The Digital Health
Engagement Institute (DHEI)

Global whitepaper on

Return on Engagement and Why it Matters

Digital Health Engagement Survey
May 2022
www.dhe.institute

Contents

Key Findings

80%

of respondents hold the view that Digital Health Engagement (DHE) Platforms add value for industry players transitioning into Insurance as a Service (IaaS) models.

67%

of respondents either have a DHE platform offering in place or are launching / planning to launch a DHE platform in the next 12 months.

61%

of respondents are of the opinion that providing a DHE platform alongside traditional insurance service will reinforce existing customer relationships.

65%

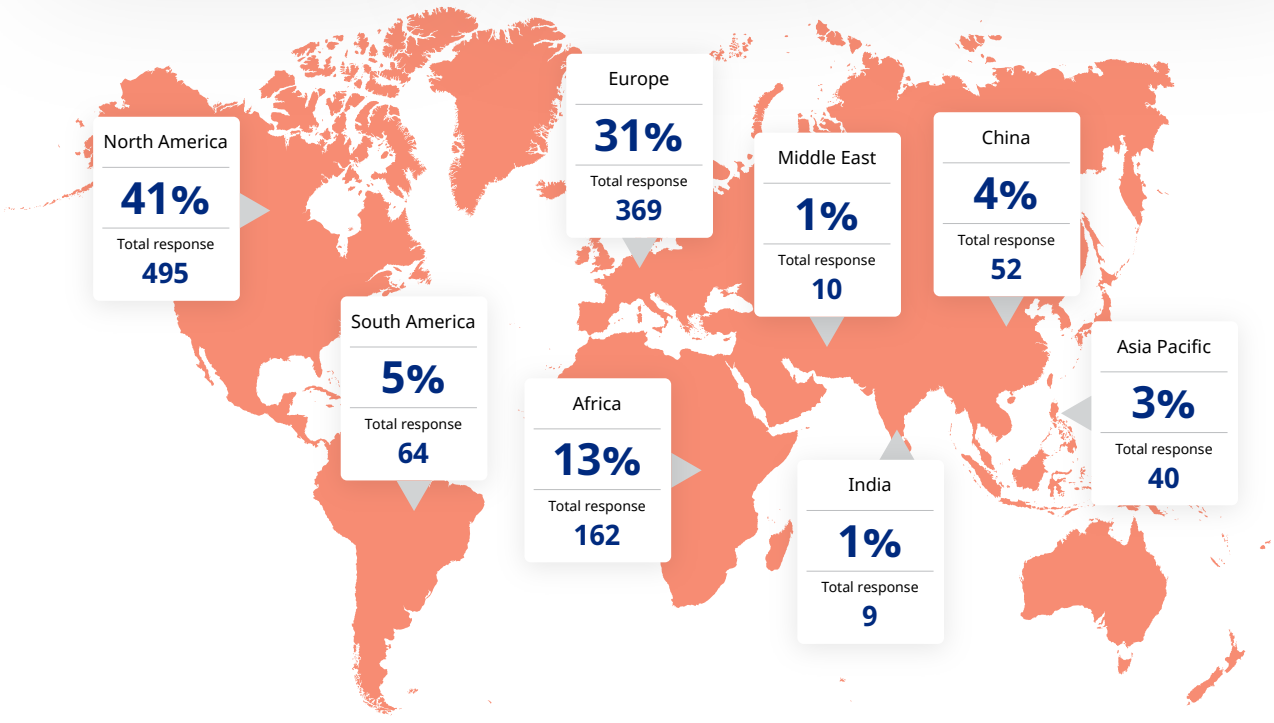
of respondents indicated the risk of inherent bias in AI systems would be of concern when evaluating a potential DHE platform.

#1 & 2

deal breakers that would stop integration of a DHE platform with own systems:
- inadequate firewalls for data privacy and security, along with lack of regulatory approval.

34%

of respondents have not yet planned to implement a DHE platform.



Participants of the DHEI Digital Health Engagement Survey, February 2022

Introduction

We launched the Digital Health Engagement Institute (DHEI) in August 2021 with the vision of becoming

> **An established institution of excellence in research among the fields of digital health engagement and wellbeing platforms.**

In this, our inaugural publication, we take the first steps towards our vision and share with you the results of the DHEI Digital Health Engagement Survey exploring the opinions and insights of insurance executives and professionals about the role and importance of Digital Health Engagement Platforms (DHE platform) in the life and health insurance industry.

As society comes to terms with the cost of living longer, we confront the key drivers challenging the financial sustainability of our healthcare system, which was mostly established around the second world war and is known as our welfare state today and advocate for the critical role DHE platforms will play in preventing much that ails us health wise. To understand perceptions of DHE platforms in the insurance industry, we launched a comprehensive global survey.

Between November 2021 and February 2022, over 1,200 participants from the Americas, Europe, Asia, Africa and Middle East were surveyed. Our questionnaire interrogated five themes: perceived value in deploying DHE platforms; concerns over data protection and privacy; ethical considerations pertaining to the use of DHE platforms; metrics used to measure engagement; and how engagement is evaluated.

