

## PUBLIC HEALTH INFORMATICS: A RAY OF HOPE FOR PEOPLE AMID PANDEMIC COVID-19 IN BANGLADESH

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### ABSTRACT

Never before has health informatics played a greater role in public health than during the COVID-19 pandemic. While the Health IT industry is certainly challenged due to the overall disruption to the healthcare system, the pandemic undoubtedly underscores the opportunity and importance of health informatics, such as telehealth, remote patient monitoring, electronic health record (EHR), online training for health-care provider, online health briefing, health awareness caller tunes. In this study we are trying to review and share emerging science, best-practices and policy shifts that may affect how our communities, healthcare and public health systems, insurers and providers respond to and manage the COVID-19 pandemic. Searching in different types of journal portal like PUBMED, Nature, Hinari, Google Scholar we accumulate total 42 articles regarding public health informatics with different era and also COVID-19. After proper literature review we took only 19 articles and newsletters for this review purpose. This is the time for all public health experts to redouble the efforts to communicate the best information to those seeking a trusted and reliable source. Everyone will try to continue to share emerging science, best-practices and policy shifts related to COVID-19. And, because COVID-19 may intensify other gaps in public health systems and infrastructure, everyone should try continue to share other important public health news, research and policies and help in spreading COVID-19 related information.

**KEYWORDS:** PHI, Ray of Hope, Pandemic, COVID-19, Telemedicine, E-Health, HER.

### INTRODUCTION

Never before has health informatics played a greater role in public health than during the COVID-19 pandemic. While the Health IT industry is certainly challenged due to the overall disruption to the healthcare system, the pandemic undoubtedly underscores the opportunity and importance of health informatics, such as telehealth, remote patient monitoring, electronic health record (EHR), online training for health-care provider, online health briefing, health awareness caller tunes.<sup>[1]</sup>

One of the biggest casualties of the Covid-19 pandemic and the resultant lockdown has been institutionalised education. Schools have been shut to prevent the spread of the virus and this has given way to online classrooms, a very new concept in world even for the most sophisticated schools. It is commendable how easily some educational institutions have moved to virtual

classrooms, but there are some still struggling to get online.<sup>[2]</sup>

Dual-track health systems to manage both the COVID-19 response and other services are an essential component of transition planning.<sup>[3]</sup> While the incidence of COVID-19 continues to rise, healthcare systems are rapidly preparing and adapting to increasing clinical demands. Inherent to the operational management of a pandemic in the era of modern medicine is leveraging the capabilities of the electronic health record (EHR), which can be useful for developing tools to support standard management of patients. Technology-based tools can effectively support institutions during a pandemic by facilitating the immediate widespread distribution of different types of information, tracking transmission in real time, creating virtual venues for meetings and day-to-day operations, and, perhaps most importantly, offering telemedicine visits for patients.<sup>[4]</sup>

As fear grows among people over the fast transmission of deadly coronavirus and taking treatment going to a doctor or hospital has become riskier for all kinds of patients, including the COVID-19 ones, telemedicine services have appeared as a solution amid the pandemic crisis. The infrastructure for telemedicine services is being developed in the country amid the outbreak of novel coronavirus pandemic as different government and non-government institutions and voluntary groups have come up with healthcare services through virtual platforms.<sup>[5]</sup>

## MATERIALS AND METHODS

In this study we are trying to review and share emerging science, best-practices and policy shifts that may affect how our communities, healthcare and public health systems, insurers and providers respond to and manage the COVID-19 pandemic. Searching in different types of journal portal like PUBMED, Nature, Hinari, Google Scholar we accumulate total 42 articles regarding public health informatics with different era and also COVID-19. After proper literature review we took only 19 articles and newsletters for this review purpose.

### Tools and Resources for the Health It and Electronic Health Record (Ehr)

In Bangladesh, health IT now plays a crucial role in the collecting and reporting of COVID-19 data. Additionally, electronic health information exchange can facilitate effective strategies to combat COVID-19, including:

- Surveillance
- Public health reporting
- Laboratory testing
- Clinical data collection
- Case investigation and management
- Reporting outcomes
- Workforce Safety and Health.<sup>[6]</sup>

Table 01 shows the resources created by DGHS, IEDCR, and other partners, which the health IT community and healthcare providers can reference as respond to this emerging disease.

