

The Newest Doctor in Town

Angelina Busetto

Introduction

If someone told you on New Year of 2020 that there would be a global lockdown to prevent the spread of a deathly disease that made people lose their sense of taste and smell, you might look at them as if they were mentally unstable. But that is the harsh reality that struck the world in March of 2020 when the way we imagined not only our lives, but healthcare changed forever.

Our world's healthcare systems were challenged to combat the pandemic of COVID-19. Ill-equipped to do so by no fault of their own, hundreds of thousands contracted the disease and began to die because of it. Not only was there a lack of PPE (personal protective equipment) and tools, but there was a lack of personnel to help care for those who tested positive for the disease. Patients both in and out of hospitals struggled to get in contact with doctors and health care professionals regarding everyday illnesses as they were occupied treating those with the most serious symptoms.

For this reason, many people turned to the internet and new health apps to help understand not only COVID but people's day-to-day healthcare needs. AI mobile health app start-ups burst forth trying to help minimize the stress on the healthcare systems. Millions of dollars were invested in them with the hopes that they could assist people with their health and be an outlet for those seeking immediate medical direction and care.

Patients were faced with a radical transition from talking to doctors and nurses who had years of experience in the field to then being treated by a robot. Besides issues of legality that these apps faced in their roll-out, there are accuracy and liability fears when using artificial intelligence

to determine outcomes of people's health. More simply stated: the AI was in control of life or death for people. Who is to blame when they misdiagnose you or suggest the wrong thing?

Background

The development of mobile health apps brought about large success as COVID surged because they became more reliable and efficient for people's everyday demands. The market itself was "expected to hit \$28 billion by 2023" and by then "two-thirds of the world's largest hospitals will offer mobile apps to their patients"¹. As of 2021, the top five AI-powered diagnostic symptom checkers include Ada, Buoy, Isabel, Symptomatic, and the WebMD Symptom Checker². These actors in the industry have gained a lot of traction in recent years as apps continue to grow their platforms to promote easy healthcare for all.

Albeit not one of these apps surpassed a diagnostic accuracy of 80% with the highest accuracy being 77% and the lowest coming in at 52%. Given that apps are not required to include medical professionals on their teams nor "validate the data contained within the program for medical accuracy or functionality"³ it is understandable why apps have low accuracy levels.

Sitting with 77% accuracy is Ada, "a personalized health companion that helps you learn about your symptoms and guides you to the next step based on your needs"⁴. The app available for download on both Android and iOS launched in 2016 and has gone on to raise almost \$70 million in the first year of its launch. Built by an entrepreneur, a neuroscientist, and an NHS doctor in 2016 Ada is a London and Berlin-based health tech startup that was originally imagined to assist on the doctor's end of healthcare.⁵ Instead, it now services the consumer end of healthcare helping patients be proactive about their health and understand their symptoms without the hassle of having to go to a doctor's office.

Almost six years after its launch now in 2022, Ada has 10 million users, has completed 25 million symptom assessments, has 7 product languages, has 50 in-house medical experts, and has 250,000 5-star ratings. They have been recognized globally and have received various awards and accolades such as being rated the #1 medical app in over 130 countries and winning the AI for the Betterment of Humanity Prize.⁶ They continue to build on the legacy of their inspiration, Ada Lovelace the first computer programmer. In this way, the app pays tribute to her and continues to be a successful pioneer in the AI healthcare world as they receive numerous awards and recognition every year.

From a technical perspective, Ada works by “taking in all of a patient’s information into consideration, including past medical history, risk factors, and more”⁷. It then takes you through a “comprehensive symptom assessment, which will guide you through the process of determining what might be going on with your body” and then “provide you with a report of what might be causing your discomfort along with information on treatment options and resources”⁸.

Due to the functions of this app, it too faces broader ethical issues as most artificial intelligence innovations do. As an app that provides a diagnosis/next-step solution, there is a predictability and accuracy factor that comes into play as one of its issues. Though it is basing these decisions on millions of pieces of data and real-time knowledge of the patient, it is unable to examine the person physically or administer any diagnostic tests. All of the information provided is an observation and assumption of each patient’s actual situation. Ada also raises a liability issue as it is unknown who is responsible for the outcomes of this app and is nearly impossible to place blame on a person for a misdiagnosis or a false understanding of the situation.

Case Study

Amid the current technology era of the 21st century the internet is part of everyone's daily lives and has impacted the way information surfaces and what information people gather. Often is the case that when one does not know something or understand something they take to Google to settle their concerns. In this way, the internet can satisfy in an instant any curiosity, confusion, or worries one might have. This is in part why Ada has found so much success.

