	195.63	493.03
Nepal	69.92	128.41	190.53	388.86
Afghanistan	30.76	44.68	78.69	154.13
Pakistan	13.07	19.41	55.03	87.51
Bangladesh	22.32	23.73	31.55	77.60
Maldives	6.01	10.46	13.28	29.75
Bhutan	0.37	2.02	2.39	4.78
World	**6096.13**	**12544.72**	**12884.85**	**85825.97**

Source: WITS COMTRADE database.

Nepal[59]

India and Nepal initiated bilateral cooperation programmes as early as 1949, when India sent a scientific and cultural mission to build technical capabilities in Nepal. Health is one of the core sectors in the development partnership between India and Nepal. The programmes included supply of medicines and equipment to begin with, which later progressed into building health infrastructure ranging from hospitals to numerous health posts in even the farthest corners of the country. India also runs a Medical Pack Scheme for its ex servicemen residing in the country and conducts every year several medical camps in Nepal.

There are many other interventions in the area of health. Some of them are highlighted below.

B.P. Koirala Institute of Health Sciences (BPKIHS) at Dharan is the biggest hospital-cum-medical College outside Kathmandu Valley. This was constructed with Indian assistance of Rs. 120 crore and handed over to the Government of Nepal in 1999. This hospital is providing medical care to patients of not only the Eastern region but also to patients coming from all over Nepal. The institute is providing MBBS and Post Graduate courses in medical sciences thereby helping make Nepal self-reliant in the health sector. Government of India is also providing medical faculty support to the medical college by deputing expert faculty from reputed institutes of India who are teaching the students and also helping the hospital in treatment of patients and capacity development in the field of medicine and surgery. The Medical College Block in the premises of the hospital was also constructed with Indian assistance of Rs 6.86 crore. Since, 2013-14, India is also providing an annual funding of Rs. 1 crore to BPKIHS for five years towards partially covering hiring of Indian faculty for the introduction of super specialty courses by the Institute and or any other programme specifically for promoting ties/exchanges with India. It is also providing financial assistance of Rs.2.50 crore for procurement of furniture and equipment for the college.

The National Trauma Centre at Kathmandu was constructed with Indian assistance as a super speciality hospital following an MoU between the governments in 2003. It is the first of its kind in Nepal. It is built on the lines of the All India Institute of Medical Sciences in New Delhi and is fully equipped with modern medical equipments

India also established maternity and neo-natal intensive care units at Paropakar Hospital in Kathmandu.

Since 1994, India has gifted 462 ambulances to organisations across 73 districts in Nepal helping to bring health services to people who otherwise have no access to health centres. India also presented 90 school buses to various health and educational institutions to facilitate the easy movement of teachers, students, doctors and nurses.

The supply of iodised salt for controlling goitre in hilly and remote areas in Nepal, following an agreement in 1973 for distribution of iodised salt throughout Nepal in a programme costing Rs. 12 million, is an early case of cooperation in preventive health care. After the signing of a new agreement in 1982, for continuation of the project, India extended support for establishing iodisation plants at a total cost of Rs. 20 million. The programme continued till 2012, except during the period from 1999 to 2003. The 2011 contract renewed the programme across four different areas of subsidy, respectively re-iodisation, packing transportation and advocacy. The Nepalese government undertakes procurement of salt from India according to its own norms and regulations. As a result of this intervention the total goitre rate in Nepal, which was 55 per cent in 1975 fell to 0.4 per cent n 2007." (Chaturvedi 2016). So far, Rs. 43 crore assistance has been provided for the programme, besides a commitment to provide Rs. 4.3 crore for Iodine Deficiency Disorders.

India was one of the first countries to rush with medical, rehabilitation and relief aid when a 7.8 magnitude earthquake hit Kathmandu in 2015. The health specific interventions included setting up of three mobile field hospitals and dispatched 15 tons of medical supplies and also deputation of a team of orthopaedic surgeons, anaesthetists, nurses and operation theatre technicians to the areas affected by the earthquake.

Five storied OPD complex of the Bir Hospital at Kathmandu was constructed with Indian assistance in year 1984-85. It has the capacity to accommodate 2500 out-patients and is equipped with sophisticated facilities. A modern Nuclear Imaging Medicine Centre as well as other equipment for use in the OPD were also provided by Government of India, making this hospital the premier Health Care Institution in Nepal. Services of two Indian experts were also provided for a period of four years for training of medical specialist in Bir Hospital's Nephrology Department.

Box 8: Assistance to Nepal Netra Jyoti Sangh (NNJS) for Cataract and Trachoma surgeries programme

Blindness due to cataract is a major health problem in Nepal. It is estimated that there are about 3.20 lakh blind people in Nepal, including about 1.29 lakh suffering from blindness due to cataract. About 20,000 people develop cataract in one or both eyes each year. Trachoma is the second leading causes of preventable blindness in Nepal. Out of Nepal's 75 Districts, 29 Districts are affected by Trachoma. With the assistance of Government of India, Nepal Netra Jyoti Sangh (NNJS) organizes approx. 400 Diagnostic Screening & Treatment (DST) camps and surgery camp for Cataract in 52 districts and for TT in 14 Districts in the country every year. These camps provide absolutely free medical service to the patients. More than 1,02,000 patients have been cured for cataract and about 5,100 patients have been cured of Trachoma under this programme. Government of India is providing assistance of Rs. 2.10 crore to NNJS during 2014-15 for eye care programme.

School Eye Health Care Programme: Since 2007 Government of India has been providing assistance to NNJS for holding eye camps in schools in remote areas and providing free of cost 9,000 optical dispensing devices to 'Vision Impaired" children and 300 Low vision dispensing device to children in Nepal every year. India has provided a financial assistance of Rs. 2.32 crores to NNJS for its School Eye Health Care Programme. A mobile eye care van costing Rs. 13.52 lakh has also been provided to NNJS for holding eye camps in schools. A Memorandum of Understanding was signed on 17 September 2014 between the Embassy of India, Kathmandu and Nepal Netra Jyoti Sangh (NNJS) for providing Indian Grant Assistance of Rs.64 lakh to NNJS for School Eye Health Care Programme in various Districts of Nepal.

