



Accelerating Universal Health Coverage through Technologies

Introduction

The world community has set the ambitious goal of achieving Universal Health Coverage (UHC) by 2030.¹ The issue is multi-dimensional; it varies from country to country and from region to region. There are issues of quality, affordability and accessibility. Most advanced countries have been able to provide primary health care universally, but have to address issues of non-communicable diseases (NCDs), mental disorders and geriatric syndromes. Many developing countries are still working on means of controlling communicable diseases and ensuring access even to primary health for all. Some countries like India are faced with problems of both communicable and non-communicable diseases. Issues of access vary across countries; some do not have adequate access to health care while the challenge for some others is in ensuring access to newer technologies and specialised care facilities in healthcare. In some countries affordability is a major issue while in some other countries providing

quality health care is the problem. Newer issues are also emerging in health care with increasing Anti-Microbial Resistance (AMR), problems, of an aging population and healthcare of migrants and shifting populations. The principal challenge for the international community is how to effectively use the new technologies in making quality health care affordable and accessible to all. The ultimate challenge is to “ensure healthy lives and promote wellbeing for all at all ages” (SDG 3).² The world has to ensure that all people, irrespective of gender, community, place of residence, nationality and income level, have access to the health services they need, when and where they need them, and without financial hardship.³ This Brief will explore various issues relating to technologies and affordable access to quality health care for all including the issue of existing inequalities in healthcare and how technology can mitigate disparities and gaps. It also looks into what the G20 group can do in this regard.

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¹ Goal 3 of 17 Sustainable Development Goals in the resolution, *Transforming Our World: the 2030 Agenda for Sustainable Development*, which was adopted at the United Nations Sustainable Development Summit in New York in September 2015

² *Ibid.*

³ https://www.who.int/health-topics/universal-health-coverage#tab=tab_1.

⁴ World Health Statistics 2000. P. 3.

⁵ <https://data.worldbank.org/>

⁶ *Ibid.*

⁷ World Health Statistics 2000. P. 4

⁸ Declaration of Alma-Ata International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978. Devel159-61.

⁹ WHO. *Progressing Primary Health Care: A Series of Country Case Studies*. 2018. WHO/HIS/SDS/2018.17.

¹⁰ www.who.int/health-topics/universal-health-coverage#tab=tab_1.

¹¹ <https://www.worldometers.info/demographics/life-expectancy/>

¹² Alfred Lord Tennyson. *In Memoriam*. Section LXXIII.

UHC Status

In regard to access and affordability, the world still has to catch up much. According to World Health Organisation (WHO), over 40 per cent of countries have fewer than 10 medical doctors per 10,000 population, over 55 per cent have fewer than 40 nursing and midwifery personnel per 10,000 people, over 68 per cent have fewer than five dentists per 10,000 people and over 65 per cent have less than five pharmacists per 10,000 population.⁴ The World Bank data indicates that the world has 1.566 physicians per 1,000 persons (2017).⁵ With regard to hospital beds, the number is 2.704 per 1,000 persons (2011).⁶ These average numbers do not present the realistic picture since they are based on total numbers of all countries. Most developing and least developed countries fare much poorly.

Same is the case with affordability. Almost 3 per cent of people were spending more than 25 per cent of household income on healthcare, and more than 12.7 per cent spending more than 10 per cent in 2015.⁷ WHO points out that 87 per cent of people suffering large out of pocket expenditure were living in middle income countries.

The world opted for primary healthcare as the centre of UHC programmes in 1978 through the Declaration of Alma-Ata International Conference on Primary Health Care.⁸ Countries have since then been framing policies and strategies for “building, strengthening or realigning the systems that contribute to a more expansive notion of health for the entire population.”⁹ However, while progress has been made during the last four decades or so, the objective has not yet been achieved, since Target 3.8 of

Sustainable Development Goal (SDG) 2030, announced in 2015, is about achieving UHC, “including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.” However, as per WHO, to achieve this target, at least 1 billion more people will need to have access to essential health services in each five-year period during the 15 years of the SDG.¹⁰ Life expectancy is a good indicator of healthcare in a country. While the global average life expectancy at birth for both sexes combined is 73.2 years in 2020, 80 countries, including three G20 countries viz., Russia, India and South Africa, have less than that.¹¹ This shows the enormity of the challenge that the world is facing. As the poet Tennyson wrote, “So much to do, so little done, such things to be.”¹²

