**Surely, AI & IT can strengthen Primary Health Care for all**  
  
Happy New Year to all my readers  
  
2020 is reckoned to be a year of Artificial Intelligence (AI) and optimization of Information Technology (IT). WHO published a set of guidelines last year, pointing out substantial innovation opportunities in digital health.[**[1]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftn1)  The advent of artificial intelligence (AI), big data, and the next-generation telecommunication network (5G) has generated enormous interest in digital-health. Digital health comprises overlapping areas ranging from AI, the internet of things, electronic health, and telehealth to the analysis and use of big data.[**[2]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftn2) However, the emphasis remains on illness care, with little focus on prevention in primary health care (PHC).  
  
This week I want to emphasise how PHC and universal health coverage (UHC) could benefit from AI and IT.  
  
The public health crisis of underimmunisation**[[3]](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php" \l "_ftn3)** and resurgence of measles has been in the news for some time, voicing concerns in USA, UK and Australia, countries where measles had almost been eradicated. In developing countries immunization rates still remain below 80%; however, millions of children from killer diseases like measles, tetanus and whooping cough are still alive because of vaccination programmes.[**[4]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftn4) Polio is almost near eradication. Campaigns against immunisable diseases have largely been vertical programmes with the aim of total population coverage. Local communities rely on periodic immunisations sweeps for coverage. Had this approach been incorporated in to a comprehensive approach to maternal and child health services, perhaps the sustainability in coverage would have been better.  
  
Primary health care (PHC) has been neglected in strengthening maternal and child health. PHC continues to be focused on illness care, with lip service to preventive aspects of health. In maternal health, push is to encourage institutional delivery and care of the mother before and after birth receives inadequate attention. Malnutrition among children and mothers is specially a neglected area and is the most important underlying cause of morbidity and mortality. Prevention of malnutrition among children, especially in the first 1000 days, has lifelong health benefits.[**[5]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftn5) Moreover undernutrition and obesity are interlinked and the double burden of malnutrition; the coexistence of overnutrition (overweight and obesity) alongside undernutrition (stunting and wasting), at all levels of the population—country, city, community, household, and individual.[**[6]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftn6) Undernourished children tend to develop obesity later in life, further triggering non-communicable diseases associated with overweight and obesity. Yet universal growth monitoring is not available to under-fives in PHC.    
  
Roles and responsibilities of stakeholder groups who must create the systemic changes needed to end malnutrition[**[7]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftn7) is only workable if the communities are also aware and choose wisely what to eat and feed their children, thus creating demand for healthy foods. Children are increasingly fed on commercial white bread and buns along with sugary snacks and drinks. Effective education programmes are desperately needed to change this.  
  
Adolescent girls, the prospective mothers and all women caring for under-fives are the key to these changes. Despite the pledges made in Beijing in 1995, the global community's commitments to SDG 3 and SDG 5, and the increasingly compelling body of evidence for how gender inequalities shape health[**[8]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftn8), remain unfulfilled, situation being much worst in rural and remote communities. The process must start with empowering women and communities at PHC level, so that communities understand the issues affecting their health and make informed choices. Women face neglect at home and lack adequate support from health services. Empowering women can make a difference as they are the ones who feed children and the household. If girl-child receives equal treatment during childhood and continue to receive adequate care into adolescent years, the next generation is bound to be healthy.  
  
Information Technology and innovative Artificial Intelligence can be cost-effectively used to strengthen PHC level to allow preventive and promotive services to be made available to all women and children:  
  
**Population data (age-sex register)**   
Most countries have population data from censuses and although each primary health center have this data for their catchment populations, but it is rarely made use of. The data remains with planning departments and seldom gets updated between censuses. Health centers must make use of this data to provide services to all, ensuring that no one is left behind. Village heads are responsible for passing on births and deaths data to local authorities. Village health workers (VHWs) are supposed to attend to all births and refer them to PHCs or hospitals, and are well aware of vital statistics in the village. With the modern information technology available already, creating an electronic age-sex register of the local population is quite feasible. This then serves as a denominator to calculate health indicators like birth and death rates, immunization rates 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.). Once age-sex register is maintained, sustainable universal health coverage becomes a reality.  
  