In particular, many people are quick to run to the internet with their symptoms and/or condition to educate themselves and discover preventative measures to take or what subsequent steps would be recommended to take. "But researching your symptoms online can send you down a rabbit hole that leads you to think you have a life-threatening condition" when in reality this is unlikely to be true.⁹ But now with apps like Ada, it is easier than ever to get answers to the million questions you might have once asked Google. Only this time, Ada is more knowledgeable about said symptoms you may be experiencing. But is that enough to give you an accurate result?

In a study done by BMJ Open analyzing digital symptom apps, Ada was assessed to provide a condition suggestion 99% of the time yet their accuracy rating falls only at a mere 77%.¹⁰ But that might just be the price people are willing to pay when they do not have to wait days for an appointment at a doctor's office, do not have to pay a copay, and do not have to sit in a waiting room with other sick patients awaiting help from a physician. An interesting aspect of this study, however, is that it is directly compared to statistics on human health professionals and their accuracy because doctors too get things wrong. Nevertheless, it is hardly surprising that doctors' accuracy surpassed the levels of Ada proving that changes still need to be made to the AI to ensure maximum accuracy and efficiency.

Ada also poses accuracy issues because of the way that it provides users with a result. The method Ada opts to use when suggesting a condition that a user might have is through demographic

profiling of a patient and their symptoms. “Say you are a 31-year-old woman experiencing stomach pain, for example,... it might tell you that, based on the other 31-year-old women in the database, the vast majority who reported your symptoms were diagnosed with _____”¹¹. Thus, it may contain bias based on the demographics you initially provided and then lead to further accuracy issues depending on the circumstances.

Though Ada is not as accurate as doctors, it does its best to provide an educated assessment of the likely causes of symptoms and the next steps to take to treat those symptoms. It is what some may say the “next best option” if you are unable to reach a healthcare professional. Thus, there is considerable room for growth and opportunity for this app as well as the rest of the AI mobile health app market to help advance healthcare.

This then leads to the second issue Ada presents to its consumers, liability. Specifically stated on their website, “Ada does not provide a diagnosis, and our support team is not trained or certified to give medical advice. Always consult a medical professional for diagnosis, treatment, or medical advice”.¹² Yet on the rest of the site, they boast about how their team consists of medical experts and that they “help people understand, manage, and get care for their symptoms with trusted medical expertise in minutes”.¹³ Both of these being quite contradictory statements makes it unclear whether they are confident in the services they provide or even if they take full ownership of them.

Despite this, “Ada has been CE-marked (class I) in Europe—a basic requirement to putting a medical device on the market within Europe—and complies with the EU General Data Protection Regulation (GDPR) as well”¹⁴. Yet in the United States, it seems that the FDA and the Food and Drug Administration has not approved these apps because they are not seen as a medical device.¹⁵

Since they are not seen as medical devices, the FDA does not regulate them and therefore it is up to the discretion of the user.

Another key issue Ada faces is the equity of its implementation and the focus that Ada has had on certain populations rather than others. No company ever truly intends to have a disparate impact on communities in which their product could be of greater use or has a greater need for the product. Most companies just simply do not take the time to think of this, even though they should promote the common good and create businesses that work towards the common good. The creation of Ada, clearly created to change the world, focused on serving populations surrounding its home base location.

As of 2022, Ada has expanded its communities of interest expanding outside of these two countries and now offers the app in seven different languages. “Ada is currently available in English, German, French, Spanish, Portuguese, Romanian, and Swahili” and to no surprise, they are planning to add new languages soon.¹⁶ Though this helps them reach a wider range of people, there are still numerous amounts of people suffering from health issues that are unable to use this app. They must focus on these populations to help them further engage in their mission of helping change the world of healthcare. Third-world countries that have worse healthcare systems than that of the United States and the EU could find great use of Ada and help minimize health issues globally.

While Ada does pose these concerns, there is most definitely demand and interest in growth for apps like Ada as well as for the overall market of AI in healthcare. Germany, for instance, passed the Digital Healthcare Act in 2019 which allows apps like Ada to be available on prescription, and that insurance firms will now provide these digital health services on citizens’

devices.¹⁷ It has pushed most of their healthcare system to now integrate these apps into practice allowing consumers to have access to their medical records from anywhere.

It is hard, however, to say whether all countries are moving in a similar suit to Germany as apps that involve healthcare come with previously stated risks and concerns. Nations across the world have set out to learn more about AI in healthcare including but not limited to Finland, Germany, the United Kingdom, Israel, China, and the United States all of which are investing in research related to these developments. In the specific case of Germany, health insurance is compulsory, which could have been a motivation for the passing of this law to help those who fall below the poverty line to receive medical care at a lower expense. Other countries may see this as an opportunity to do the same though it might not be fitted for all.

