Plianbangchang, S / J Health Sci Altern Med (2019) 1(1):1-3
DOI: 10.14456/jhsam.2019.2

Journal of
Health Science and Alternative Medicine

Special Article Open Access

Public Health in the Digital Era: An Overlooked Public Health Issue

Samlee Plianbangchang[1, *], M.D., Dr.PH.

[1]*Former Director, World Health Organization for South-East Asia Region, New Delhi, India*

Received March 17, 2019
Accepted March 31, 2019
Published April 29, 2019

*Corresponding author: Samlee Plianbangchang. M.D., Dr.PH., College of Public Health Sciences, Chulalongkorn University, Bangkok, THAILAND

e-mail: samleep40@gmail.com

ABSTRACT

Public health in the digital era is a significant aspect and important challenge for all public health professionals. Public health innovation, technology, and information are accelerating the advanced technique to improve the understanding of social, economic and political determinants of health; and these technologies are used for a population's health improvement. Today, several modified/improved technologies are used to support public health professionals to achieve the availability, affordability, inter-activity, accessibility and portability of access to health care systems of a population. Therefore, in digital 4.0 era, we as public health professionals need to improve our perspective and skill to use these advanced and suitable technologies to support our missions to maximize population health utilization and benefit.

Summary

The "Digital Era" is characterized by the development of information and communication technology with the increases in speed and breadth of "knowledge turn over" within the society [1]. In the system we live, sustainability of gains from our development efforts rely very much on knowledge turnover. Faster knowledge turnover is advantageous, as new knowledge is more frequently produced and added, allowing for organizations to timely adapt to the changing surrounding environment.

The social implications of the development in digital era are huge and will increase as the advances in technological functionality become more "knowledge–based" [2]. Understanding the digital era in terms of its evolution will help ensure the balance and sustainability between socio-cultural and economic developments. Which positively impact on advancement in the development and innovation of holistic interventions in public health. In public health work, information systems are indeed vital, they help public health practitioners collect, store and use data that drive the outcomes of such interventions. For years before and during the "digital era", public health agencies have faced daunting challenges in managing information systems to ensure effective support to public health work.

The growing demand for enhanced electronic exchange of data for information use creates a compelling need for concerned agencies to critically assess their key information needs and management capabilities, and they proceeded to developing a toolkit for improvement of public health information systems. That is the start of "public health informatics", it is the systematic application of information and computer science and technology to public health practice, research, and learning [3]. The informatics is intended to help identify the specific requirements needed for current information systems to better support public health functions. These functions include, among other things, the broad areas of epidemiological investigation and surveillance, disease prevention and control, emergency preparedness and response, health promotion and health maintenance.

Public health informatics and related population informatics together work coordinately on several issues of information and communication technology from the perspective of health of the entire population or health of groups of individuals in community. Informatics is an applied information science that designs the blueprints for the complex data systems that keep specific information available, secure, usable and responsive to the users' needs [3].

Various stages of development in the digital era, which come along with the development of informatics, have greatly advanced the information management and use in public health work. These stages are from the development of Internet connection and website, through the use of social media and social network, as well as data application on smartphone. These developments have also contributed greatly to the

ways people taking actions on the care of their own health.

A range of digitized health promotion practices have emerged during the digital era. Some of these practices are voluntarily undertaken by people themselves who are interested in improving their own health and well beings, with particular attention to problem interventions [4]. But, some other practices in digitized health promotion are employed in the interest of agencies to render specific services in areas of health improvement and health maintenance. It should also be aware that many digitized health promotion strategies focus on individual responsibility for health, but fail to recognize adequately the psychosocial, cultural and political implications of their use.

At the same time, there is increasing blurring (no clear demarcation line) between voluntary health promotion practices, professional health promotion, government and corporate strategies for health promotion. These areas of haziness require our due attention and acknowledgement of its implications in their implementations. There is also increasing influence of digital media corporations over digital technologies and the data they generate, which may not be developed with adequate transparency and fairness. These issues provoke questions for health promotion in general, which is a practice, as well as health promotion as a field of research and development, that hitherto have been little addressed in information system development.

The advent and appearance of the internet technology did lay down foundations for the new information revolution in the digital era [5]. It is the rise of the smartphone that really revolutionized electronic communication toward exponential increase in the use of internet technology. According to a report of "We are Social Media and Hot Suite", over half of the world's population owns a smartphone. And about 1% of all the searches done on smartphone or Google are health related. While this 1% even represents a huge figure of millions of searches. This means that people are more and more inclined toward educating themselves on health matters, or at least they search online for different solutions for their health.

Nowadays, we have to recognize that everything or most of things in the area of information and communication is affected by the digital progress and revolution. The opportunities for "interdisciplinary digital health research and development" bring computer science to dramatically improve health and well beings of individuals and population through various means of public health intervention [5].

The recent technological breakthroughs made it possible by creation of real–time big data streams, social media, participatory and context–awareness systems, as well as infectious disease modelling are the focus of public health information management [6]. These technological advances are also addressing acute information needs of natural and manmade disasters to leverage opportunities for improving the development of community resilience, early warning and response to the emergency situations. Technologies developed in the digital era are allowing us to be more connected, and with greater access than ever before to data and information as needed. And we may be able to say that mobile phones have now become the most widely adopted communication technology in human history.

The digital public health, and in particular, mobile health–the use of electronic mobile communication and devices for achieving public health outcomes–is now at a tipping point [6]. Mobile communication has some unique assets–not least–availability, affordability, inter-activity, accessibility and portability. These assets open up new possibilities for supporting people to protect and improve their health more efficiently and cost-effectively. New technological developments and advancements affect almost every aspect of our daily life, including in the areas of healthcare-promotive, preventive and curative [7].