Before we explore the results of the survey we provide context to these themes, touching on the concepts of *digital health and engagement*.

DHE: What's in a Name?

Digital Health

Digital health is an umbrella term describing the intersection where a broad array of technologies and healthcare meet. While there is currently no single agreed upon definition for the term due to the many different perspectives of stakeholders in the health industry, core to many of the definitions is connectivity to the internet, and the concept of the empowered consumer at home, at work and at play.

The readily available connectivity provided by mobile internet solutions separates today's digital solutions from the similar, but un-networked ones of yesterday. Connecting these previously un-networked devices (e.g., an electrocardiogram monitor) now makes them mobile.[1]

Empowered consumers are identified as a key driving force of change in the health industry. Connected to the internet with access to their personal health data, the consumer is now able to self-manage and can optimize their health and wellness.[2]

We are mindful that the current Covid-19 pandemic is at the forefront of global health care initiatives, as the world struggles to contain the spread of the virus and better manage the impact the virus has upon society.

However, no less important, and given the alarming levels global mortality rates resulting from non-communicable diseases (NCDs) are reaching, along with the associated costs, it is no surprise that:[3]

> **Optimizing the management of non-communicable diseases is one of the greatest clinical and economic challenges facing our current health systems.**

This imperative, although drawn from a report[4] exploring the potential benefits of digital health for the management of NCDs in the UK, also speaks for the world at large. The report observes that the traditional model of hospital-centric, reactive care delivery is not fit for purpose to manage NCDs, nor is it economically sustainable. Calling for new models of proactive care, digital technologies are identified as being at the heart of these models.

Estimates of the benefits to be derived from digital health where a proactive as opposed to a reactive approach to prevention and treatment is taken indicate a potential reduction in healthcare expenditure by 10 to 15%; in the same study 80% of the papers that examined digital health quantitatively came to a positive conclusion, showing an actual improved patient outcome.[5]

The rise of NCDs has been driven by primarily four major risk factors: tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets. One of the most important ways of reducing deaths from NCDs is to control unhealthy lifestyle choices that lead to their development.[6] Evidence suggests that Digital Behavior Change Interventions (DBCIs), defined as "...a product or service that uses computer technology to promote behavior change"[7] , can help people change a range of different health behaviors that contribute to these risk factors.[8]

However, the extent to which innovations in digital health can deliver on the promise of improved patient outcomes depends on the successful utilization of interventions by users and the subsequent sustained performance of the intended health behaviors. This utilization has been generally referred to as "engagement" or "user-engagement".[9]

Engagement with digital health interventions has been validated as a precondition for intervention effectiveness.[10]

Engagement

Engagement in the context of digital health can best be understood as “...a factor that strengthens or weakens the relationship between the digital health intervention and the probability of positive or negative clinical outcomes...”.[11]

Engagement is not a static phenomenon, with the user potentially passing through multiple stages of engagement as they interact with the technology (physical device, software) through which the DBCI is delivered. Engagement can be understood in two ways. Firstly, as a stage that lasts relatively longer periods, where users are constantly and actively in the "engagement stage"; and secondly, as part of the everyday flow of engagement with the technology, whether on or off, where we are not actively engaging the devices collecting our data. The foundational model of engagement (based on engagement in general) identified four stages of engagement: “point of engagement”, “engagement”, “dis-engagement”, and “re-engagement”.[12]

A more recent study into engagement focused on digital health technologies for fitness used in an individual and team-based context. The study introduced two new types of engagement being “continue to self-health manage” and “limited engagement”. In addition, four different user profiles were identified: “fitness conscious”, “technology reliant”, “technology obsessed”, and “self-aware”.[13]

By understanding a person’s stage of engagement and profile, developers of digital health engagement tools are able to create different engagement maps for different profiles, identifying how each profile interacts and engages with technology at a particular point in time. For example, in the study the following stages of engagement were identified - "engagement", "sustained engagement", "dis-engagement", "continue to self-health manage", and "re-engagement". The study identified various "attributes" that described the participants engagement with their digital health technology, e.g. technology which described how a participant is motivated to use the digital health engagement tool when the technology was what they desired. Depending upon the profile of the participant, attributes identified as motivating user engagement were then allocated (and ranked) to the stages of engagement where they were identified as influencing user engagement positively.

The value of these finding lies in the potential of bringing greater precision to the development process and the customization of digital health services for users.