Altogether, the innovation of Ada and the continuous development of the service it provides prove to be a step in the direction of simplifying healthcare. Ada makes it possible to help people take care of themselves efficiently, easily, and whenever or wherever they are with the touch of a button.

Conclusion

Each of these concerns must continue to be analyzed and discussed so these apps like Ada may develop their services and continue to build the trust of the world with this new healthcare technology. They must be able and willing to attract people everywhere to support their goals and be on board with the services they offer to help improve accuracy, efficiency, and ease of healthcare for all.

Ada demonstrates the capacity to do this and more in the coming years as it continues to develop and innovate its services. It continues to be recognized globally and supported by both its users and other platforms by way of investments and other verbal acknowledgments. With the

progress that this app has seen over the first six years of its release, it shows a great possibility for more growth to combat issues of ethical and governance concerns mentioned earlier.

For these apps to continue finding success, they must gain larger public, governmental, and medical approval so that they can continually stay up to date on the way they can better treat patients. I believe that once they are endorsed by hospitals and professionals in the field they can create a competitive advantage and gain the trust of society.

In any case, it is possible that these apps also face backlash from data privacy issues that they present. Because they would ideally have access to all your health information and would have the ability to use that information for data purposes to help advance their algorithms and systems. All AI systems use consumers' data similarly to reinforce and keep their techniques reinforced of consumer frequencies.

The challenge that is raised here and continues to be raised in the world of artificial intelligence is how much data collection is too much. How much trust do people have in these companies to use their data for good? And how should companies be allowed to use this data or collect this data?

Alongside this, these apps face the most backlash because they deal with people's health as it is already a touchy topic for many to discuss and handle. Health is a more serious field to move into because of the financial, physical, and emotional issues that come along with it¹⁸. That is why these apps need to be extremely careful with the way they market themselves and do their best to watch out for their patients.

The AI healthcare industry also faces backlash because of issues other inventions have posed for the field like in the case of Theranos invented by Elizabeth Holmes. It is hard to say how this has affected the field, but it is safe to say that it has made investors and most of society more

skeptical than they would have been to use and trust inventions in AI dealing with healthcare. Since the Theranos scandal occurred in 2018 and since the start of the pandemic in 2020, health has been a hot topic and has been the cause of both physical and mental unrest. It has sparked a transition to technological innovations in the AI healthcare industry but has also challenged its progress as the world recovers from the toll that the years previous to 2022 have had on millions of lives.

This increase in AI similar to many other AI inventions threatens to take over many jobs currently held by individuals. Just as warehouses globally have transformed their staff to now be automated by the use of robots, it is possible that the healthcare world too will see a rise in robots taking over the field. What will happen to health professionals then?

Will the world be eager to transition to AI healthcare? But a more important question is, will the world of AI healthcare be able to take care of patients everywhere suffering in various experiences and maintain a trusting and helpful platform?

Equally as scared as the rest of the world, I too was anxious and scared about my health in addition to that of my loved ones when COVID began. I did not know who to listen to and what directions to follow because there were so many unknowns. The thought of looking to a health app for needed medical attention if needed was the last thing I would have wanted to do. At a time of such high fear and unknown, I was not about to put my health in the hands of AI and technology. It was no longer just short-term illnesses that would be at risk, but my life would be in the hands of brand-new technology.

However, I do not believe my opinion on the use of this technology would have changed had COVID not existed. I would personally take great precautions in using health apps because they do not provide the same comfort that any doctor or medical professional provides. For me,

there is reassurance in being medically treated by a person because I know they have been through years of training and experience. These people also provide empathy and hold the power of human connection that is lost when using AI technologies. The quality and relief of speaking with a professional are what make healthcare easier and less challenging to cope with.

Though I do believe that the development of these apps was incredibly helpful to deal with the rising concerns of COVID and other common health concerns, I am still skeptical about their capabilities to determine health outcomes and serve relatively similarly to a doctor. Other logistics that raise concern are those related to the validity of their diagnosis to use for diagnosis purposes and the liability of these apps. The ease of their creation is also alarming because there is little scientific research or research of any kind into e-health impacts and effects. Each of these details has brought me to be against the use of these apps, though they have great potential for the future.

I believe it is in the hands of the creators, government, and users of these apps to demand that they offer the highest quality service that is backed by others and guaranteed to help maintain your health and well-being. I think that it might take a long time for these apps to be fully integrated into healthcare systems, but even once integrated we take the time to use these apps in times of desperation, not as a first resort. Considering health issues will never cease to exist nor rapidly evolve, it is important we take time to invest, learn, and engage with these innovations of AI in healthcare to help live all live their happiest, healthiest, and best life possible.

Endnotes

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