Source: Embassy of India in Kathmandu.

Several health posts, nursing campuses maternity centres, eye hospitals, naturopathy hospitals have been undertaken under our Small Development Project scheme. Infrastructure of 25 hospitals has been taken up in the country with India's assistance of Rs. 38 crore in 18 Districts.

Afghanistan

Cooperation and development partnership between Afghanistan and India go back to 1950 when a Treaty of Friendship between the two governments was signed. This continued to be restated in several agreements from time to time. The Indira Gandhi Institute of Child Health, Kabul is the main children's hospital in Afghanistan. This 400 bed hospital was t up in the 1970s with Indian assistance. Annually, around 3 lakh children get treatment in this hospital.

The decades of fighting had severely affected the medical services in Afghanistan and India has been sending doctors and para-medicos to that country since 2001. Camps for fitting artificial limbs were also conducted in different parts of Afghanistan. Five Indian Medical Missions have been working in Kabul, Herat, Jalalabad, Kandahar and Mazar-e-Sharif. These Missions cater to around 30,000 patients every month; they also provide medicines.[60]

In 2005, the two countries signed a cooperation agreement in the field of Health Care and Medical Sciences which, among others, provided for cooperation in the areas of family welfare, public health and nutrition, communicable diseases, medical research, indigenous systems of medicine, medical equipment and pharmaceutical products, hospital management and nursing and midwifery. The cooperation is

to include exchange of information in the field of health and medicine, exchange of health and medical experts, training in the mutually agreed identified areas, deputation of experts to attend international meeting held in either country, and conducting symposia, academic meetings and working meetings. The expenditure on the visits from both the countries are to be met under 'India's Assistance Programme to Afghanistan'. The cooperation programmes intensified in recent years when India has played a significant role in the rehabilitation and reconstruction of Afghanistan. It is so far the largest contributor in the process with $ 2 billion in overall financial assistance.

Apart from infrastructure it has also made its footprint in the area of healthcare projects. These include establishment of a new Diagnostic Centre in 2015 and construction of a Decentralised Waste Water Treatment System at Indira Gandhi Institute of Child Health (IGICH), commitment to contribute $ 1 million annually over next five years to Afghan Red Crescent Society for treatment of Afghan children with congenital heart disease besides grant-in-aid of $ 1 million to the IGICH over the next five years. As per the Embassy of India, Kabul website, 264 children with Congenital Heart Disease were treated till March 2016. Though it was inaugurated in 1972, the construction of the surgical block and polyclinic got interrupted due to civil war and could be resumed in 2003 only. These two are now functional. The Indian assistance also includes new lifts, HT stabiliser, EPBX system, incinerator for solid medical waste disposal, diagnostic centre with equipments such as CT Scan machine, HVAC and Gas Manifold Systems, Digital X-Ray machines, ICU equipments, OT equipment, imaging equipment, Ophthalmology equipment hospital furniture, Central Sterile and Supplies Department equipment and EPABX. The new diagnostic centre was inaugurated in September 2015. Batches of IGICH specialists also get training at the All India Institute of Medical Science, New Delhi.[61]

The Small Development Projects Scheme included in India's development partnership portfolio also includes projects on healthcare. Training *via* tele-education is provided at Indira Gandhi Institute of Child Health, Kabul.[62] These include, Setting up of Basic Health Clinics in Khas Kunar and Asmar districts of Kunar province, Jani Khel district of Paktia province, Wakhan district of Badakhshan province, Zaranj and Chakhansur districts of Nimroz province, Musa Khel district of Khost province, Arghistan district of Kandahar province, Laja Mangal and Jaja Maidan districts of Paktia province, Wama district of Nooristan province, in Balkh province, and in Kuran Wa Munjan and Wakhan districts of Badakhshan province, Comprehensive Health Centres in Warmamai district of Paktia province, Maruf district of Kandahar province, Gayan and Siruk districts of Paktika province, and Ali Sher district of Nangarhar province.[63]

India is going to take up 116 High Impact Community Development Projects in 31 provinces of Afghanistan. The areas of investments include health. Comprehensive Health clinics are set up in various provinces with Indian assistance.

India also announced that on-going programmes for education, capacity building, skills and human resource development of Afghanistan, one of the largest such programmes in the world, will continue for a further period of five years from 2017 to 2022.

The Agreement on Strategic Partnership between the Islamic Republic of Afghanistan and the Republic of India, inter alia, provides for expansion of scholarships in medical institutes of India.[64]

Bangladesh

Apart from the historical and cultural ties between the two countries, India was one of the first countries to recognise Bangladesh and establish diplomatic relations on its independence in 1971.The Treaty of Friendship, cooperation and Peace between the two countries signed in March 1972 provided for promotion of relations, inter alia, in the field of health. India's relations with Bangladesh can be judged from the fact that out of $US 24,189 million LoCs that have been

credited by GOI to other countries, $US 7,862 (32.50 per cent) went to Bangladesh. In 2016, the GOI announced LoCs to Bangladesh, worth $US 4,500 million to finance developmental projects in the country.

India and Bangladesh signed a Memorandum of Understanding on Cooperation in the Field of Traditional Systems for Medicine and Homeopathy in September, 2014 with a view to strengthen, promote and develop cooperation in the fields of traditional medicine. The areas identified for cooperation include promotion of Promotion of traditional systems of medicine, exchanging experts for training of practitioners, paramedics, scientists, teaching professionals and students, accommodating interested scientists, practitioners, paramedics and students in institutions for research, educational and training programmes, mutual recognition of systems of medicine pharmacopoeias and formularies, and of educational qualifications in each other countries, setting up of Academic Chairs, providing scholarships for education, and recognition of traditional preparations on reciprocatory basis as per the existing laws of respective countries.[65] India is already conducting Yoga courses at the High Commission of India, Dhaka.