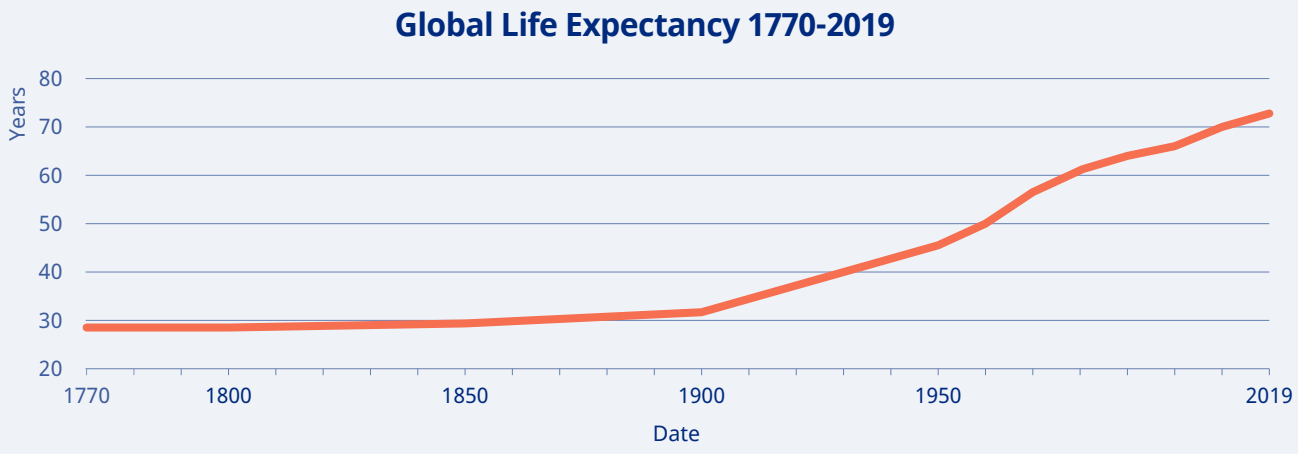
The measurement and analysis of the DBCI and the information it provides is essential if the potential causal pathway of change between intervention and health outcomes is to be identified.[14] Engagement is measured on two levels. Traditional measures associated with the user interaction and user experience such as number of logins, clicks, swipes, time spent interacting with each feature, order of interactions (path taken), real-time feedback/assessment of user experience; and interaction with the individual change behavioral techniques that make up the DBCI targeted at the behavior in question.

Ultimately it is the combination of engagement and appropriate selection of behavioral change techniques[15] that will determine the effectiveness of the DBCI and the attainment of positive health outcomes for the user.

The World is Getting Healthier

The world is far healthier than ever before. The key metric of life expectancy (LE) at birth (Figure 1) is testimony to the astonishing achievements and progress made in global health.

Figure 1: Global Life Expectancy at Birth



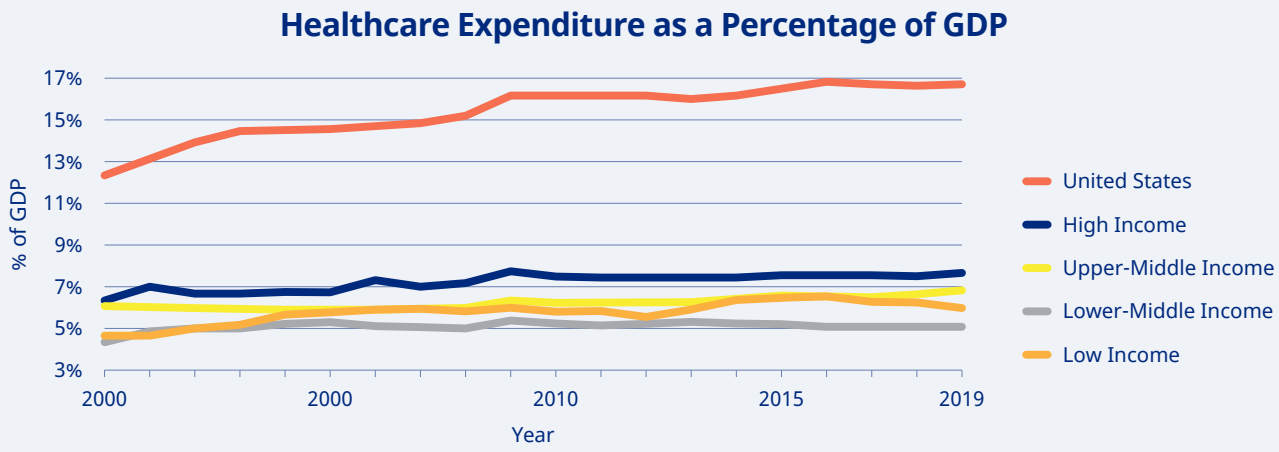
Source: Our World in Data, based on estimates by James C. Riley, Clio Infra, and the United Nations Population Division

While the 20th century experienced a transformation in global health unmatched in history, considerable progress continues to be made during the early years of the 21st century. Between 2000 and 2019, LE at birth increased from 66.8 years in 2000 to 73.3 years in 2019, and healthy life expectancy (HALE) increased from 58.3 years to 63.7 years. While both metrics were rising, LE was improving moderately faster than HALE worldwide, leading to a slightly higher proportion of years lived with disability.[16]

The Price of Progress

The revolution in global health comes at a price. Global healthcare expenditure (Figure 2) continues to rise as a percentage of global gross domestic product (GDP), having more than doubled in real terms over the past two decades, reaching US$ 8.5 trillion in 2019, or 9.8% of global GDP (up from 8.5% in 2000).[17]

