Public Health: Recent Developments in Technology

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Abstract:

The right to health is an essential component of human dignity, and it is the responsibility of governments to ensure that this right is protected and promoted for all individuals. The COVID-19 pandemic has ushered in rapidly evolving developments in digital health care, and governments around the world are experimenting with different ways of introducing technological tools in the management and delivery of health care services.

Health care has changed dramatically due to advances in technology, from anesthesia and antibiotics to MIR scanners and radiation therapy. Future technological advances will continue to transform health care and while technology (new drugs and treatment, new devices, new media to monitor health care etc.) will drive innovation, the human factors will remain one of the biggest barriers to innovation.

Through use of innovative technology in health care, we hope to provide an updated and holistic healthcare for care seekers and consequently increase their quality of life. This state of art centre will serve prudent efforts in providing high-quality and affordable healthcare for all sections of the society. Equipped with the latest technologies and healthcare practices, it helps in providing the best of diagnostics and treatment at affordable prices. Technology drives health care more than any other force and will continue to change in the future.

Key words: Public health, Health care, Technology, Artificial intelligence, Drugs, Treatment

I.   Introduction:

Healthcare technology refers to any IT tools or software designed to boost hospital and administrative productivity, give new insights into medicines and treatments, or improve the overall quality of healthcare provided.

Today's healthcare industry is a $2 trillion behemoth at a crossroads. Currently being weighed down by crushing costs and red tape, the industry is looking for ways to improve in nearly every imaginable area. That's where healthtech comes in. Tech-infused tools are being integrated into every step of the healthcare experience to counteract two key trouble spots ie. quality and efficiency.[1]

Public health's primary goals focus on protecting and improving the health of communities. Public health technology helps reach these goals with greater efficiency. When applied to public health situations, tech provides public health professionals with advanced tools to obtain accurate, detailed population data in real time. This data can help them build more effective actionable health strategies covering a range of scenarios, from individual care strategies to coordinating support systems that can address widespread disease outbreaks.

II. Benefits of Healthtech:

Healthtech has the potential to trim the fat from our traditional healthcare scene. Skyrocketing costs, unbearable wait times, inefficiencies in drug development and limited access to insurance and healthcare providers are all being improved (or at least addressed) through tech-infused care.[2]

1. Healthtech Improves Efficiency:

The way we purchase healthcare is becoming more accessible to a wider group of people through the insurance technology industry, sometimes called insurtech. Patient waiting times are declining and hospitals are more efficiently staffed thanks to artificial intelligence and predictive analytics. Even surgical procedures and recovery times are being reduced thanks to ultra-precise robots that assist in surgeries and make some procedures less invasive.

2. Healthtech Promotes Quality Care:

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[1] https://builtin.com/healthcare-technology Visited on 14-12-2023

[2] *Ibid*

Expanding access to healthcare and improving hospital operations is fantastic, but how exactly are innovators accomplishing this feat? Healthcare technology companies have provided a much-needed jolt of efficiency by tailoring experiences to the individual. These companies realize there's no one-size-fits-all approach to proper care, so customization is key. By personalizing everything from insurance payments to diets and sleep patterns, healthtech companies are working to improve human health and reduce much of the unnecessary strain on the industry.

III.   Use of Technology and Public Health:

Technology encompasses everything from life-saving devices to data-gathering tools, meaning that the synergy between technology and public health is multifaceted. While the following examples demonstrate this interaction in vastly different ways, they are all united by the goal of improving community health.[3]

1. Geospatial Technology:

Geospatial technology has a range of health care functions, but perhaps one of its most interesting might be its ability to provide information that can help improve public health. Geospatial technology collects information about several factors, analyzes the data, and displays the results on a multilayered map.

For example, geospatial tech can provide in-depth information on disease penetration within a specific region, health risks by age demographic, care delivery logistics, and other social factors that influence population health. These multilayered maps can inform and educate professionals and the community about an area's true state of health care and allow decision-makers to improve the locations they govern.

Geospatial technology's functionality and purpose quickly rose to greater prominence during the COVID-19 pandemic. Shortly after the corona virus started to spread throughout the nation, public health officials turned to geospatial technology, performing contact tracing to identify individuals who may have been exposed to the potentially deadly disease. This methodology enabled public health officials to develop and recommend flexible strategies designed to slow the viral spread.[4]

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[3] [Public Health Technologies Changing Health Care Delivery | Online Masters in Public Health](#) visited on 14-12-2023

[4] *Ibid*

2. Twitter Monitoring:

Twitter has much more to offer than celebrity gossip and enticing food photos. Health care professionals are using the popular micro blogging platform to monitor the spread of infectious diseases, including COVID-19, and predict disease activity. During flu season, researchers at universities across the country analyze millions of tweets containing the word "flu." These researchers have found Twitter to be a more accurate monitoring tool for the disease than those used in the past, such as public laboratories and Google searches.

According to health experts, the real-time information gleaned from Twitter is also more useful because it is timelier. By receiving information nearly earlier, researchers can more accurately chart disease activity. Doctors can also access the information to make better treatment decisions during a health epidemic.

3. Wearable Technology:

Wearable fitness bands allow users to easily track their movements throughout the day. Metrics such as total steps taken, heart rate, run or ride pace, or the amount and quality of sleep each night help individuals better identify, track and achieve their own health and fitness goals.

For those who choose to regularly use a wearable monitor, this information can serve as a reference point when communicating with health care providers about general wellness goals or other health markers. Health insurance providers have also taken notice and have built incentive programs to encourage the use of wearables. For example, United Healthcare's United Healthcare Motion program provides its members the opportunity to earn money toward out-of-pocket medical expenses by reaching walking goals, a metric that can be monitored with a wearable device.