The EHR is a useful tool to enable rapid deployment of standardized processes. UC San Diego Health built multiple COVID-19-specific tools to support outbreak management, including scripted triaging, electronic check-in, standard ordering and documentation, secure messaging, real-time data analytics, and telemedicine capabilities. Challenges included the need to frequently adjust build to meet rapidly evolving requirements, communication, and adoption, and to coordinate the needs of multiple stakeholders while maintaining high-quality, pre-pandemic medical care.<sup>[4]</sup>

### Telemedicine and Telehealth

The World Health Organization (WHO) has defined Telemedicine and Telehealth as, "the delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for the diagnosis, treatment, and prevention of diseases and injuries, research and evaluation and for continuing education of healthcare providers, all in the interest of advancing the health of individuals and their communities".

HRSA (The Health Resources and Services Administration) of the United States Department of Health and Human Services defines telehealth as the use of electronic information and telecommunications technologies to support and promote long distance clinical health care, patient and professional health-related education, public health and health administration. Technologies include videoconferencing, the internet, store-and-forward imaging, streaming media, and terrestrial and wireless communications.

Telehealth applications include:

- **Live (synchronous) video conferencing:** a two-way audio-visual link between a patient and a care provider
- **Store and forward (asynchronous) video conferencing:** transmission of a recorded health history to a health practitioner, usually a specialist.
- **Remote patient monitoring (RPM):** the use of connected electronic tools to record personal health and medical data in one location for review by a provider in another location, usually at a different time.
- **Mobile health (mHealth):** health care and public health information provided through mobile devices.

The information may include general educational information, targeted texts, and notifications about disease outbreaks.<sup>[6]</sup>

Telemedicine was shown to be helpful in previous outbreaks, including former coronavirus outbreaks such as SARS-CoV (severe acute respiratory syndrome-associated coronavirus) and MERS-CoV (Middle East respiratory syndrome coronavirus), or PHEICs related to Ebola and Zika viruses. Most countries, however, lack a regulatory framework to authorize, integrate, and reimburse telemedicine in their care delivery for all patients, particularly in emergency and outbreak situations. Two possibilities are currently available for patients:

- Direct-to-consumer telemedicine with private providers mostly relying on out-of-pocket or private insurance payment and
- Free solutions, mainly from country-based companies that may not respect national health data privacy and security requirements.

Although these solutions may be useful to support and alleviate the pressure on health care systems during the outbreak, to date, they are mostly unintegrated within national health care systems and not sharing data with public health authorities for epidemiological surveillance.

### Worldwide Situation Regarding Telemedicine During Covid-19

With the second largest burden of COVID-19 in the world, Italy does not include telemedicine in the essential levels of care granted to all citizens within the National Health Service. No formal input was given on telemedicine by health authorities, despite high pressure on health services during the first phase of the epidemic; not until an open call for telemedicine and monitoring system technologies proposals on March 24th was jointly issued by the Ministry for Technological Innovation and Digitalization, the Ministry of Health, the National Institute of Health and the WHO.

In France, the Ministry of Health signed a decree on March 9, 2020, allowing the reimbursement of video teleconsultations and tele-expertise by the National Health Insurance (NHI), for patients with COVID-19 symptoms and those confirmed with COVID-19 throughout the country, without the need to know the patient beforehand. The decree was aimed to decrease unnecessary travel for medical consultations, limit the number of individuals grouping in waiting rooms, screen and detect suspected patients, and allow follow-up of mild confirmed cases from home.<sup>[7]</sup>

Bangladesh Garment Manufacturers and Exporters Association (BGMEA) and Common Health Bangladesh have signed an agreement to provide free telemedicine service to one lakh garment workers. Common Health will provide up to one lakh workers with a free phone-based consultation with MBBS doctors covering queries relating to primary health care, mental health, and COVID-19, according to apex body of the country's apparel industry.<sup>[8]</sup> The Government republic of Bangladesh launched 3 tele-communication sites of health-care purposes during COVID-19 outbreak. Up to 31 May, 2020 about 4202464, 4182505 and 245003 calls have been received over “16263”, “333” and by “IEDCR” respectively regarding COVID-19 related problems.<sup>[9]</sup> **(Figure 01).**

### Preparation For Educational Emergencies

One of the biggest casualties of the Covid-19 pandemic and the resultant lockdown has been institutionalised education. Schools have been shut to prevent the spread of the virus and this has given way to online classrooms, a very new concept in world even for the most sophisticated schools. It is commendable how easily some educational institutions have moved to virtual classrooms, but there are some still struggling to get online. There are teachers and schools putting extra effort to engage students in classes by revamping

timetables, shifting discussions online, taking feedback from parents and monitoring students constantly. While there are some who are doing the bare minimum and using WhatsApp to stay connected with students. Some schools are trying out tools like SeeSaw, Google Suite and YouTube videos to make online classes as engaging as offline ones. But there are also those that are failing miserably at this shift.<sup>[2]</sup>