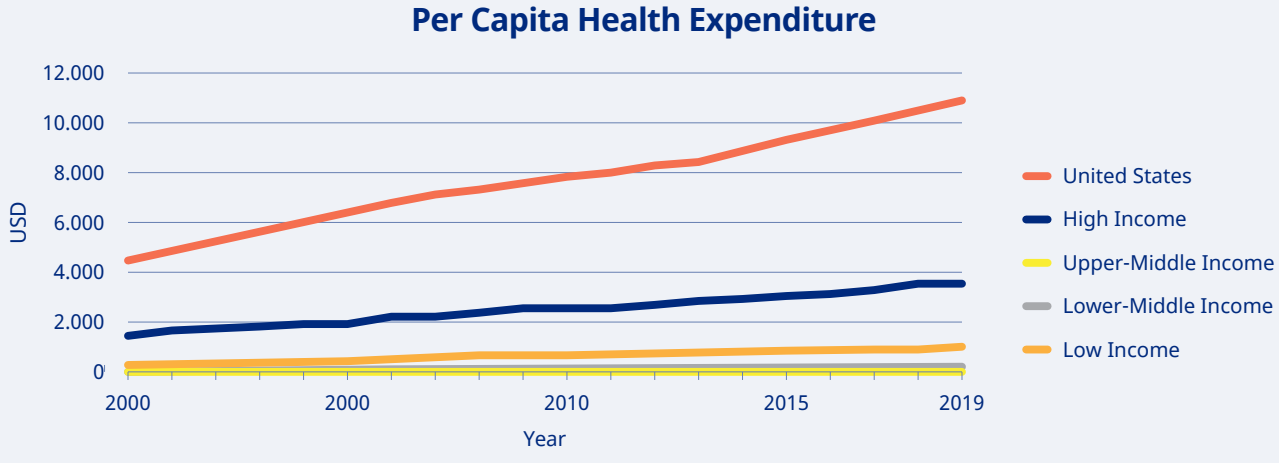
Figure 2: Healthcare Expenditure as a percentage of GDP



Source: Our World in Data, World Health Organization, Global Health Observatory

Expenditure also remains unequally distributed. High income countries account for approximately 80% of global healthcare expenditure, with the United States alone accounting for more than 40%.[18] When expressed at a per capita level (Figure 3), the disparity in global health spending is more immediate. The United States tops the table at USD 10,921, while the Democratic Republic of Congo is only spending USD 41.

Figure 3: Per Capita Health Expenditure



Source: Our World in Data, World Health Organization, Global Health Observatory

Affordable healthcare is a fundamental need for all countries, whatever their level of economic development. Affordability is ultimately a political choice. As healthcare spending outpaces the economic growth in many countries those in charge of public finances will have to confront the sustainability challenge facing the health sector and the trade-offs required between competing public goods.[19]

Key Drivers Impacting Financial Sustainability

Disruptor or accelerant to name a few - there is no shortage of adjectives to describe the impact Covid-19 continues to have on the health sector.

Covid-19 forced the healthcare delivery industry to adapt its practices, exposing the truth that much of healthcare can be delivered in ways that are more convenient, flexible, and low cost for consumers; and there is no turning back.[20]

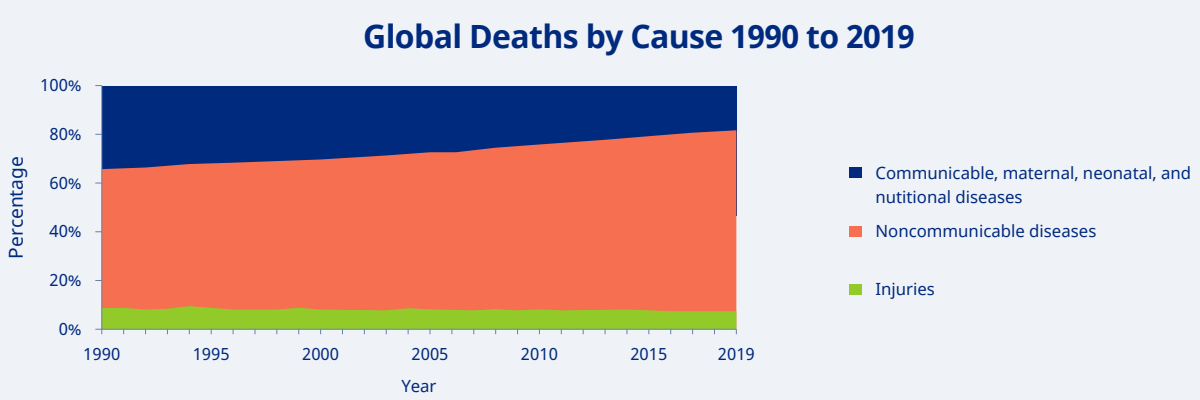
As uncomfortable as it may sound, clinical outcomes while experienced as health and not as money can be translated into financial terms.[21] Call it low cost or affordability. Value for money will be the predominant focus for consumers and payers alike. The table stakes, a willingness to sever long standing relationships in the name of affordability and continued access to healthcare services.