UHC and Covid-19

COVID-19 pandemic has further accentuated the issues. During the epidemic all areas of healthcare, which include access and affordability also, suffered in almost all countries, irrespective of whether they are developed or developing. The efforts of all countries to ensure UHC have been thrown into disarray by the COVID-19 pandemic. The systems in most developed and developing countries have collapsed under the weight of the epidemic as it threw up unprecedented challenges for policy makers, healthcare establishment, healthcare workers and general population. Many countries who were on track for achieving UHC find that their efforts have de-railed consequent on lockdowns, diversion of the system to handle COVID-19 cases, huge burden on health care workers and so on. World

Economic Forum *Covid Action Platform Report*¹³ concludes that inoculation of 8 crore of children below age one was affected by the epidemic. Disruptions of vaccinations may lead to spread of certain diseases in the future. The economic depression caused by the pandemic may also affect provisions for healthcare. The COVID –19 has thus thrown up an unprecedented challenge to achievement of UHC. The way forward for meeting this enormous task appears to be one of intense and accelerated application of technologies than is happening now across countries.

Technology and Healthcare

Healthcare is a field with heavy footfalls of technology, both in products and in service too. It starts with diagnosis, which is now almost entirely technology driven, to medicines and physiotherapy. Healthcare technology has emerged as a separate branch of technology, which, according to WHO “is the application of organised knowledge and skills in the form of devices, medicines, vaccines, procedures and systems developed to solve a health problem and improve quality of lives.”¹⁴ Health professionals like doctors, nurses and public health workers and also ordinary persons are using health technology these days. While professionals like doctors, surgeons and laboratory technicians may use high end technologies, patients and ordinary people use devices to measure their temperatures or blood pressure and such simple technologies. The new technologies have made it much easier for patients and their helpers to monitor their health using various medical devices, which are easy to use and require very little manual operation. This has led to a kind of democratisation of diagnostics and health monitoring.

Some of the recent technological advancements in healthcare and services are the following: electronic health record maintenance by healthcare providers, mobile health, telemedicine, portal technology or self-service kiosks, remote monitoring tools, sensors and wearable technology, wireless communications, real-time locating services, and genome sequencing. Artificial Intelligence (AI) robots can reduce risk for health care personnel. They can help patients through automatic reminders to take their medicines on prescribed times and also deliver personalized dosages. These have resulted in better and more accessible treatment, improved care and efficiency, and better disease control. DNA sequencing helps in predicting individual’s and community’s predilections for cancer and other NCDs and can lead to personalised preventive and curative healthcare. Technologies such as AI, Internet of Things, Virtual Reality, etc. are fast transforming surgical procedures and medical devices leading to increased precision and cost reduction. Drones or Unmanned Aerial Vehicles (UAVs) are useful in fumigation and sanitisation, especially during pandemics.

Technologies have already done wonders in many areas of health care to improve access and quality. The e-health programme in Africa, with cooperation of India, is a model for use of digital platforms for specialist consultation and medical education.¹⁵ Similar programmes have been introduced in other countries, either by themselves or with the cooperation of other countries. Apart from offering cost-effective primary care, e-health and telemedicine have been found to be effective in secondary prevention programmes for patients with coronary artery disease.¹⁶ It would also be

¹³ <https://www.weforum.org/agenda/2020/09/charts-covid19-malnutrition-education-mental-health-children-world/>. Last accessed on 5 April, 2021.

¹⁴ <https://www.who.int/health-technology-assessment/about/healthtechnology/en/>

¹⁵ James T C and Bhatnagar, A., 2019. *Together Towards a Healthy Future: India's Partnerships in Health Care*. Research and Information System for Developing Countries, New Delhi

¹⁶ Brørs, G., Pettersen, T.R., Hansen, T.B. *et al.* Modes of e-Health delivery in secondary prevention programmes for patients with coronary artery disease: a systematic review. *BMC Health Serv Res* 19, 364 (2019). <https://doi.org/10.1186/s12913-019-4106-1>.

¹⁷ *Bridgital Nation: Solving Technology's People Problem* by N.Chandrasekaran and Roopa Purushotaman. 2019.

¹⁸ <https://www.thebetterindia.com/49931/swasthya-slate-kanav-kahol-delhi-diagnostic-tests/>

effective in secondary prevention of many other NCDs.

