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## Decentralisation of healthcare system due to COVID-19 and its impact on hospital based laboratories - Pandemic panic patients' reflection?



Sir,

Nationwide lockdown is under enforcement by the Governments of most countries across the world since mid-March or early April 2020. This lockdown did not spare even the health care facilities starting from primary to quaternary systems except those centers treating Corona Virus Disease (COVID-19) patients and those providing other emergency medical services. In spite of it lockdown did not stop people from getting consultations for their acute or chronic illnesses. As the health system has evolved quickly to decentralize and services like home care, mobile health unit, Telemedicine, etc. confirmed their position within the health care industry. Telemedicine an emerging concept gained its maximum popularity and is getting utilized to its fullest capability during this lockdown (Banerjee, Chakraborty & Pal, 2020; Ghosh, Gupta & Misra, 2020; Panchangam, Kota & Mayilvaganan, 2020). This was eased by readily accessible various video conferencing and communication platforms that are capable of encrypting information end-end without breach of patient confidentiality. There were also many healthcare providers who were already pioneering in decentralized health care services promoting concepts like 'Hospital / Lab on Wheels', 'Mobile Dialysis Units', 'Mobile Coronary care Units', 'Mobile Ante-Natal Care and Vaccination Units' etc. also gained popularity amongst public. Accepting the fact that both fear of COVID-19 and infection per se is going to stay within the community for a while, one cannot overlook the risk of infection spreading to walk-in patient visiting out-patient departments (OPD) for health consultation and routine follow-up (Basu, 2020). This letter aims to communicate the advantage of decentralizing medical laboratory services and to what extent the available Point Of Care Testing (POCT) technologies can support the telemedicine services. In this current pandemic situation monitoring of patients with common chronic non-communicable disease can be eased by use of available POCT technology. This could reduce the inflow of patient to OPDs for their routine periodic follow-ups and ultimately reducing the burden on health care workers. On the flipside a segment of general public is also scared to visit hospital OPDs out of awareness on the need for social distancing which may be comprised in crowded waiting halls. In developing countries, even best of the best appointment systems also cannot assure complete safety due to the low Doctor to Patient ratio. This doesn't end here as people are also scared of medical workers like phlebotomists, physiotherapist visiting them, so from now on patients and their caretakers are willing for contactless or minimal contact health services wherever possible and available. Considering above facts we related the scope of laboratory testing in hospital based labs and opportunities to decentralise

it by utilizing compact POCT equipment in mobile health services and self-operable portable medical devices. Laboratory unit is an essential component for any health care provider irrespective of the type of care (primary to quaternary) they provide. Like any other speciality, Laboratory services can never be completely decentralised, at the same time we cannot also deny the fact that many tests aiding the monitoring of common chronic illnesses like Diabetes mellitus, Hypertension, Chronic Kidney disease, etc. can be easily performed by compact POCT or self-operable equipment with minimal or no contact with health workers. Currently leading manufacturers in diagnostic industry have got FDA approved and CE marked line of POCT products that are very compact, user friendly and not heavy on pocket too. Most of them are capable of performing routine investigations like Haemoglobin, Total Count, Differential count, O<sub>2</sub> Saturation, Electrolytes with anion gap, Glucose, Lactate, Bilirubin, Urea, Creatinine, Total Cholesterol, CRP, Procalcitonin and even High sensitive Troponins needing only few microlitre of capillary blood. With digital pathology stepping in getting an opinion on peripheral smear or Pap smear reporting is also possible if required (Borowsky, Glassy & Wallace, 2020). Advanced models are even capable of communicating the measured results to the consulting clinician directly. Also similar to Glucometers there are self-operable HbA<sub>1c</sub> meters with NGSP certification available for accurate measurement of Glycated Haemoglobin which can guide the dose adjustments. Researchers have also designed and developed digital stethoscopes which can intelligently acquire signals of both heart sounds and electrical activity and transfer them to the consulting clinician, though not a laboratory's scope but worth mentioning (Baptista, Silva & Rocha, 2020). When these POCT and self-operable devices gains popularity amongst general public we can reduce this particular patient community visiting hospitals to a greater extent which in-turn reduces their risk of contracting SARS-CoV-2 infection (Kost, 2019). Moreover there will be a substantial reduction in cost borne by the patient themselves or sometimes employers who provide health benefits to their employees. A hospital visit should be always considered as a risk during times like COVID-19 pandemic as anyone may become an asymptomatic carrier and spread infection to their own vulnerable family members. The central laboratories should utilize this opportunity to upgrade their scope of testing with more focus on performing specialised immunoassays, serological tests and molecular level tests within each sub-speciality (Khan, Shakeel, Hooda, Siddiqui & Jafri, 2019; Kost, Zadrán, Zadrán & Ventura, 2019). Decentralisation of Laboratory services cannot replace or reduce the work burden of hospital based Laboratory because most of these POCT equipment and related documentations are part of central lab's responsibility

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ties. In most hospitals it is the laboratory section which is involved in selection of appropriate equipment to it continuous performance monitoring until decommission. Greatest worry for any stakeholder by this decentralisation is regarding the reliability of test results. This will be the biggest challenge for manufacturers as they have to design and define incorporating all relevant quality specifications like calibration frequency, QC flagging, measurement traceability, expiry of consumables etc. (Shaw, 2016). Though decentralisation of laboratory services is not a newer concept this has now definitely become an acceptable substitute with no compromise in quality of medical care. It is the responsibility of every laboratory physicians to induce their fellow clinical colleagues and hospital administration about the scope of POCTs and self-operable portable testing equipment and their reliability. It is also their responsibility to devise clear policy on decentralisation of laboratory services and its potential utility. Above all decentralisation of laboratory services is an acceptable substitute but can never be a replacement. Though decentralized laboratory services is an effective option it cannot replace a fully equipped state-of-the-art central laboratory of a hospital anytime in future.

The letter aims to encourage more translational research contributing to development of compact POCT and self-operable compact medical devices that are capable of optimizing and expanding the spectrum of telemedicine services. We also emphasize that the present day medical technology should be developed in such a way that they are capable of mitigating future disasters like this COVID-19 pandemic

#### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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