Beyond fitness, wearable technologies are advancing to monitor vital statistics such as a user's heart rate, lung function, blood oxygen level and blood sugar. They are even being developed to track and alert the onset of degenerative conditions such as Parkinson's or Alzheimer's disease. A user could have the level of medication in their blood regularly monitored according to a physician's plan and be reminded to administer their next dose when its level drops below a certain threshold.[5]

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[5] *Ibid*

4. 3D Printing:

3D printer technology enables medical professionals to produce patient-specific anatomical models that exactly replicate a trouble spot inside a patient. Surgeons are then able to physically handle the models, examining them and simulating a variety of possible procedures to bring a better-informed solution to the operating room. This not only enhances the team-based training environment, but also allows for more specialized, personalized and precise treatment plans improving health care quality and reducing costs.

Other examples of 3D-printed body parts include a functioning artificial ear from scientists at Cornell University, blood vessels from researchers at the University of Pennsylvania and Massachusetts Institute of Technology, skin cells at Wake Forest University that can be printed directly on wounds, and a 3D-printed liver produced by the private company Organovo.

3D printing also became a vital asset in the public health response to the COVID-19 pandemic. A host of 3D-printed devices and tools have been created to alleviate supply chain shortages, from swabs used for COVID testing to splitting devices that enable multiple people to use a single ventilator.

5. Telehealth

Cell phones, mobile devices and PCs are helping connect patients with their practitioners. People too ill to attend a clinic, without adequate transportation or without spare time can video conference with a trained health care practitioner through apps such as Doctor on Demand and Now Clinic. Additionally, all of the health insurance industry's major players offer some form of telehealth in their health coverage options.

The rise of mobile health, or mhealth, has significant implications not only for the United States, but also the developing world. Data amassed by Pew Research indicates that around 5 billion people worldwide have mobile devices, more than half of which are smart phones. This provides encouragement that telehealth may have the capacity to reach patients that traditional forms of health care do not.

IV. Recent Developments in Public Health and the Road map ahead:

Recently, there have been significant developments in public health around the world. These developments resulted in better health outcomes, reduced mortality rates and increased

life expectancy for people of all ages. This article aims to explore some of the major developments in public health and their impact on individuals and communities around the world.

One of the most important achievements in public health is the eradication of smallpox. The virus caused severe illness and caused death of millions of people worldwide. However, through a coordinated effort involving vaccination campaigns, surveillance, and containment efforts, smallpox was eradicated in 1979. This achievement marked a major milestone in modern medicine and inspired similar efforts to combat other infectious diseases, such as polio and measles.

Another significant achievement in public health is the development of vaccines. Vaccines have played a crucial role in preventing and reducing the spread of infectious diseases. Vaccination campaigns have been instrumental in reducing the incidence of diseases such as measles, polio, and cholera. Advances in vaccine technology have also led to the development of new vaccines for diseases such as Ebola, HPV, and COVID-19, providing protection against these diseases and reducing their impact on individuals and communities.

Advancements in healthcare systems and infrastructure have also had a significant impact on public health. Improved healthcare systems, quality health services, including preventive care, diagnosis, and treatment has resulted in better health outcomes, increased life expectancy, and reduced infant and maternal mortality rates.

Most importantly various health financing initiatives taken by different countries like Government funded health insurance schemes, free primary and preventive care, health vouchers, patient assistance programs etc. have been instrumental in making the above mentioned healthcare services accessible and affordable for the populace.

In addition, technology such as telemedicine and mobile health has made it easier for people in remote or underserved areas to access healthcare services. Such services have gained much popularity and have been a boon during and after COVID 19 pandemic.

Programs focused on promoting healthy lifestyles, such as smoking cessation, staying active and healthy eating, have also helped in reducing incidences of chronic diseases such as obesity, hypertension, diabetes and other heart diseases. Other than the these education campaigns aimed at increasing awareness of health risks and disease prevention have also helped reduce the burden of infectious diseases.

In global health context, international cooperation and collaboration have been crucial in advancing public health worldwide. Various international organizations have played a key role in coordinating efforts to combat infectious diseases, improve healthcare systems, and address global health issues. This cooperation has enabled countries to share information, resources, and expertise, leading to better preparedness and cross learning across various fronts of healthcare.

Despite the significant advancements in public health, there are still many challenges that need to be addressed. In low-income countries, availability and access to quality healthcare services still remains a challenge, and infectious diseases such as tuberculosis and HIV/AIDS continue to be major health threats. In high-income countries, chronic diseases such as obesity and diabetes are on the rise, and mental health issues are becoming more prevalent.[6]

To address these challenges, there needs to be a continued focus on improving healthcare financing, robust healthcare systems, promoting healthy lifestyles, and investing in research and development. In addition, international cooperation and collaboration must continue to be a priority to address global health issues such as pandemics and emerging infectious diseases.

V. Conclusion:

In conclusion, innovation and development in public health have had a significant impact on the lives of people across the world. The eradication of diseases, the development of vaccines, improvements in healthcare systems, introduction of healthcare financing instruments, public health campaigns, and international cooperation have all contributed to better health outcomes, increased life expectancy, and reduced mortality rates.

Smart technology in healthcare is changing the game in more ways than one. With more monitoring treatment options available to more people, physicians can use data, AI, and other innovative new tools to make a more proactive, data-driven approach to healthcare.

However, there is still much work to be done to address the remaining challenges and ensure that everyone has access to quality healthcare services and the opportunity to live a healthy life.

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[6] https://timesofindia.indiatimes.com/readersblog/msdoc/advancements-in-public-health-and-the-road-ahead-52102/ visited on 11-12-2023