However, successful adoption and sustainable integration of e-Health and Telemedicine in public health strategies depend a lot on the relevant knowledge; and the constant assessment of consumer's needs, proficiencies, and preferences. Technologies known as "Health apps", has a great potential to improve individual and community health as said; and importantly, the Health apps contribute efficiently and cost-effectively to the prevention of lifestyle diseases, most of them are chronic and non-communicable [8]. Therefore, these technologies really build an important pillar of public health strategies and approaches, which take into account the "Social, Economics and Political Determinants of Health". Healthcare providers could take advantage of consumer–oriented health apps to assess individual needs of specific target groups, such as elderly people.

With the accelerated development of health technologies over the past decade, both patients and care providers have entered a particular period, in which much of our information is stored, processed, transmitted and utilized digitally [9]. We have become more and more dependent on digital technology to access and receive care, in health or otherwise; and the providers of healthcare rely on it to diagnose and deliver treatment services to people. This rapid progress in the development of communication technology has gone beyond the confines of hospitals and clinics, and the progress has moved health technology into the patients' hands and homes. With this trend of contacting points, which has turned "digital", we are able to communicate and access health information from the comfort of our living room.

With modern health technologies, we carry devices on our bodies to monitor and mitigate our medical conditions at any time, any place. or we bring our smartphones to track and share our workouts, and collect our vital signs as part of our daily routines. There are mobile apps that help us monitor our sleep, manage

our stress, calculate our insulin doses, and remind us to take our medications.

However, at another angle, a manufacturer's rush to market, or their lack of adequate concern about the possible risks of those devices on security and privacy; such risks have often become an afterthought. And the users of those technologies have become at risks, or the victims of development. We must be fully aware and play important roles in protecting the confidentiality of our digital health footprints, to ensure that technologies are used to our benefit and cannot be used against us. This is in the same way as we protect our personal and financial information.

Some of the best features in today's health technologies are their "ease of use" and "portability", which in so many cases require the internet connection and a Smartphone to enable them. With these advantages mobile phones and applications have increasingly become some of the favorite targets of "hackers" who can steal our personal information for illegal use, because a smartphone is a mini–computer with superpowers. It has a Microphone, a Camera, a GPS, and Antenna to connect from anywhere. And most importantly, it contains so much of your personal information, including telephone numbers, addresses, e-mails, photos, contact and access to your bank accounts and credit cards, and so on. This is a dangerous combination, if not secured properly [10].

With health and wellness technologies, we as users have a great responsibility for what we choose to use, and where we deposit and share our personal and health information. These technologies may hold and transmit our information in the wrong hands that could potentially be used to harm us in many ways. We are now very much in the period of technology applications and big data management, whereby social media and social network play the key role to facilitate the ease of such applications.

In the digital era, as we are also aware that we are entering the "Digital 4.0". We are attempting to do our work through the use of "machine to machine", reducing human role in the process, by increasing the use of "Artificial Intelligent (AI)", developing "tools or machine with brain" to replace human labor in the workforce [8]. Machines with intelligence or brain will communicate and work together automatically without operational control from man. However, in this regard "human intellectual potentials" will have to increase to ensure that man can think beyond the current limit of their abilities toward the creation of more "new things", and ability to control them. Development of machine with brain is with the purpose to change routine service to higher value service, to change SME to Smart Enterprise; and to focus more attention of organizations or enterprises to consumers' needs and requirements as the main target of their services [11].

Now, there is a lot of research work for the development and application of AI and machine with Brain. Indeed, it is a very challenging development at this point in the digital era. We already have heard about the use of many AI applications in the medical field, especially in the curative area. However, we are yet to hear more about the applications of AI in public health field, that is in the broad areas of health promotion, health protection and health maintenance. Whatever and however, we must always keep in mind in this regards that AI and machine with brain are made by man, and man must be able to handle them effectively for the benefit of mankind. This is with the condition that man in future must have excellent health with superior brain and superior intelligence to ensure their superpower over AI and machine with brain or robot in the future.

References

[1] Social and Economic Transformation in the Digital Era (/book/social-economic–transformation–digital–era/905), 2004, page 18.

[2] Digital 4.0 era, while global moving by technology- WICE logistics public company Limited ; http://www.wice.coth/2018/01/11/digital-4-0-technology/

[3] Public Health in the Digital Era, Part 1, O' NeilInstitate 06.05.14; http://www.oneillinstituteblog.org/public-health-digital–era–part–1

[4] Health Technology in the Digital Era – Benefits and Risks, December 21, 2017; https://staysafeonline.org/blog/health-technology-digital–era–benefits–risks/

[5] WIKIPEDIA, Information Age; https://en.wikipedia.org/wiki/information_Age

[6] Public Health – Wikipedia; https://en.wikipedia.org/wiki/public_health

[7] Health Promotion International, Oxford Academic; https://academic.oup.com/heapro/article/30/1/174/2805780

[8] Public Health Informatics Profile Toolkit; https://www.phil.org/PHI-Toolsit/introduction

[9] Artificial intelligence – Wikipedia; https://en.wikipedia.org/wiki/Artificial_intelligence

[10] Digital Health 2017 : Global Public Health, Personalized Medicine, and Emergency Medicine in the Age of Big Data (2-5/7/2017); https://www.nel.ac.uk/digital-health-events-events-pub/digital–health–2017

[11] Digital age and the public health perspective; Prevailing health app use among Austrian Internet users; https://www.ncbi.nlm.nih.gov/pubmed/29256715