

Digital Health: Gaining Momentum From a Global Pandemic

With Dr Nadia Tsao, Senior Technology Analyst



Copyright © IDTechEx. Use in accordance with distribution licence | www.IDTechEx.com





Digital Health & Artificial Intelligence 2020

Telehealth, telemedicine, remote patient monitoring, digital therapeutics, genetic testing, smart home as a carer & AI in medical diagnostics



Exponential growth of health data drives digital health and Al in healthcare.

> www.IDTechEx.com /DigitalHealth



IDTechEx provides clarity on technology innovation

- Technology assessment
- Technology scouting

- Company profiling
- Market sizing

- Market forecasts
- Strategic advice



Reports | Subscriptions | Consulting | Events | Journals | Webinars



The Scope of Digital Health

Digital health encapsulates a wide variety of technologies and services which together enable the gain of valuable healthrelated data from individuals. This data can then be analysed and the resulting information used to offer healthcare technologies and services which lead to improved outcomes.





Changing Demographics Require Healthcare Reforms



Growing by 56% to **1.4 billion in 2030**

90% of the US's healthcare spending

Growing to **8.5 billion in 2030**

65% of the global population







Copyright © IDTechEx. Use in accordance with distribution licence | www.IDTechEx.com



Digital Health Rises to the Challenge

As COVID-19 spread around the world, one of the key public health measures that has been deployed in countless countries is the lockdown. Though countries differed in strictness, their main purpose is to stop the movement of people, and thus stop the chain of infection. Put more colloquially, the intention is to "flatten the curve".

In today's webinar, I will address how the digital health technologies have been deployed to address some of the issues caused by either COVID-19 or the public health measures. The topics I will be discussing are:

- > Telemedicine
- Remote patient monitoring
- Digital therapeutics
- > AI image diagnostics

Copyright © IDTechEx. Use in accordance with distribution licence | www.IDTechEx.com



There are Numerous Types of Telemedicine

	•))		
Live Video Conferencing	Store-and-Forward (Asynchronous transfer)	Remote Patient Monitoring (RPM)	Mobile Health (mHealth)
 Patient and healthcare provider use two-way conferencing for real-time consultations. Often used to treat common illnesses, assist with triage decisions and with psychotherapy sessions. 	 Patient's record or data is transmitted to a healthcare provider electronically for treating patient outside of real-time. Commonly used in rural areas for primary care providers to send data to specialists at another location for consultation and analysis. 	 Patient's health and medical data is sent in real-time for monitoring. Effective in the senior health industry. 	 Use of any mobile communications device, as well as software applications to support healthcare.



Telehealth and Telemedicine are Poised for Take-Off



Copyright © IDTechEx. Use in accordance with distribution licence | www.IDTechEx.com



Telemedicine: Changes Due to COVID-19

Existing Hurdle

<u>COVID-19</u>



Copyright © IDTechEx. Use in accordance with distribution licence | www.IDTechEx.com



Telehealth Companies and COVID-19

Physicians have turned to telehealth due to the COVID-19 crisis, utilizing video conferencing tools. Patients have also turned to telehealth services in vast numbers, resulting in significant growth in revenue and patient volumes.

🤣 amwell'	 Up to 400% uptick in patient visits \$194 million raised in Series C Plans to file for IPO
Teladoc. HEALTH	 \$180 million in Q1, +41% yoy Up to 92% increase in visits in Q1, some 300x increase in March
O omada	 \$57 million raised \$30 spent to acquire Physera
Livongo [®]	 \$68.8 million in Q1, +115% yoy 380 new clients in Q1, +44%

Copyright © IDTechEx. Use in accordance with distribution licence | www.IDTechEx.com



Remote Patient Monitoring

Remote patient monitoring (RPM) leverages a range of technologies and services to allow for the monitoring of patients both inside and outside of conventional clinical settings.

RPM measures things such as medication tracking, temperature, movement, HR, BP, glucose levels and oxygen levels.

Applications of RPM include monitoring and improving patient adherence, clinical trial monitoring, pre/post-op monitoring, and monitoring diabetes, dementia, infertility and heart failure.

Benefits for patients, providers and payers increase the likelihood of take-off.





Can Smartwatches Track COVID-19 Symptoms?

Your wearable might be an early warning system for viral illness

A health study conducted by

Scripps Research

Harnessing wearable device data to improve state-level real-time surveillance of influenza-like illness in the USA: a population-based study

Jennifer M Radin, Nathan E Wineinger, Eric J Topol, Steven R Steinhubl

Summary

Background Acute infections can cause an individual to have an elevated resting heart rate (RHR) and change their routine daily activities due to the physiological response to the inflammatory insult. Consequently, we aimed to evaluate if population trends of seasonal respiratory infections, such as influenza, could be identified through wearable sensors that collect RHR and sleep data.

 SH
 Stanford Healthcare

 Innovation Lab

HOW DOES IT WORK







Collect Data

Our research at Stanford Medicine in 2017 shows health data colleted from wearables can help detect infectious illness days before symptoms emerge.

Establish Baseline

With your consent, we will collect your health information via daily survey and wearable devices for days to estabilish a baseline for detecting COVID-19.

Predict & Protect

Our algorithm picks up abnormal patterns that deviates from your baseline to predict and detect possible infections.





Digital Therapeutics: App-Based Healthcare

Digital therapeutics is primarily concerned with the treatment of a condition in a digital manner. However, it is not limited to this and can also include the diagnosis and monitoring of patients. Other commonly used terms for digital therapeutics include 'software-as-a-medical device' (SaMD) and 'digiceuticals'.