An area in which technology has made dramatic changes in healthcare is in the management of health records and their easy transportability. This makes consultation with specialists anywhere in the world easier and almost on real time basis. It also helps patients in remote and rural places to maintain their health records without fear of losing them. Electronic Health Records (EHRs), once it is generated, can be saved in highly secure servers and made accessible to anyone with the authorisation. They also enable medical professionals to get automatically alerted about any side effects like allergies on their patients caused by drugs or other conditions.

Challenges

Most of the earlier problems that the world has been confronting in its efforts to achieve UHC still continue to exist in many regions and countries. Technology also adds a new factor of technological gaps. Some of the major challenges are assessed in the following paragraphs.

Reaching All

According to the WHO, currently about half of the world population do not get the health services they need and about 100 million people are pushed to extreme poverty every year because of out of pocket expenditure on health. The primary challenge, therefore, is to ensure that all get affordable healthcare that they need. The three aspects of UHC are access, affordability and quality. Access means availability of healthcare facilities at a reasonable distance from residences. Affordability depends on the financial status of the individual, but every country will have to see that its entire people are

able to afford the healthcare. Quality is what is safe and therapeutically effective. The challenge, therefore, is enormous and may vary from country to country.

Reaching the marginalised and vulnerable

While UHC means ensuring healthcare for all, there are certain sections among population who are at various disadvantages like women, people in remote localities, hilly regions, etc. and reaching them poses serious challenges. Access to affordable healthcare is hampered by absence of healthcare facilities within reasonable distance and also non-availability of qualified healthcare personnel. Thousands of persons travel more than a thousand kilometres to reach an appropriate treatment facility.¹⁷ Technologies can mend the situation to some extent. The new technologies help mobile health clinics work with sophistication. Technologies can also make available services of doctors from a distance. They also reduce the necessity of visiting a healthcare facility or a hospital as many consultations can be held online. Laboratory tests can also be conducted from a distance. An example is the *Swasthya Slate*, a medical device that can conduct 33 diagnostic tests like measuring blood pressure, blood sugar, heart rate, blood haemoglobin, etc. in 45 minutes anywhere. It is currently used in 80 locations worldwide, including in Nigeria, Peru, Norway, Canada, and India.¹⁸

Meeting new medical emergencies like pandemics

Health care includes medical consultations, medicines, nursing and diagnostic services, diagnostic devices, surgical procedures and surgical equipments, and monitoring. It will

also cover preventive health care like vaccines. In the continuing fight with diseases, development of new medicines through research and development (R&D) and clinical trials also play an important role. How new technologies like gene therapy can advance UHC will have to be explored. It will also involve an assessment of existing and emerging technologies in fields relevant to medical care. Some of them will fall under medicaments and equipments and some under service and drug delivery and still some under monitoring of patients. How biotechnology, digital technologies, telecommunication and AI can be effectively used to develop new products and making products and services accessible to all will have to be explored.

Another area where the new technologies are going to play a very significant role is that of medical data management. Currently there is much data gap in healthcare. In many countries, health care data needs significant improvement to make it reliable and consistent. Digital and telecommunication technologies are likely to influence this greatly. Apart from this, currently in many countries there are gaps in health data. Accurate data about all aspects of UHC need to be made available to healthcare personnel, administration and policy makers to effectively help the process of UHC.

The experience with past technologies has shown that while new technologies may be costly initially, over time they become cheaper and make products and services more affordable and accessible. A major concern in this regard will be that of ensuring easy transfer of appropriate technologies to the needy. How to

facilitate transfer of locally relevant technologies to the less industrialised countries is a major concern. As the recent efforts at development of vaccines for COVID-19 have demonstrated many a time specific locally specific factors such as stability of the vaccine or medicine at high temperatures, long shelf life and ease of administration will have to be accounted for in the development and transfer of technologies.

Enriching Technology

Technology is an area given to constant upgradation and innovation. Unless continuous R&D is done and new additions are made to meet needs of changing times, technology will become obsolete and may become unreliable. Therefore, there is need for high investment in R&D. However, research and innovations remain a weak point for most developing countries; this is especially so in the case of diseases that affect mostly these countries and R&D on which are generally neglected by large pharmaceutical firms, for economic reasons.