### Advantages and Disadvantages of Online Classes

- The online classes, whatever the enabling technology, is only as good as the teachers and the ability of the students to grasp the new teaching technique. Teachers felt that students are actually more responsive and active in online classrooms, compared to when they are in physical ones.
- Teachers found the absence of a blackboard a disadvantage and network connectivity a constant problem.
- Their main argument against online classes is also one of the biggest problems that most developing countries face lack of a stable internet connection.
- Students have also argued that conducting online classes discourages class participation because doing class work becomes a privilege that only people who have laptops or computers can afford. In the current situation, people are neither able to access cyber cafes or are able to get their computers fixed if there is a malfunction.
- Our education system still expects children to write exams. It's difficult to monitor actual writing in a virtual mode: they might get good at typing, but getting them to readjust to offline mode might be a challenge too.
- Too much screen time can be perilous for health. Prolonged online sessions can be overwhelming and may lead to problems related to vision, body posture and sleep disorder.<sup>[2,10]</sup>

UNICEF is working with the Government of Bangladesh to offer effective remote learning programmes using TV, radio, mobile phone and Internet platforms to reach the maximum number of students during this pandemic situation. UNICEF has also helped produce guides to assist teachers that are giving remote classes. Unlike in many developed countries, most children in Bangladesh do not have access to the Internet. This is why the initial education response focused on delivering classes on TV, as television sets are more widely available in households.<sup>[11]</sup>

### E-HEALTH

When the internet is used to provide education for health care professionals, educators have used a range of approaches. Early examples used email communication only, as technological advances occurred, elaborations included the addition of resources online (on web-pages or as downloadable files), sound, video, slideshows, animation and additional means for communication (live chat rooms, bulletin boards and audio). In addition to

using the Internet, some courses were combined with face to face teaching approaches, such as lectures and small group learning, often referred to as blended learning. This diversity of approaches in the use of the internet for educational purposes has resulted in an explosion of terms used to describe it – web-based learning or course, Internet-based learning or course, e-learning, blended learning or course and webinars. The only commonality between these terms is that Internet technology is somehow used in the educational process be it to provide learning materials, enable communication between learners and tutors and to provide feedback on performance. As such there is no consensus on the preferred term and in this report our preferred term is internet-based learning, predominately as it succinctly describes the educational approaches we are interested in.<sup>[12-14]</sup>

Not only The World Health Organization (WHO), but also The Government of Bangladesh launched different types online health training program for health care providers and also for mass population for teaching them

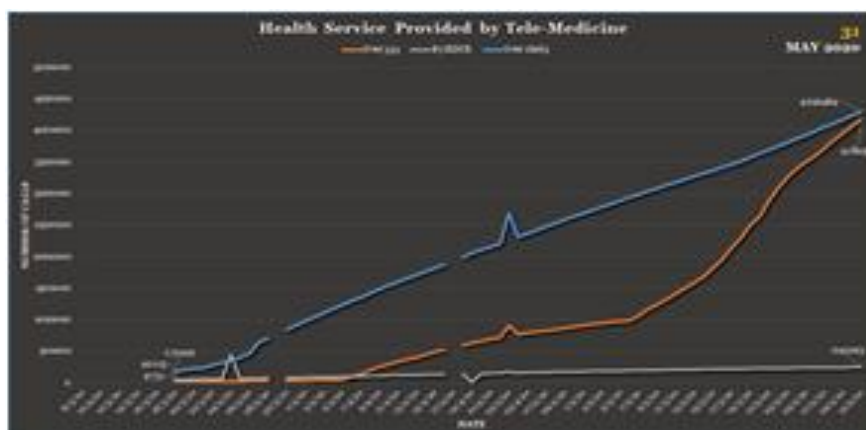
about the primary management of COVID-19 and also increasing their awareness regarding this issue. In Bangladesh, up-to 31 May, 2020 about 4217 health care provider joined into “Shastho Batayon” hotline for giving advisory support regarding COVID-19 after finishing the online training course regarding COVID-19.<sup>[9]</sup>

With the support of a web based platform named “a2i” Bangladesh Ministry of Health has been started “Online Press Briefing of COVID-19 Status” instead of press release in front of a small number of journalist. This helps to spread the news more firstly towards the mass population with minimum disruption.

In India, the government has ordered all telecom firms to make a 30-second audio clip on coronavirus as a caller tune of mobile phone users to create awareness among masses about the epidemic.<sup>[15]</sup> The Government of Bangladesh also launched this type of health awareness caller tunes regarding COVID-19 in maximum mobile operator.