Digital therapeutics has essentially been enabled by the use of artificial intelligence and machine learning in combination with technology being cheap enough to put into the hands of consumers.

The apps are intended to be prescribed, and as such are subject to regulations by bodies such as the FDA unlike most other health apps. Platforms may be tied to sensors or wearables to enable targeted therapeutics based on data readings and analytics.

The apps can incorporate such things as analytics in the form of algorithms, tips, a support network, gamification and stress reduction.



Slide 14

IDTechE

Mental Health is a Key Focus for Telehealth and DTx

Studies have shown that over half of telehealth visits in the US between 2005 and 2017 were for mental health. These digital visits bring convenience and discretion to patients and have resulted in concrete savings. Cigna reported that it has saved 17% in medical costs and seen a 36% decline in emergency department use for their mental health patients.

Mental health issues to be addressed includes depression, stress, worry and anxiety. Digital therapeutics have emerged as a particularly elegant solution to addressing mental health as evidence-based cognitive behavioral therapy can be easily delivered in the form of a smartphone app.

Outside of digital therapeutics for mental health, the use of digital tools in addressing these problems, such as apps that easily connect users to a mental health professional or to mental health support groups, are also on the rise. By addressing the issue of mental health in today's working population companies can not only reduce healthcare costs but increase work productivity significantly.





Mental Health and COVID-19

The stress of the pandemic and the effects of isolation during the lockdown have driven more and more people towards telehealth for their mental wellbeing.

On April 14, the US FDA relaxed their regulation of DTx, stating that the FDA will not object to the use of uncleared digital health devices for the treatment of psychiatric disorders during COVID-19.





- Received FDA authorization for SOMRYST on Mar 26
- > Temporary and limited access to Pear-004 for schizophrenia
- App had not reached clinical trials stage before COVID-19
- Rolled out Endeavor (AKL-T01) for children with ADHD
- Tested over 600 children in 5 clinical trials
- FDA Cleared and CE Marked June 2020



AI in Medical Imaging

The evolution of computing has given machines the ability to perform tasks and analyse facts independently of a human.

Thanks to Al's ability to extract information, recognise patterns and analyse data much more efficiently and quickly than humans, the use of AI and ML in medical imaging is rapidly growing.

Al is being explored as a means to render the imaging process more efficient and to streamline the analysis process. It has the potential to refine diagnosis methods and minimise time to treatment, thus improving patient experience and outcome.

As of May 2020, there are 67 FDA-cleared AI-driven technologies for the analysis of medical images.



Useful features of AI for medical imaging Source: IDTechEx

Slide 17



Al Image Recognition for COVID-19: Key Players







AI Image Recognition for COVID-19: Performance

The top right corner represents ideal performance (perfect sensitivity and specificity).



Algorithm performance comparison

Company	Sensitivity	Specificity
RADLogics	0.98	0.92
Wuhan EndoAngel Medical Technology Company	0.94	0.99
Shenzhen Keya Medical Technology Corporation	0.87	0.92
YITU Technology	0.97	0.99





Outlook for Digital Health

As stakeholders look for cost-effective ways to deliver patient-centred health care which is outcome driven, numerous requirements need to be met for digital health to succeed, including:

Engaging with consumers and improving the patient experience	
A strategic move from volume to value	
Working swiftly with health policy and complex regulations which a	are changing
Treading a path through an uncertain health care market and char	nging health economy
Investing in innovative technologies and services which reduce co and improve care	sts, increase access
Shaping the workforce of the future	

Copyright © IDTechEx. Use in accordance with distribution licence | www.IDTechEx.com





Digital Health & Artificial Intelligence 2020

Telehealth, telemedicine, remote patient monitoring, digital therapeutics, genetic testing, smart home as a carer & AI in medical diagnostics



Exponential growth of health data drives digital health and Al in healthcare.

> www.IDTechEx.com /DigitalHealth



Related Reports



Copyright © IDTechEx. Use in accordance with distribution licence | www.IDTechEx.com



Research Reports

IDTechEx



Healthcare

- 3D Bioprinting
- Advanced Wound Care Technologies
- Bioelectronic Medicine
- Biomedical Diagnostics at Point-of-Care
- Cardiovascular Disease
- COVID-19 Diagnostics
- Digital Health and Artificial Intelligence
- Electronic Skin Patches
- Flexible Electronics in Healthcare
- Innovations in Robotic Surgery
- Invasive and Non-Invasive Neural Interfaces
- Molecular Diagnostics
- Neuroprosthetics
- Piezoelectric Harvesting and Sensing for Healthcare
- Remote Patient Monitoring
- Synthetic Biology
- Technologies for Diabetes Management
- Tissue Engineering





Supporting your strategic business decisions on emerging technologies

Dr Nadia Tsao – Research@IDTechEx.com

Research

IDTechEx conducts detailed examinations of emerging technologies, which are delivered through our Market Research Reports and Subscription services.

Consulting

Our expert analysts deliver custom projects which identify markets, appraise technologies, define growth opportunities and perform due diligence.

Events

IDTechEx conferences and tradeshows match end users with the latest innovations, providing networking, sales and knowledge sharing.

Offices: Americas (USA): +1 617 577 7890 Asia (Japan): +81 3 3216 7209 Asia +886 9 3999 9792 Europe (UK): +44 1223 812300 Copyright © IDTechEx. Use in accordance with distribution licence | www.IDTechEx.com Slide 24