**Maternal and Child Health (MCH) Clinic**  
Women with children form an important group to benefit from MCH clinics, which is a multipurpose clinic and an opportunity to get most mothers with their Under-fives to attend. Growth monitoring for under-fives is an essential aspect of this service. The responsibility for organizing this monthly MCH clinic should fall on the village health committees, with VHWs taking the lead. Getting all mothers with under-fives to the clinic, measuring heights and weights, nutritional advice, family planning and a number of other services can be provided by the VHW, resulting in a close bond between mothers and the VHW. The health worker, preferably a midwife, from the health center supervises the VHW and the clinic for technical aspects of services like immunisations, pregnancy related care and other technical aspects of MCH care. The midwife, apart from treating and referring any illnesses or other health problems faced by VHW, has an important role to provide in service training and guidance to the VHW. Over a period of time the VHWs can take even greater responsibilities because of the experience gained during these clinics.  
  
**Information Technology**  
MCH services can be enhanced with IT and service provision to all women and children is feasible. Technology is available to create age-sex register by downloading from central repositories with the help from district information officer, maintaining the register is then relatively easy with regular updates for births, deaths and any migrations from the village. VHWs serve small populations and work load for MCH activities is quite manageable, e.g. in Lesotho each VHW serves 40 households. Tablet or smartphone use for updates can make the task not only easy but also improve data completeness, quality (accuracy) and timeliness.  
For growth monitoring to address malnutrition, WHO Anthro software can be used very effectively to monitor growth and development for all Under-fives and even school children (WHO Anthro Plus), both available free of charge from WHO website. The only requirement is a PC or a tablet to enter data during the clinic; and the system stores information and automatically produces individual or cluster reports for monitoring. Data transfer to health center or district offices is possible at regular intervals for cumulation and analysis.  
  
There is plentiful potential of IT as a tool to promote health by using messaging services for health education for VHWs and the public. “Hole in the Wall”[**[9]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftn9) similar to an ATM where public can access free internet, has been used effectively to educate rural youth and communities. Various Apps and software packages can be used effectively to make people aware of the health issues affecting them and to promote health.  
  
Let us further strengthen PHC with information technology for sustainable future.  
  
**References**  
[**[1]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftnref1) WHO guideline: recommendations on digital interventions for health system strengthening.  
[**[2]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftnref2) Ting et al. Artificial intelligence, the internet of things, and virtual clinics: ophthalmology at the digital translation forefront. Lancet Digital-health. 1 Jan 2020.  
[**[3]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftnref3) Gostin et al. The public health crisis of underimmunisation: a global plan of action. Lancet Infectious Disease. January 1, 2020.  
[**[4]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftnref4)  www.gavi.org/vaccine-progress-in-developing-countries-in-danger-of-stalling  
[**[5]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftnref5) Shekar et al. Investing in nutrition: the foundation for development—an investment framework to reach the global nutrition targets. World Bank, Results for Development, Bill & Melinda Gates Foundation, CIFF, 1,000 Days, Washington, DC2016  
[**[6]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftnref6) A future direction for tackling malnutrition. Editorial. Lancet Vol 395 January 4, 2020.  
[**[7]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftnref7) Willett W, Rockström J and Loken B et al. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. Lancet. 2019; 393: 447-492  
[**[8]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftnref8) 2020: a critical year for women, gender equity, and health. Editorial. Lancet, Vol 395 January 4,2020.  
[**[9]**](https://116990868-235518804204378121.preview.editmysite.com/editor/main.php#_ftnref9) [**https://www.youtube.com/watch?v=13xdH\_kBwds**](https://www.youtube.com/watch?v=13xdH_kBwds)

**Illustrations**: Manual WHO Anthro; Individual chart; and Analysis of a Cohort