India is also partnering with Bangladesh in undertaking various development projects, among others, in health care, funded by India. Currently there are 63 projects, including several on health, which are at various stages of implementation. The total cost of these projects is approximately BDT 1400 crore. The capacity-building projects include construction of 36 community clinics in remote areas of Bangladesh.[66]

Bhutan

With the departure of Britain from India, Bhutan and India signed a Treaty of Friendship on 8 August 1949 which provided for free trade between the two countries. The 1960s witnessed Bhutan establishing medical facilities with the establishment of the Department of Health. By 1971, there were five hospitals and 35 dispensaries (Labh 1974). Indian personnel were the main support of the campaigns for eradication of malaria, leprosy, goitre and venereal diseases.

Bhutan has always been a priority region for India, when it comes to forming development partnership through financial development assistance. The major portion of India's financial assistance to neighbouring countries goes to Bhutan (Figure 20). India granted financial assistance of worth Rs. 3,714 crore to Bhutan in the year 2017-18 alone. This amount constituted around 53.87 per cent of India's total foreign assistance budget. For the year 2015-16, 66.47 per cent of our foreign financial assistance went to Bhutan (See Table 3 for more details). Capacity building through Indian ITEC programme is also very popular in Bhutan. In the year 2017 alone, 321 ITEC scholarships were awarded to Bhutanese nationals.[67]

All drug procurement and dissemination of drugs in Bhutan is done by the government. Consequently all the drugs in Bhutan are provided free of cost (Holloway, 2011). The pharmaceuticals manufacturing sector in Bhutan doesn't meet the domestic requirements of the country, hence a major proportion of these drugs are imported. As, per the latest data available, Bhutan is heavily dependent on India to meet its need of pharmaceuticals. As per 2012, India exported US$ 5.1 million worth of pharmaceutical products to Bhutan. For this year, imports of pharmaceuticals from India comprised of 90% of total pharmaceutical imports in Bhutan. Bhutan also imported pharmaceutical products from few other countries, namely Denmark, Bangladesh, USA and others, but all of them constituted a small amount of total imports of pharmaceuticals in Bhutan, when compared to India (See figure 22).

Sri Lanka

India and Sri Lanka have a long historical relationship with common legacies of intellectual, cultural, religious and linguistic intercourse. Sri Lanka is India's largest trade partner in SAARC and India is Sri Lanka's largest trade

Figure 22: Country wise imports of Pharmaceutical products by Bhutan, 2012

Source: WITS Comtrade Database.

partner globally, with a total trade value of $ 4602 million in 2014.Incidentally, 3.74 per cent of Sri Lankan exports to India in the year 2014 was of medicaments. India is also a major foreign investor in Sri Lanka.

India-Sri Lanka cooperation in health care sector has strengthened in recent years. At the request of the Government of Sri Lanka, India had assisted Sri Lanka with a grant of $ 7.56 million in the 1990 Suwaseriya Emergency Ambulance Service launched in 2016.[68] This grant included purchase of 88 ambulances, operational expenditure of the service for one year and setting up of an emergency response centre. The initial launch was in the Western and Southern Provinces only and it proved to be a success. Thereupon the Government of Sri Lanka made a request to India to expand the same country-wide. This was agreed to in 2017 with an additional grant of $ 15.02 million covering the cost of 209 ambulances, training costs and operational expenditure for one year in all the seven provinces. This is the largest Indian grant project in Sri Lanka after the Indian Housing Project.

A District Base Hospital in Dickoya was constructed under Indian grant. India has also provided grants for construction of a hospital in Vavuniya and provide medical equipments to hospitals in Jaffna, Kilinochchi and Mullaithivu. The south Asian satellite launched by India in May 2017 provides services in tele-medicine and tele-education to Sri Lanka also.[69] India also meets approximately 60-70 per cent of Sri Lanka's pharma requirements.

India and Sri Lanka also signed an MoU for cooperation in the areas of traditional medicine and homeopathy in 2018. The aims of the agreement are to establish the exchange and accommodation of experts in the fields of homoeopathy and traditional medicines in institutions for research, educational and training programmes. These experts will be used in the training of practitioners, paramedics, scientists, teaching professionals and students in both countries. Mutual recognition of officially recognised systems of medicine, educational qualifications in traditional systems of medicine and homeopathy, pharmacopoeias and formularies and Setting up of academic chairs on

traditional systems of medicine and homeopathy are also objectives of the MoU.[70]

The agreement also includes the standardisation and mutual recognition of homoeopathic practices and qualifications between the two nations. This also includes the regulation of teaching, practice, drugs and drugless therapies as well as the appointment of academic chairs within both countries.

Maldives

India had established the Indira Gandhi Memorial Hospital (IGMH) in Male in April 1995. The IGMH is the most easily visible symbol of India's assistance to the Maldives. In 2010, the Indian healthcare major, Apollo hospitals, entered into an agreement with the Republic of Maldives to run and manage IGMH for next 20 years. In November 2011, a MoU was signed through which India were to carry out major renovation works of the hospital. Today, IGMH, with its state-of-the-art facilities, is the premier institute in Maldives providing health care services to its citizens.[71]

The countries of South Asia have populations that share many genetic traits and also have many common disease burdens. Further, climatic features are also shared by many of them and vector-borne diseases can spread easily from one country to the other through common borders. Partnerships in health care among them can really boost heath indicators in these countries and that will push global health profile.