WHO estimates on gross domestic R&D expenditure on health (health GERD) as a percentage of GDP present a very unbalanced picture among countries. In region-wise estimates, the health GERD varies between 0.01 per cent in Eastern Mediterranean Region of WHO (which has Saudi Arabia, a G20 member) to 0.07 per cent in Western Pacific, and in income group-wise estimates between 0.01 per cent in lower middle income countries to 0.19 per cent in high income countries. Interestingly, low income countries spend more as a percentage of GDP compared to lower middle income countries and region-wise, Western-Pacific region, which, among others,

¹⁹ <http://who.int/research-observatory/en/>

²⁰ [https://www.nhp.gov.in/national-digital-health-mission-\(ndhm\)_pg](https://www.nhp.gov.in/national-digital-health-mission-(ndhm)_pg)

²¹ www.mygov.in/aarogya-Setu-app

²² James, T.C. et al. (2018): *Fine-Tuning IPR and Health Policies towards Achievement of SDG 3*, G20 Insights, 5 May, 2018

²³ WHA 60.29 Health Technologies.

include four G20 countries, namely, Australia, China, Japan, and Republic of Korea, spends the maximum on health GERD.¹⁹ Apart from incentivising private sector investment, governments need to explore workable models of public-private partnerships appropriate for local conditions and sectors.

Employing Technology

An area where technology can do wonders is in monitoring health care. In order to launch appropriate programmes for increasing access, the planners and strategists should know where the gaps are. This requires up-to-date and reliable data about the ground situation. Digital technologies and the Internet can make data available real time. The Government of India has recently launched the National Digital Health Mission, a project for maintenance of electronic health records of all nationals and storing them at central server.²⁰ When the personal health records of all people in a country are digitally compiled and transmitted through the Internet that can help in monitoring the access issues regularly and wherever and whenever interventions are warranted that can be done. During the COVID epidemic India also introduced a mobile application titled *Arogya Setu* that through contact tracing can advise the user to avoid hotspots of the pandemic.²¹

An overarching factor in pharmaceutical innovations is the role of intellectual property rights (IPRs). To ensure that IPRs do not become hindrances, cooperation and mutual facilitation of technology transfer among G-20 countries need to be encouraged to ensure faster progress towards UHC. This should also attend to improving the technology receptiveness capacity

of less industrialised countries. The major rationale for IPRs is that they are required for incentivising innovation. At the same time, the kind of exclusive rights granted to the owners many a time make the medicines, which are essential for UHC, costly and unaffordable. The T20 during the Argentine presidency urged countries to explore Agreement on Trade Related aspects of Intellectual Property Rights (TRIPS) flexibilities for promoting public health and also for countries adopting IPR policies that are appropriate for their health needs.²² Countries will have to keep on exploring alternatives to the system so that innovations lead to affordable medicines. Health Impact Fund, Open Source Drug Discovery (OSDD), etc. are some of the alternatives on the table. Along with the same, improvements in the existing system like new licensing practices to enable production of affordable medicines for economically weaker sections and countries will have to be explored. The practice of Fair, Reasonable and Non-Discriminatory (FRAND) Licences for Standard Essential Patents (SEPs), prevalent among electronic manufacturers, is an example.

Global Strategy on Digital Health

WHO has been stressing for long but more since 2007 the importance of health technology. In a resolution in that year it urged its members to collect, verify, update and exchange information on health technologies, in particular medical devices, as an aid to their prioritisation and allocation of resources.²³ WHO published in 2019 a *Global Strategy on Digital Health 2020-2024*. It placed digital health initiatives at the heart of achieving

UHC. This was following a resolution by the 71st World Health Assembly in 2018, which, *inter alia*, contained the commitment to “the development, evaluation, implementation, scale-up and greater utilisation of digital technologies, as a means of promoting equitable, affordable and universal access to health for all, including the special needs of groups that are vulnerable in the context of digital health.”²⁴ The vision advocated in the strategy is to “improve health for everyone, everywhere by accelerating the adoption of appropriate Digital Health”.²⁵ The strategy admitted that while appropriate use of digital technologies is a must for promoting UHC, the digital health adoption process is a country’s decision. This is proper since the digital technology preparedness of countries varies. It also stressed need to promote ethical use and also for ensuring that no one is left behind.