The key drivers impacting financial sustainability at a global level, forces that transcend national borders, are well documented and include:

Non-communicable Disease as the Leading Cause of Illness

NCDs are the leading global cause of death and are responsible for just over 70% of deaths worldwide (Figure 4).[22]

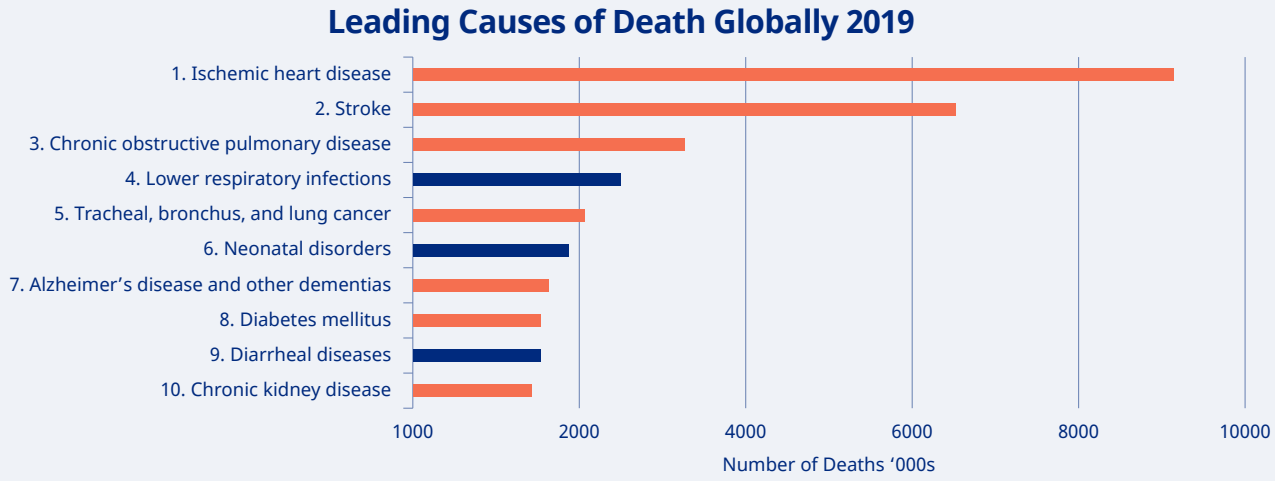
Figure 4: Global Deaths by Cause



Source: Our World in Data, Institute for Health Metrics and Evaluation

At a global level, 7 of the 10 leading causes of deaths in 2019 were noncommunicable diseases (Figure 5). These seven causes accounted for 44% of all deaths or 80% of the top 10. While there is only one communicable disease (lower respiratory infections) in the top 10 causes of death for upper-middle-income countries, lower-middle-income countries have the most disparate top 10 causes of death: five noncommunicable, four communicable, and one injury.[23]

Figure 5: Leading Causes of Death Globally



Source: Institute for Health Metrics and Evaluation

With the adoption in 2015 of the Sustainable Development Goals (SDG) by Member States of the United Nations, and specifically Goal 3: Ensure healthy lives and promote well-being for all at all ages, world leaders brought a much needed focus upon the battle to reduce the prevalence of NCDs, committing by 2030 to:[24]

> **"... reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.**

Least we need reminding, and over more than a decade ago, a macro-economic simulation presented at the World Economic Forum in 2011 showed that over the next two decades, NCDs (chiefly cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes) would lead to a staggering USD 47 trillion cumulative output losses globally, representing 75% of global GDP in 2010.[25]

At a more granular level, a systematic search of the published literature to find the share of major NCDs (cardiovascular, endocrine, respiratory, and mental disorders and neoplasms) in total expenditures on health for a limited sample of 13 countries (Australia, Canada, Czech Republic, Estonia, France, Georgia, Germany, Hungary, India, Republic of Korea, Sri Lanka, Slovenia, and Sweden) and for which complete data sets were available was published during 2011. The study established the NCDs in question accounted for over a third of a country's total health expenditures.[26]

The Paradox of Medical Technology

The relationship between medical technology and healthcare expenditure is complex, paradoxical, and often conflicting.

Health would appear to be the only industry where prices increase upon the introduction of new technology. At least in the United States, where healthcare economists estimate that 40% to 50% of annual cost increases in healthcare expenditure can be traced to new technologies or the intensified use of old ones.[27]

While technological improvements may lead to lower prices and improved clinical outcomes the paradox lies in the potential increase in demand for the new service or product. What was once unaffordable is now affordable. Medical uses of a new therapy are increased through addressing an unmet demand, and this expansion in use (treatment expansion) leads to a net rise in expenditure.[28]

Hopes are that digital health may prove to be different.