Chapter V

Conclusion

The world community is devoting serious attention than hitherto to ensure healthy lives and promote well being for all at all ages by 2030. For one, health is fundamental to economic development since diseases take away valuable productivity and also a basic condition for well-being and a happy life. However, the challenges vary from country to country and international cooperation is a must for tackling the problems. South-South Cooperation is to be considered as an effective and economical way to address the health problems, especially because of similarities of circumstances and experience of the countries involved. In his report to the General Assembly in September 2018 on the role of SSC in the implementation of the SDG agenda, the Secretary General of UN has identified health as a sector in which SSC allows countries to play an important role as facilitators of cooperation.[72] India has been in the forefront in extending such cooperation and working with other partners. Many lessons have been learnt from these which can be effectively used for furthering the partnerships. There have also been experiences of other partners lessons from which also can be considered learning tools. Besides, challenges also keep changing and partners will have to tune their approaches to new developments.

In the case of health care, as already brought out in this report, monitoring and data collection are two major challenges for most developing countries. The advancements in digital technologies around the world should now make this process much easier than in the past, but one which makes cooperation a must. Countries with advanced technologies and methodologies of statistics collection and monitoring could be of great help to others. India could be considered a possible partner in this effort for Africa and other countries.

The SDG Agenda has decided upon certain indicators for monitoring each SDG target. In sectors like health, universal indicators may not apply to every country. These have to be country and province specific depending on the health challenges in each province. Further, it will be an on-going exercise depending on the state of achievement from time to time. SSC partnerships can be highly effective in this area. SSC can support national capacities in identifying and monitoring health care indicators. At the same time, financing may have to a broader approach than target or indicator specific one, since heath cannot be limited to any specific target of indicator.

An area in which SSC is a must is in medical and pharmaceutical R&D. These research programmes will have to address the diseases that pose major challenges to the South and on which large pharmaceutical firms will have less of an interest in view of the prospects of economic return not being very high. As mentioned above, cooperative research can reduce the cost factor too. Clinical trials specifically can attract much cooperative partnerships, both in public and private sectors

Similarly, development of local capacity in medical education is a challenge for several developing countries. Cooperation in this area can be in building up the infrastructure, deputing faculty, providing equipments and facilitating preparation of locally relevant course material in the language medium used locally. Electronic

facilities can be very well deployed for this. There can be e-learning centres as in India's e-health programme in Africa where facilities are provided through the Pan Africa e-Network.

When it comes to public health, the South is facing the general problem of access to affordable medicines and medical devices. Intellectual Property Rights in pharmaceutical products stand in the way of access in many countries as they inhibit and some time prohibit local manufacturing and procurement from the most economical market. The TRIPS regime as such has enough constraints and to add that there are attempts to insert TRIPS Plus provisions in many regional and bilateral trade and investment treaties. IPR protection regimes should balance the interests of the public, especially public health and the private rights of the IPR owners, as provided in Articles 7 and 8 of the TRIPS Agreement. The South should enhance their cooperation and partnerships in this area and try to bring in a balanced international IP regime. This kind of harmonisation and cooperation can enhance trade and commerce in pharmaceuticals.

Coupled with this is the harmonisation of pharmaceutical standards among countries of the South. This would facilitate and encourage both research and development and trade in pharmaceuticals among these countries. They will also go a long way in assuring of quality of pharmaceutical products from each other.

Another area where productive cooperation can be is that of Traditional Medicine. The South has wonderful resources and capacities in this area, which have not received deserving international recognition. In the context of sustainability, traditional medicines are very good alternative systems and ought to be used better than hitherto. They also provide excellent clues for innovative research for finding out better cures many modern diseases and for general well-being.

Perhaps, it is worth recalling some of the resolutions made in the Fifth Conference of Heads of State or Government of Non-Aligned Countries in Colombo on 16-19 August, 1976 since they are still valid for cooperation among the south on Health. They include, *inter alia*,

a) *The preparation of a list of priority pharmaceutical needs of each developing country and the formulation of a basic model list of such needs as a general guideline for action by the developing countries;*
b) *The establishment of a national buying agency to undertake the purchase and supply of pharmaceuticals;*
c) ... ;
d) *The elimination, wherever possible, of brand names and the adoption of the generic names for pharmaceuticals; and provision of information only from official sources;*
e) *The establishment by each developing country of its own pharmaceutical; industry as appropriate, beginning with formulation and packaging and building u to more complex production activities.*[71]

These recommendations are all the more relevant even now and SSC partnerships in health care can and should take note of the same. They could guide and shape future cooperation in this area.

We have already in Chapter III identified a large number of areas and specific steps for healthcare co-operation between Africa and India. Those recommendations are generally applicable to health care partnerships among all countries of the South. There are also more such areas for cooperation.

A common problem in most countries of the South is the low level of health education among the common people. This lack of awareness is one of the reasons for the low level of preventive health care such as hygiene in many of these countries. This is one important field in which SSC can be economical and very effective owing to commonality of challenges and circumstances among the partners.

The divergence of the countries in the levels of health care necessitates co-operation across the entire spectrum of health care needs from preventive health care, basic needs and high end medical technologies. At the same time, the South itself has capabilities across in all bands of the spectrum and that makes SSC in health care a viable option. That is the beauty of SSC.

Endnotes

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15 Following the conclusion of the MDGs, the UN adopted a new set of development goals referred to as Sustainable Development Goals, which are to be achieved by 2013. There are 17 goals which are: 1. End poverty in all its forms everywhere, 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture, 3. Ensure healthy lives and promote well-being for all at all ages, 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all, 5. Achieve gender equality and empower all women and girls, 6. Ensure availability and sustainable management of water and sanitation for all, 7. Ensure access to affordable, reliable, sustainable and modern energy for all, 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all, 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation, 10. Reduce inequality within and among countries, 11. Make cities and human settlements inclusive, safe, resilient and sustainable, 12. Ensure sustainable consumption and production patterns, 13. Take urgent action to combat climate change and its impacts, 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development, 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably

manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss, 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels, and 17. Strength the means of implementation and revitalize the global partnership for sustainable development. Specific targets have also been laid down for every target.