G-20 and UHC

Technologies can contribute significantly to the efforts to provide universal healthcare. However, it requires huge investments which poor countries can ill afford. There is also the question of technological resources and skilled researchers. These are areas where cooperation among G20 can do much. Cooperation in R&D can avoid duplication of research and thus reduce cost. Technologically advanced countries should take the lead in technology transfer and helping other countries to upgrade their technologies. That would also necessitate upgradation of capacity to absorb new technologies. Technology transfer would foster technological innovations in developing countries which would help all countries in the long run. The kind of cooperation, though not

exactly in a concerted and coordinated manner, that the world has seen during the search for a vaccine for COVID-19 is a positive sign. The special initiatives taken by the world leaders through the Sustainable Development Goals will have to be accentuated much to ensure that access and affordability gaps are filled up early.

In the past, G-20 had considered the issue and made many valuable recommendations. Under the German presidency in 2017, the G20 Health Working Group was established to develop a shared international agenda on issues such as strengthening healthcare systems, reducing malnutrition, health-crisis management and scaling up the fight against pandemics. This has continued under the Argentine presidency also.²⁶ During the Saudi Arabian presidency in 2020 also health received special attention and a policy brief focussed exclusively on Universal Health Care was prepared. In this brief, limited utilisation of innovation and technology identifies as one of the causes for many countries lagging behind in achievement of UHC. Among the challenges identified in this area are affordability of technologies to low income countries, data confidentiality and ethical aspects of technology application and expertise to address new technologies.²⁷

Recommendations

In view of the past recommendations and recent developments, the following steps can be initiated by G20 countries individually and collectively to promote accelerated use of technologies for UHC and for reducing health inequities:

- Sharing of best practices in the area among the G20 countries and also with other countries
- Higher public expenditure on R&D for health innovation

²⁴ WHA Resolution 71.7.

²⁵ *Ibid.*

²⁶ <https://www.oecd.org/g20/topics/global-health/>

²⁷ Alahmadi Hanan, *et al.*, *Accelerating Progress Toward Universal Health Coverage*. T20 Saudi Arabia 2020.

²⁸ G 20 Germany 2017 Business 20 Dialogue. *Stepping up Global Health: Towards Resilient, Responsible and Responsive Health Systems*. B20 Health Initiative Policy Paper 2017.

²⁹ *Ibid.* p.12.

Digital Health Transformation

Advancements in the digital health transformation would allow systems to become more efficient and patient-oriented with care provided increasingly remotely. Costs of healthcare could be reduced, benefiting both patients and firms. Digitisation in healthcare can enable both improved clinical and societal outcomes. Digital health applications can also help to optimise conventional treatment approaches and provide novel diagnostic techniques and forms of therapy and thus improve overall care. It creates opportunities to make greater use of real world data for insights into treatment outcomes for patients, more efficient research and development of highly effective therapeutics and medical technologies, and ultimately better informed policy decisions by regulators. G 20 Germany 2017 Business 20 Dialogue. *Stepping up Global Health: Towards Resilient, Responsible and Responsive Health Systems*. B20 Health Initiative Policy Paper 2017. P.41

In 2017 under German presidency, the Business 20 Dialogue came out with a detailed policy brief on 'Stepping up of Global Health' in which specific policy action recommendations were made, *inter alia*, for encouraging innovation, scaling-up R&D, increasing funding for research and product development, and advancing digital health including improving digital health infrastructure.²⁸ Taking note of SDG 3, it recommended that G20 members should promote access to essential health services to their citizens "by sharing best practices, building improved healthcare policies, incentivising private sector involvement, and empowering citizens by enabling self care ...".²⁹ These recommendations point to the need for encouraging technological innovations in healthcare. While domestic technology generation by G20 countries will be there, what is required more is facilitation through development partnerships upgradation and creation of new health technologies that will address local needs by developing countries.

- Encouragement of public-private partnerships in healthcare technology development and deployment
- Commitment from all members to development of new healthcare technologies
- Digitisation of healthcare data of entire population
- Development of health databases on easily searchable formats and making anonymised data available to researchers for development of new technological devices and drugs
- Use of technology for healthcare delivery, management and monitoring
- Measures for protection of personal and, wherever necessary, institutional, privacy in data transfer
- Facilitation of technology and know-how transfer
- Development of IPR policies that encourage and facilitate development of new technologies
- Enhancement of cyber security in health data.

A concerted effort by G20 will bring much positive results and accentuate achievement of UHC by the world, and health technology is an area where the efforts can bring high returns.

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Core IV-B, Fourth Floor
India Habitat Centre
Lodhi Road, New Delhi-110 003, India.
Tel. 91-11-24682177-80
Fax: 91-11-24682173-74-75
Email: dgooffice@ris.org.in
Website: www.ris.org.in