Digital technologies often include innovative software solutions and algorithms that could be substantially cheaper than non-connected devices or drugs. These technologies also tend to focus on solutions to the notoriously inefficient delivery systems of health care globally, as opposed to the development of new treatments. Given that the alternative to digital technologies would potentially be a more labor-intensive model of care, one might expect their adoption to replace costly healthcare professional time or hospital services.[29]

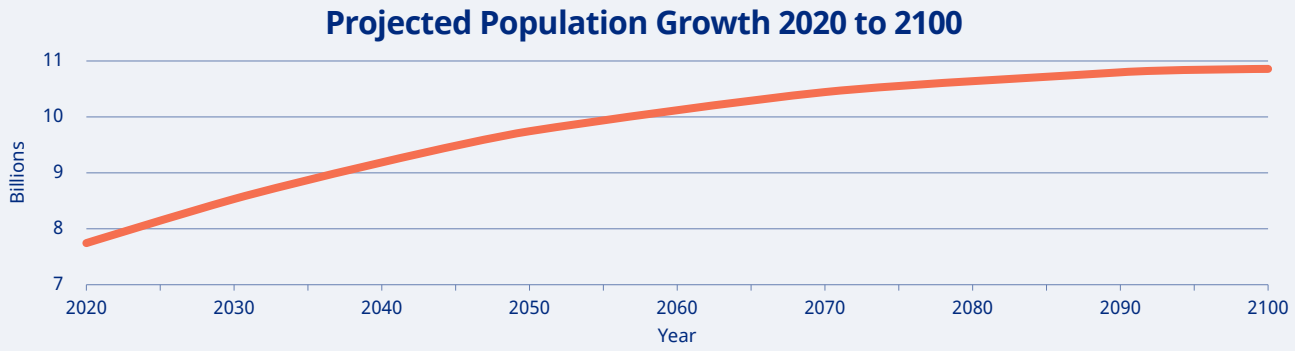
Changing Demographics: Expanding and Aging Populations

There would appear to be some disagreement within the research community on the exact timing of when the global population will peak and at what level.

Estimates emanating from the United Nations project that the global population could grow to around 8.5 billion in 2030, 9.7 billion in 2050, and continue to rise beyond 10.9 billion in 2100 (Figure 6).[30] Researchers at the University of Washington hold a different view, predicting a peak of between 6.3 billion and 8.8 billion by 2100.

What is certain is that for the foreseeable future the population of the world will continue to grow, with changing demographics towards an elderly population placing an increasing demand upon healthcare services wherever they are located.[31]

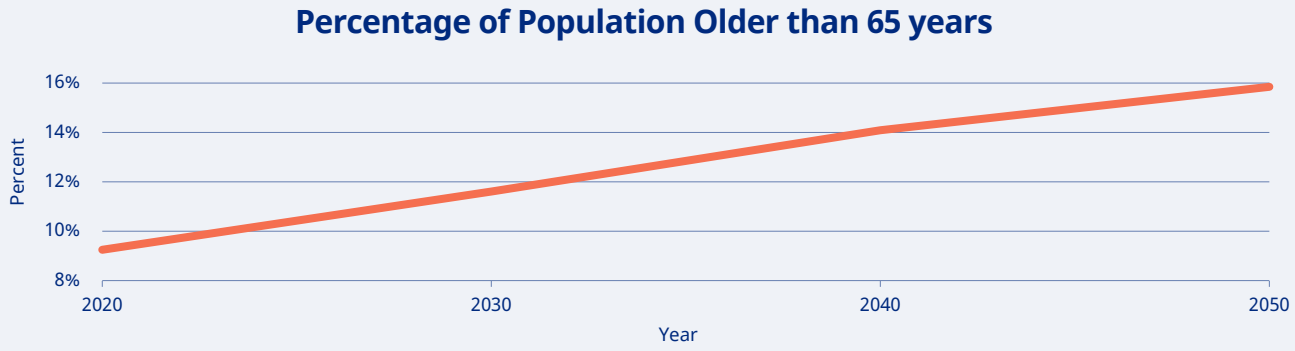
Figure 6: Projected Population Growth



Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). Probabilistic Population Projections Rev. 1 based on the World Population Prospects 2019

There seems to be less controversy surrounding the dynamics of an aging global population. By 2050, the number of people aged 65 or older is expected to nearly triple to approximately 1.5 billion, representing 16% of the world's population, as a result of declines in fertility and improvements in longevity (Figure 7). The majority of these people and growth will occur in less developed countries, which will see the number of older people increase by more than 250% from 2010 to 2050.

Figure 7: Global Population Older than 65



Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). Probabilistic Population Projections Rev. 1 based on the World Population Prospects 2019

Increased Customer and Patient Expectations

Consumers are becoming more demanding as their experiences in other industries inform their expectations of convenience and service from healthcare providers.[32] As the Digital Native, Millennials (born 1982 – 1997) and Generation Z (born 1997 or after), becomes the primary demographic requiring healthcare, both providers and payers will have to embrace digitization if they are to remain competitive.

Nor is this phenomena confined to Millennials and Generation Z. A recent study in the United States indicated the largest increases in the use of virtual health care from 2018 to March 2020 were among Baby Boomers (born 1946 – 1964) and Generation X (born 1965 – 1981).[33]

A greater sense of agency in consumers is also evident. With increasing access to and control over their personal health data, consumers are more than ever informed and empowered. In the same study noted above, 51% of consumers said they were very or extremely likely to tell their doctors, when they disagree with them.[34] From tracking their health, questioning the decisions of their physician, or querying information on the internet on costs and outcome, there is no closing the stable door.