**Table 01: Resources created by DGHS, IEDCR, and other partners as respond to emerging disease in Bangladesh.**

<b>Coronavirus (COVID-19) Dashboard, 2020 (DGHS)</b>	<a href="http://dashboard.dghs.gov.bd/webportal/pages/covid19.php">http://dashboard.dghs.gov.bd/webportal/pages/covid19.php</a>
Coronavirus (COVID-19) Info by Government Republic of Bangladesh	<a href="https://corona.gov.bd/">https://corona.gov.bd/</a>
Bangladesh COVID-19 Update by IEDCR	<a href="https://iedcr.gov.bd/">https://iedcr.gov.bd/</a>
COVID-19 in Bangladesh: A Visual Guide to the Economic Impact by Light Castle Analytics Wing	<a href="https://databd.co/stories/covid-19-in-bangladesh-a-visual-guide-to-the-economic-impact-11064">https://databd.co/stories/covid-19-in-bangladesh-a-visual-guide-to-the-economic-impact-11064</a>
Bangladesh Coronavirus Recovered by Trading Economics	<a href="https://tradingeconomics.com/bangladesh/coronavirus-recovered">https://tradingeconomics.com/bangladesh/coronavirus-recovered</a>
Coronavirus (COVID-19) Tracker for Bangladesh by Accu Weather	<a href="https://www.accuweather.com/en/bd/national/covid-19">https://www.accuweather.com/en/bd/national/covid-19</a>
COVID-19 Dashboard by Bengal Institute	<a href="https://bengal.institute/research/covid19bangladesh/">https://bengal.institute/research/covid19bangladesh/</a>
COVID-19 Information by US Embassy in Bangladesh	<a href="https://bd.usembassy.gov/covid-19-information/">https://bd.usembassy.gov/covid-19-information/</a>
Humanitarian Data Exchange by OCHA	<a href="https://data.humdata.org/event/covid-19">https://data.humdata.org/event/covid-19</a>
Coronavirus (COVID-19) Situation in Bangladesh 2020 by Group-Mappers, GURO Epidemiology	<a href="https://groupmappersbd.maps.arcgis.com/apps/opsdashboard/">https://groupmappersbd.maps.arcgis.com/apps/opsdashboard/</a>



**Figure 1: Health Service Provided by Telemedicine in Bangladesh during COVID-19.****Webinar And Online Courses Regarding Covid-19**

The International Association of National Public Health Institutes (IANPHI) has made available resources from the IANPHI-hosted webinars featuring IANPHI members' senior public health leaders sharing their experience responding to the COVID-19 pandemic. The Norwegian Institute of Public Health (NIPH) has published a live COVID-19 evidence map. The map collects the growing body of global knowledge about the SARS-CoV-2 virus and COVID-19 pandemic, and displays it using an easy-to-navigate, finely categorized interface. WHO has been launched free online learning platform for health emergencies with courses on 10 different topics to support the COVID-19 response (22 languages, 70 learning resources).<sup>[17]</sup>

**Covid-19 Employment Opportunities**

In partnership with the Oregon Public Health Institute, Public Health Institute is hiring numerous positions to support Washington County Public Health's COVID-19 contact tracing efforts like "Resource Coordinators" who will work remotely to conduct a virtual needs check and connect at-risk COVID-19 positive patients and people in quarantine to community resources.<sup>[18]</sup>

**Health Tracker**

In order to contain the spread of the COVID-19 pandemic, the ICT Division, Government of Bangladesh, has released a smartphone app (beta) for the citizens of the country. The app utilizes Bluetooth and the latest technology to notify 'At-Risk' users by detecting the exposure with a COVID-19 positive user. The data collected is kept secure in-transit via encryption. When the two users come within a certain distance of each other, the users' phones will exchange "Digital Handshakes".<sup>[16]</sup> According to the database of IEDCR, 49 areas have more than 60 confirmed patients on 16 June, 2020. The ICT division and local administration are working to segregate the geographic boundary for zoning where there are 60 patients per 100,000 people in the preceding 14 days.<sup>[19]</sup>

**CONCLUSION**

This is the time for all public health experts to redouble the efforts to communicate the best information to those seeking a trusted and reliable source. Everyone will try to continue to share emerging science, best-practices and policy shifts related to COVID-19. And, because COVID-19 may intensify other gaps in public health systems and infrastructure, everyone should try continue to share other important public health news, research and policies and help in spreading COVID-19 related information.

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