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Annexures

Table A1: Health expenditure in African and Selected South Asian Countries

Country	Current health expenditure (% of GDP)		Out-of-pocket expenditure (% of current health expenditure)	
	2000	2015	2000	2015
Algeria	3.49	7.06	25.79	28.10
Angola	2.50	2.95	25.01	33.39
Botswana	5.82	5.97	11.20	5.26
Burundi	6.76	8.24	45.68	19.07
Cameroon	4.32	5.11	77.43	69.74
Cape Verde	4.85	4.85	25.26	23.17
Central African Republic	3.51	4.78	56.53	39.60
Chad	6.17	4.58	56.27	56.37
Comoros	12.12	8.05	82.13	74.81
Congo Republic	1.69	3.43	52.70	43.84
Congo Dem Republic	1.44	4.27	55.03	37.43
Benin	4.27	3.99	51.98	40.50
Equatorial Guinea	2.51	2.70	75.61	71.98
Ethiopia	4.40	4.05	35.96	37.81
Eritrea	5.64	3.32	50.42	52.38
Djibouti	4.13	4.39	51.33	20.38
Gabon	2.90	2.68	49.93	25.90
Gambia	3.62	6.75	35.32	20.31
Ghana	5.10	5.91	64.16	36.11
Guinea	4.99	4.54	53.97	54.49
Cote d'Ivoire	5.67	5.44	58.50	36.02
Kenya	5.25	5.22	46.83	33.37
Lesotho	5.78	8.36	35.39	16.85
Liberia	3.82	15.19	47.49	19.64
Libyan Arab Jamahiriya	3.43		51.29	
Madagascar	5.35	5.24	36.15	21.66
Malawi	4.35	9.33	11.99	10.98
Mali	5.10	5.80	73.72	46.31
Mauritania	4.46	4.64	81.03	48.24
Mauritius	3.02	5.54	44.00	50.67
Morocco	3.98	5.53	54.12	53.08
Mozambique	3.71	5.35	17.37	6.85
Namibia	11.54	8.93	3.02	8.33
Niger	5.65	7.17	64.18	52.27
Nigeria	2.64	3.56	72.93	72.24

Table A1 Continuing

Country	Current health expenditure (% of GDP)		Out-of-pocket expenditure (% of current health expenditure)	
Guinea-Bissau	6.29	6.88	38.44	37.16
Rwanda	4.63	7.90	24.46	25.97
Sao Tome and Principe	9.74	9.84	27.31	11.67
Senegal	4.63	3.97	54.09	44.18
Seychelles	4.61	3.39	17.89	2.48
Sierra Leone	9.89	18.32	58.64	38.24
Somalia				
South Africa	7.44	8.20	15.12	7.70
Zimbabwe		10.32		25.79
South Sudan		2.53		61.35
Sudan	3.62	6.31	61.82	63.23
Swaziland	4.61	7.04	18.53	11.31
Togo	3.76	6.65	75.58	50.96
Tunisia	5.05	6.74	38.63	39.78
Uganda	7.95	7.30	37.68	40.50
Egypt	5.18	4.17	62.49	61.96
Tanzania		6.12	37.69	26.15
Burkina Faso	3.32	5.45	42.16	36.11
Zambia	7.92	5.35	26.59	27.53
Sub-Saharan Africa	5.20	5.34	32.67	36.25
Middle East & North Africa	4.71	5.46	38.22	30.82
Afghanistan		10.29		78.38
Bangladesh	2.40	2.64	61.10	71.82
Bhutan	4.19	3.49	11.25	19.79
Nepal	4.14	2.97	55.78	60.41
Sri Lanka	3.57	6.15	26.98	38.43
India	4.18	3.89	71.70	65.06
World	8.60	9.90	19.21	18.15

Source: World Development Indicators.

Table A2: General Health of Population in African and Selected South-Asian Countries

Country	Life Expectancy at Birth in Years	Maternal Mortality Ratio (per 100 000 live births)	Infant Mortality Rate (per 1000 live birth)
	2015	2010-2018	2017
Cape Verde	72.80	42	15.00
Egypt	71.48	33	18.80
Sao Tome and Principe	66.62	156	25.20
Morocco	75.82	121	20.00
Botswana	66.80	129	30.80
Comoros	63.70	335	52.20
South Africa	62.77	138	28.80
Sudan	64.49	311	43.70
Rwanda	67.13	290	28.90
Equatorial Guinea	57.68	342	65.30
Gabon	66.11	291	35.10
Burkina Faso	60.36	371	51.20
Benin	60.91	405	63.50
Namibia	64.39	265	31.80
Kenya	67.03	510	33.60
Mali	57.97	587	65.80
Djibouti	62.47	229	51.50
Zambia	61.87	224	41.50
Togo	60.23	368	49.20
Congo	64.63	442	34.70
Senegal	67.15	315	32.70
Uganda	59.89	343	35.40
Gambia	61.19	706	41.40
Mozambique	58.31	489	53.30
Madagascar	65.93	353	32.70
Eritrea	65.09	501	32.10
Burundi	57.48	712	42.50
Tanzania	65.68	398	38.30
Niger	60.06	553	48.30
Malawi	63.22	634	38.50
Nigeria	53.43	814	64.60
Cote d'Ivoire	53.58	645	64.20
Mauritania	63.24	602	53.30
Zimbabwe	61.16	443	36.50
Ethiopia	65.48	353	41.00
Guinea	60.02	679	56.40
Cameroon	58.07	596	55.10