Skills Shortage

A shortfall of 18 million health workers by 2030 is projected, mostly in low- and lower-middle income countries.[35] With more than 50% of the current shortage in health workers attributable to nurses and midwives, the world will need an additional 9 million nurses and midwives, if it is to reach Goal 3: Ensure healthy lives and promote well-being for all at all ages, by the year 2030.[36]

DHEI Survey

It is against this backdrop that we launched our first exploratory survey. Our survey explored five themes:

Value of DHE Platforms

While over 80% of respondents hold the view that DHE platforms add value for industry players transitioning into Insurance as a Service (IaaS) models, only 49% of respondents actually offered DHE platform to individual and group customers.

What is encouraging is the pipeline with 18% of respondents indicating they intend launching a DHE platform within the next 6 months or have plans to do so in the next 6 to 12 months.

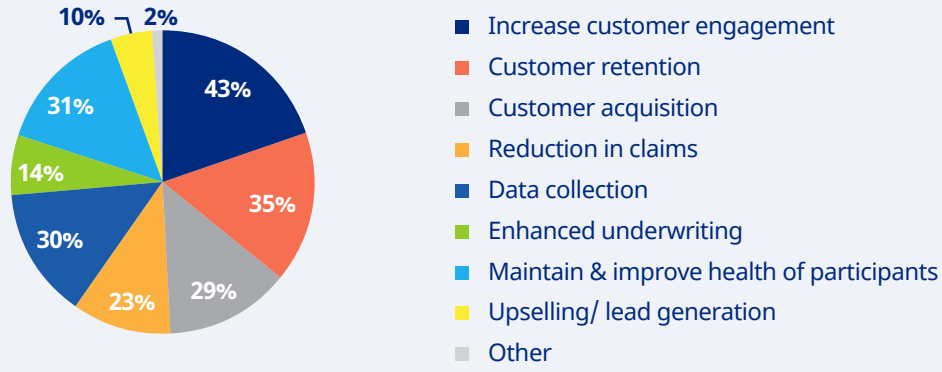
Does your company offer digital health engagement (DHE) platforms to individual and group customers today?

Source: DHEI Digital Health Engagement Survey, February 2022

With over 60% of respondents, perhaps mirroring those who have already demonstrated their conviction and deployed a DHE platform, are of the opinion that providing DHE alongside traditional insurance services will reinforce their existing customer relationships. The same percentage, recognizing the rise of lifestyle related diseases, supported the idea that DHE platforms could motivate insurance operators to realize the importance of preventative health care, as the shift from treatment to prevention takes hold.

In an ever increasingly competitive market, it is clear that revenue and market share reign supreme with customer upselling, lead generation, engagement, retention, and acquisition driving the rollout of DHE platforms. Although different sides of the same coin, the enhancement of underwriting and reduction in claims ran a distant secondt.

What do see as the single most important business driver of a DHE platforms?

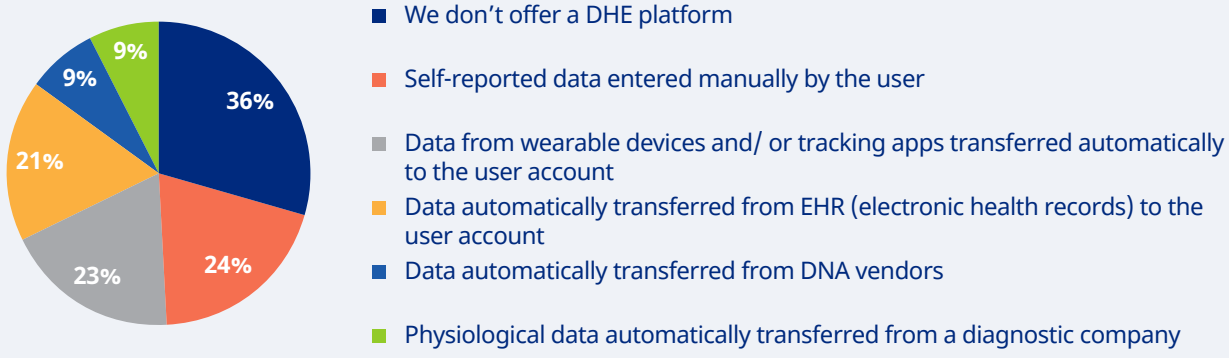


Source: DHEI Digital Health Engagement Survey, February 2022

The Paradox of Medical Technology

The API (Application Programming Interface) economy is clearly upon us with DHE platforms connecting to the myriad of service providers in the health ecosystem and updating user data automatically. Self-reported data remains a significant component of data collection with 24% of respondents indicating that self-reported data is still part of their data collection activities.

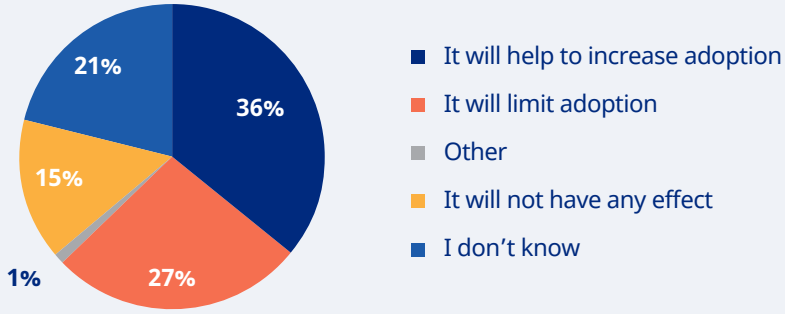
What kind of data input options does your DHE platform offer?



