Artificial Intelligence and priorities for Universal Health Coverage

Artificial Intelligence (AI) is a buzz word today and all international peer reviewed medical journals are publishing and discussing using AI in many aspects of health care delivery and universal health coverage (UHC). Smartphone ownership among doctors and nurses is almost universal, who perceive these devices to be useful when performing their clinical duties. Large numbers of staff are sending patient related clinical information using smartphone messaging modalities.[1] [2] Similar trends are being observed for LMICs. Wahl et al in BMJ conclude that AI holds tremendous promise for transforming the provision of healthcare services in resource-poor settings.[3]

Innovative primary health care (PHC) service providers in LMICs are already using some of the applications to improve the health service provision, but the thrust is sporadic and lacks comprehensive approach. Moreover, it is not being utilised optimally to attain UHC.[4] PHC is still exceedingly inclined towards illness care, rather than having a healthy balance between prevention and cure. AI and IT have a great potential to assist in this process effectively and efficiently.

This article pinpoints specific areas of technological interventions. I have **highlighted** and ***italicised*** AI and IT techniques for the use in PHC to achieve UHC. This article largely relates to LMICs but the applications are universally applicable.

Improving standards of illness care: There is urgent need to use already available standards of medical treatment at PHC level to reduce unacceptably high mortality, especially maternal and childhood mortality. Many LMICs experience maternal mortality ratio of over 500/100,000 live births compared to less than 10/100,000 live births in the resourch-rich world. Similarly Infant mortality of nearing 100/1000 LB in remote and poor countries is not uncommon compared to less than 5-7 in the developing world. Appropriate and timely support from district hospitals can be available at almost no cost using various ***tele and video communication links***, most of them requiring just a ***sim card and/or Wi-Fi link***. Lessons are to be learnt from many international rescue services who use this methodology to transport patients from remote and far off places using audio and video technology for stabilisation before transfer. This is particularly applicable in saving lives for complications of pregnancy and serious childhood conditions like severe diarrhoeas and pneumonias, to reduce preventable morbidity and mortality. On line advice to stabilise and evacuation of complications in PHC rarely happens and delays often result in loss of life. Training of health workers certainly is an important part of it and technology alone cannot help unless there are conscientious and compassionate PHC workers and the doctors at the district hospitals.

Maternal and Child Health: Women and children bear huge burden of morbidity and mortality and over 60% of PHC services are consumes by this group. AI and IT can improve the quality and all-inclusiveness of the services provided. It is well known that stunting, wasting and under nutrition among Under-5s comprise of at least 33% in LMICs. Yet comprehensive growth

monitoring is still not part of PHC. Growth monitoring is a birth right of every child and every primary health center should have a growth monitoring programme ensuring that every child in the area receives regular monthly monitoring and advice. This is the best opportunity for mothers and children to receive an inclusive advice and care. Immunsation, nutritional and contraceptive advice, ante and post natal care for the mother, proper planning and preparation for next child and birth can be organised through this activity. ***WHO Anthro software***, an excellent technology for growth monitoring and reporting, free of cost is available to anyone who wishes to use it. The monthly programme, for sustainability, should be organised by Village Health Committees and run by the VHW in each village to ensure UHC. Technical assistance should be provided by the presence of PHC staff at the clinic.

Adolescent Health: Education and health are integral to human capital development. Following Under-5 growth monitoring, it is essential for school children (6-16 year olds) to be monitored under the school health programmes. ***WHO Anthro Plus*** is another free of cost software to use in growth monitoring among school children and adolescent. Schools must take the responsibility to organise it and health workers from primary health center providing any technical assistance, such as immunisations and deworming programme if indicated. Advice on nutrition and healthy life style, responsible sex, sexually transmitted infections, contraception, dangers of drug use (alcohol, tobacco and other substances) are all part of this programme leading to address risk factors for communicable and non-communicable diseases and continued optimal health.

Non-communicable diseases: Diabetes, hypertension, heart disease and other chronic diseases constitute the modern epidemic. These conditions are largely attributed to life style changes in what we eat and lack of physical activity. Awareness of the risk factors for NCDs to adults to take control of their own health and minimise dependence of medications is the primary function of PHC. Advice from health center staff and VHWs on healthy lifestyle to contain the risk factors is important. Public education through ***mass media, SMS messaging*** and use of ***heath applications*** can do wonders through ***phones, wrist watches, TV networks and websites*** are all the technologies widely available to address the problems.

Tools for PHC workers: Health workers at PHC and District Hospitals need to be familiar with the applications discussed here so that they can use the technology themselves and advise their clients how to use gadgets and the advantages of using them. One of the essential tool required to evaluate their own efforts is to have full computerised ***age and sex register*** of health center's catchment population. This serves as a denominator to calculate health indicators like birth and death rates, immunisation, and contraceptive prevalence etc. In addition to monitoring, it serves as an important function of call and recall for service provision (immunisation, FP, cervical cytology etc.) and again ***SMS messaging*** is an important tool. Age/sex resister can be downloaded from most recent ***census data*** and updated at village level by VHW and the village head. ***Smartphones and Tablets*** can be effectively used for onsite data collection, improving the timeliness and the quality of data.

Health Education: Dissemination of information and facts are an essential, but remains a neglected component of PHC. Propagation of information increases awareness and empowers

the weaker individuals and communities. Dependence of medication as the only solution and excessive use of health services is an increasing problem and leads poor people into further poverty and crippling debts. Health educationists, nutritionist and other health workers can use IT very effectively. Use of ***SMSs, digitised protocol links, PHC website, Hole in the Wall [5]*** are some of the examples.

Artificial Intelligence and Information Technology is developing at an unprecedented speed and newer methods and techniques are evolving by the day. There are opportunities to be seized to improve health care deliver system in LMICs much more effective and efficient. To sum up if currently available technologies are put to use in Primary Health Care delivery, the burden of preventable conditions and chronic disease will reduce significantly and Universal Health Coverage will become a reality.