Table A2 Continuing

Country	Life Expectancy at Birth in Years	Maternal Mortality Ratio (per 100 000 live births)	Infant Mortality Rate (per 1000 live birth)
	2015	2010-2018	2017
Congo	59.62	442	70.00
Chad	52.90	856	73.40
Guinea-Bissau	57.40	549	55.60
Lesotho	54.17	487	66.50
Liberia	62.51	725	55.90
Sierra Leone	51.84	360	81.70
Central African Republic	52.17	882	87.60
Somalia	56.29	732	79.70
South Sudan	56.81	789	62.50
Swaziland	57.75	389	40.80
Angola	61.55	477	53.80
Ghana	62.74	319	35.70
Libyan Arab Jamahiriya	71.93	9	10.60
Seychelles	74.31		12.20
Mauritius	74.39	53	11.60
Tunisia	75.73	62	11.20
Algeria	76.08	140	20.60
Sub-Saharan Africa	60.39		51.50
Middle East & North Africa	73.49	110	19.30
Africa		542	
Afghanistan	63.67	1291	51.50
Bangladesh	72.49	210	26.90
Bhutan	70.20	86	25.60
Nepal	70.25		27.80
Sri Lanka	75.28	31.1	7.50
India	68.56	170	32.00
World	72.04	210	29.40

Source: World Development Indicators Database.

Table A3: Burden of Communicable Diseases in African and Selected South-Asian Countries

Country	Prevalence of HIV total (% of population 15-49)	Incidence of tuberculosis (per 100,000 people)	Incidence of malaria (per 1,000 population at risk)
	2017	2017	2017
Algeria	0.10	70	
Angola	1.90	359	154.97
Botswana	22.80	300	1.97
Burundi	1.10	114	194.50
Cameroon	3.70	194	303.80
Cape Verde	0.60	134	2.98
Central African Republic	4.00	423	387.32
Chad	1.30	154	188.61
Comoros	0.10	35	3.97
Congo Republic	3.10	376	197.63
Congo Dem Republic	0.70	322	307.62
Benin	1.00	58	367.91
Equatorial Guinea	6.50	191	343.26
Ethiopia	0.90	164	37.37
Eritrea	0.60	67	22.87
Djibouti	1.30	269	0.03
Gabon	4.20	529	168.87
Gambia	1.60	174	56.67
Ghana	1.70	152	270.69
Guinea	1.50	176	336.72
Cote d'Ivoire	2.80	148	138.86
Kenya	4.80	319	70.83
Lesotho	23.80	665	
Liberia	1.40	308	192.59
Libyan Arab Jamahiriya	0.00	40	
Madagascar	0.30	238	90.90
Malawi	9.60	131	231.10
Mali	1.20	55	386.16
Mauritania	0.30	97	53.91
Mauritius		12	
Morocco	0.10	99	
Mozambique	12.50	551	337.92
Namibia	12.10	423	44.56
Niger	0.30	90	358.65
Nigeria	2.80	219	281.15
Guinea-Bissau	3.40	374	58.01
Rwanda	2.70	57	505.57

Table A3 Continuing.

Country	Prevalence of HIV total (% of population 15-49)	Incidence of tuberculosis (per 100,000 people)	Incidence of malaria (per 1,000 population at risk)
	2017	2017	2017
Sao Tome and Principe	0.00	118	10.96
Senegal	0.40	122	64.62
Seychelles		19	
Sierra Leone	1.40	301	379.71
Somalia	0.10	266	36.75
South Africa	18.80	567	3.97
Zimbabwe	13.30	221	95.22
South Sudan	2.40	146	141.68
Sudan	0.20	77	37.45
Swaziland	27.40	308	1.89
Togo	2.10	41	370.86
Tunisia	0.10	34	
Uganda	5.90	201	200.66
Egypt	0.10	13	
Tanzania	4.50	269	113.03
Burkina Faso	0.80	49	411.99
Zambia	11.50	361	203.32
Sub-Saharan Africa	4.12	237	209.53
Middle East & North Africa		31	
Afghanistan		189	23.01
Bangladesh	0.10	221	1.86
Bhutan		134	0.02
Nepal	0.20	152	0.45
Sri Lanka	0.10	64	0.00
India	0.20	204	7.66
World	0.80	133	59.12

Table A4: Distribution of Mortality in Africa and World, 2016

	Global				WHO African Region			
Population	**7,461,884**				**1,019,920**			
Cause of Death	**Deaths (000s)**	**% of total deaths**	**CDR***	**ASDR****	**Deaths (000s)**	**% of total deaths**	**CDR***	**ASDR****
All Causes	56,874	100.0	762.2	726.0	8,845	100.0	867.2	1,291.5
Communicable, maternal, prenatal and nutritional conditions	**11,445**	**20.1**	***153.4***	***148.8***	**4,952**	**56.0**	***485.5***	***548.3***
Tuberculosis	1,293	2.3	17.3	16.9	405	4.6	39.8	71.0
STDs excluding HIV	102	0.2	1.4	1.3	63	0.7	6.1	3.8
HIV/AIDS	1,012	1.8	13.6	13.6	719	8.1	70.5	93.3
Diarrhoeal diseases	1,383	2.4	18.5	17.9	653	7.4	64.0	87.7
Hepatitis	162	0.3	2.2	2.1	31	0.4	3.1	4.4
Malaria	446	0.8	6.0	5.9	408	4.6	40.0	31.1
Respiratory Infectious	2,964	5.2	39.7	37.6	919	10.4	90.1	119.8
Maternal conditions	298	0.5	4.0	4.0	194	2.2	19.0	21.4
Neonatal conditions	2,239	3.9	30.0	29.2	883	10.0	86.6	47.5
Nutritional deficiencies	453	0.8	6.1	5.8	227	2.6	22.3	23.7
Non-communicable diseases	40,545	71.3	543.4	512.7	3,024	34.2	296.5	635.2
Mental/Substance use disorders	315	0.6	4.2	4.2	26	0.3	2.6	4.0
Depressive disorders	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Bipolar disorder	1	0.0	0.0	0.0	0	0.0	0.0	0.0
Schizophrenia	5	0.0	0.1	0.1	0	0.0	0.0	0.0
Alcohol use disorders	146	0.3	2.0	1.9	12	0.1	1.1	2.0
Drug use disorders	160	0.3	2.1	2.1	14	0.2	1.4	1.9
Cardiovascular diseases	17,858	31.4	239.3	224.5	1,151	13.0	112.8	283.8
Respiratory diseases	3,808	6.7	51.0	47.9	185	2.1	18.1	43.0
Digestive diseases	2,530	4.5	33.9	32.6	356	4.0	34.9	66.9
Injuries	4,883	8.6	65.4	64.4	870	9.8	85.3	108.1
Unintentional injuries	3,429	6.0	46.0	45.0	674	7.6	66.0	83.1
Intentional injuries	1,454	2.6	19.5	19.4	196	2.2	19.2	25.0

*CDR: Crude Death Rate per 100 000 population
**ASDR: Age Specific Death Rate per 100 000 population
Source: Global Health Estimates 2016: Estimated deaths by cause and region.

Table A5: Immunization Coverage in African and Selected South Asian Countries, 2016

Country	BCG Immunization Coverage	Hepatitis B (HepB3) immunization coverage	Measles-containing-vaccine first-dose (MCV1) immunization coverage	Polio (Pol3) immunization coverage
	2016	2016	2016	2016
Algeria	99	91	94	91
Angola	58	55	45	53
Botswana	98	95	97	96
Burundi	93	94	93	94
Cameroon	70	85	78	83
Cape Verde	96	96	93	95
Central African Republic	74	47	49	47
Chad	59	41	37	44
Comoros	94	91	90	92
Congo Republic	80	71	67	71
Congo Dem Republic	80	71	67	71
Benin	96	82	74	78
Equatorial Guinea	59	19	30	20
Ethiopia	83	73	66	74
Eritrea	97	95	99	95
Djibouti	90	68	75	68
Gabon	94	75	64	74
Gambia	98	95	97	95
Ghana	94	93	89	95
Guinea	72	45	48	45
Cote d'Ivoire	95	82	74	71
Kenya	99	89	96	88
Lesotho	98	93	90	90
Liberia	97	79	80	79
Libyan Arab Jamahiriya	99	97	97	97
Madagascar	70	77	58	75
Malawi	86	84	81	83
Mali	73	66	61	62
Mauritania	86	74	72	73
Mauritius	98	72	92	96
Morocco	99	99	99	99
Mozambique	95	80	85	80
Namibia	89	85	75	84
Niger	91	80	76	80
Nigeria	53	42	42	40

Table A5 Continuing.

Country	BCG Immunization Coverage	Hepatitis B (HepB3) immunization coverage	Measles-containing-vaccine first-dose (MCV1) immunization coverage	Polio (Pol3) immunization coverage
	2016	2016	2016	2016
Guinea-Bissau	94	87	81	87
Rwanda	99	98	95	99
Sao Tome and Principe	92	96	93	96
Senegal	97	93	93	92
Seychelles	99	97	97	96
Sierra Leone	92	84	85	84
Somalia	37	42	46	47
South Africa	74	66	75	66
Zimbabwe	95	90	95	90
South Sudan	37	26	20	31
Sudan	96	93	86	93
Swaziland	97	90	89	90
Togo	79	89	87	89
Tunisia	95	98	96	98
Uganda	96	85	80	80
Egypt	96	95	95	95
Tanzania	99	97	90	93
Burkina Faso	98	91	88	91
Zambia	99	91	93	87
Africa	79	72	70	70
Afghanistan	74	65	62	60
Bangladesh	99	97	94	97
Bhutan	99	98	97	97
Nepal	93	87	83	85
Sri Lanka	99	99	99	99
India	89	88	88	86
World	88	84	85	84

Note: All data in coverage among 1 year old (%)
Source: Global Health Repository, World Health Organisation.

Table A6: Africa's Import of Pharmaceutical Products: major partners, growth rate and Year-on-Year changes from 2007-17

Year	World	India			France			Germany			Switzerland			United States		
	Value	Value	Share	Y-o-Y	Value	Share	Y-o-Y	Value	Share	Y-o-Y	Value	Share	Y-o-Y	Value	Share	Y-o-Y
2007	3073.87	134.12	4.36		755.00	24.56		262.81	8.55		280.72	9.13		173.34	5.64	
2008	6736.43	729.31	10.83	444%	1635.73	24.28	117%	520.20	7.72	98%	525.18	7.80	87%	365.61	5.43	111%
2009	7534.22	819.74	10.88	12%	1517.43	20.14	-7%	590.88	7.84	14%	568.58	7.55	8%	554.89	7.36	52%
2010	8579.51	1078.93	12.58	32%	1783.01	20.78	18%	684.27	7.98	16%	605.54	7.06	7%	766.77	8.94	38%
2011	9182.73	1063.97	11.59	-1%	1774.36	19.32	0%	924.76	10.07	35%	737.30	8.03	22%	680.78	7.41	-11%
2012	10529.05	1369.91	13.01	29%	1855.04	17.62	5%	1322.72	12.56	43%	775.98	7.37	5%	654.90	6.22	-4%
2013	12068.66	1969.21	16.32	44%	2050.53	16.99	11%	1561.06	12.93	18%	767.19	6.36	-1%	713.10	5.91	9%
2014	12239.24	2026.13	16.55	3%	2151.22	17.58	5%	1574.43	12.86	1%	750.57	6.13	-2%	671.80	5.49	-6%
2015	12632.21	2166.37	17.15	7%	1987.79	15.74	-8%	1729.68	13.69	10%	722.01	5.72	-4%	838.23	6.64	25%
2016	11776.35	2159.07	18.33	0%	1991.09	16.91	0%	1638.25	13.91	-5%	694.16	5.89	-4%	755.81	6.42	-10%
2017	12837.72	2466.77	19.22	14%	2279.17	17.75	14%	1617.96	12.60	-1%	818.08	6.37	18%	611.27	4.76	-19%
CAGR	15%	34%			12%			20%			11%			13%		

Source: WITS online Database.

Table A7: Africa's Top 10 Importing Partner for Pharmaceuticals as per Year 2017 (USD Million)

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
India	134.12	729.31	819.74	1078.93	1063.97	1369.91	1969.21	2026.13	2166.37	2159.07	2466.77
France	755.00	1635.73	1517.43	1783.01	1774.36	1855.04	2050.53	2151.22	1987.79	1991.09	2279.17
Germany	262.81	520.20	590.88	684.27	924.76	1322.72	1561.06	1574.43	1729.68	1638.25	1617.96
Switzerland	280.72	525.18	568.58	605.54	737.30	775.98	767.19	750.57	722.01	694.16	818.08
United States	173.34	365.61	554.89	766.77	680.78	654.90	713.10	671.80	838.23	755.81	611.27
China	30.85	134.49	203.42	212.13	246.53	323.36	384.47	388.16	359.13	440.63	464.13
Italy	168.74	265.53	312.69	357.21	385.74	395.83	404.29	407.89	458.69	467.53	459.49
Belgium	56.87	218.52	191.04	254.09	272.90	315.38	452.34	510.05	441.42	478.63	420.73
United Kingdom	243.78	357.43	335.79	388.65	449.40	452.78	433.35	483.62	387.95	306.50	372.56
Denmark	88.85	298.45	388.41	295.57	393.49	508.76	511.92	425.32	394.22	315.08	356.61
World	3073.87	6736.43	7534.22	8579.51	9182.73	10529.05	12068.66	12239.24	12632.21	11776.35	12837.72

Source: WITS online Database

Table A8: India's Exports of Pharmaceutical Products to African & Selected South Asian Countries for 2010-17

Country	Exports of Pharmaceutical Products from India (Million USD)			
	2010	2015	2017	Total (2010-17)
Algeria	24.54	57.72	61.81	375.55
Angola	27.69	35.24	47.64	367.92
Botswana	18.54	26.89	31.86	215.21
Burundi	9.83	13.27	20.91	102.37
Cameroon	21.77	63.96	46.80	334.46
Cape Verde	0.13	0.15	0.36	2.29
Central African Republic	1.12	7.17	9.73	42.72
Chad	7.26	20.34	14.36	130.55
Comoros	0.35	0.14	0.52	2.30
Congo	43.51	29.53	21.88	308.30
Congo	1.71	77.34	82.59	392.28
Benin	41.84	31.10	23.90	305.06
Equatorial Guinea	0.27	1.41	0.93	9.11
Ethiopia	67.07	112.81	110.75	821.15
Eritrea	2.39	2.88	2.16	25.17
Djibouti	13.48	1.44	2.90	35.16
Gabon	1.87	2.26	2.48	26.02
Gambia	1.93	3.17	4.27	25.44
Ghana	122.28	138.57	106.10	1137.56
Guinea	13.44	40.50	46.94	257.31
Cote d'Ivoire	5.81	24.35	42.86	176.52
Kenya	155.75	295.03	206.77	1877.18
Lesotho	9.68	22.17	14.95	118.66
Liberia	6.67	10.85	10.97	72.61
Libyan Arab Jamahiriya	2.92	13.28	15.05	87.99
Madagascar	9.44	18.11	15.65	114.86
Malawi	29.58	78.37	106.14	584.36
Mali	13.04	20.61	26.92	166.73
Mauritania	1.96	4.29	5.71	38.47
Mauritius	31.60	30.20	27.66	245.75
Morocco	8.71	27.71	26.27	160.56
Mozambique	43.23	128.85	89.74	626.27
Namibia	15.16	23.38	19.88	171.52
Niger	15.48	17.98	17.58	155.52
Nigeria	177.56	389.71	376.82	2592.15
Guinea-Bissau	0.65	1.17	1.43	8.90
Rwanda	16.22	26.04	31.83	186.07
Sao Tome and Principe	0.07	0.11	0.11	0.64

Table A8 Continuing.

Country	Exports of Pharmaceutical Products from India (Million USD)			
	2010	2015	2017	Total (2010-17)
Senegal	7.12	11.23	13.64	91.08
Seychelles	1.14	1.96	2.10	15.37
Sierra Leone	9.39	16.31	18.98	101.79
Somalia	3.65	9.57	12.30	64.35
South Africa	253.95	491.24	494.72	3264.75
Zimbabwe	34.06	106.45	96.72	595.50
South Sudan	0.00	0.00	0.10	0.96
Sudan	28.02	0.00	0.00	63.72
Swaziland	11.58	25.34	18.65	129.21
Togo	7.77	14.74	12.12	105.84
Tunisia	0.74	5.09	5.70	26.19
Uganda	75.57	157.67	141.29	1028.79
Egypt	7.68	47.44	26.63	195.74
Tanzania	74.20	164.43	232.12	1194.01
Burkina Faso	13.59	29.83	31.98	215.14
Zambia	40.39	104.53	86.18	658.07
Africa	1531.70	2906.59	2785.86	19658.95
Afghanistan	30.76	44.68	78.69	410.60
Bangladesh	22.32	23.73	31.55	267.51
Bhutan	0.37	2.02	2.39	8.73
Nepal	69.92	128.41	190.53	1064.67
Sri Lanka	114.57	182.83	195.63	1277.01
World	6096.13	12544.72	12884.85	85825.97

Notes: Values are in USD Million
Source: WITS Online Database

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