Source: DHEI Digital Health Engagement Survey, February 2022

In the regulatory sphere the jury would appear to be divided on whether GDPR (General Data Protection Regulations) in the EU or HIPAA (Health Insurance Portability and Accountability Act) in the USA will have a positive (21%) or negative (27%) impact upon the universal consumer adoption of DHE platforms.

Do you believe that the GDPR in the EU or HIPAA in the USA will impact universal consumer adoption of DHE platforms?



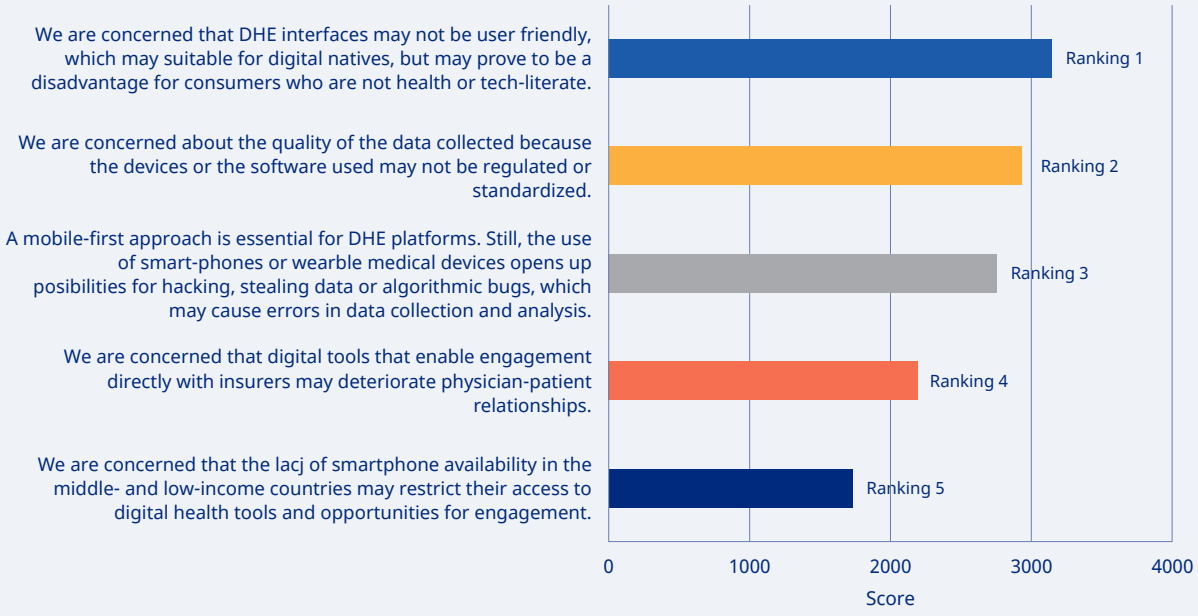
Source: DHEI Digital Health Engagement Survey, February 2022

Respondents nevertheless expressed confidence in the laws and regulations introduced to improve data security in their region, scoring an average of 6 out of 10 (not confident to very confident). Respondents acknowledged that data privacy concerns were impacting their organizations decisions about adopting DHE platforms, scoring and average 5.6 out of 10 (not at all – very much so).

Ethical Considerations

Science and technology invariably lead the way, introducing rules of their own design, while the regulatory environment plays catch-up. To obtain a sense of the multi-faceted ethical dilemmas that insurers will encounter in the years ahead the respondents were requested to rank the statements below from most severe to least severe.

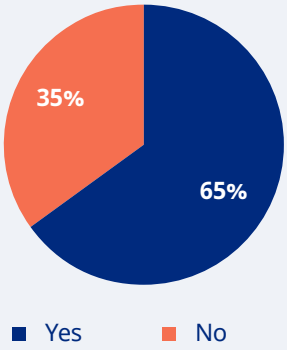
Which factors do you think are the most essential ethical concerns in the widescale adoption of DHE by insurers?



Source: DHEI Digital Health Engagement Survey, February 2022

While greater access to data opens up the specter of the personalization of risk, the value (not valuable – very valuable) of health scoring was accorded a score of 61 (out of a possible 100) in so far, as it was seen as contributing to the customer segmentation process. Building upon the opportunity for greater customization that access to data affords, strong support is evident for rewarding consumers for achieving better health, with just under 80% of respondents in favor of this approach.

A clear message highlighting the ambiguity in the uninhabited land that falls between ethics, innovation, and the regulatory environment, is to be found in the concern expressed for the potential for discriminatory human biases making their way into our Artificial Intelligence systems. 65% of respondents indicated this would be of concern when evaluating a potential DHE platform.



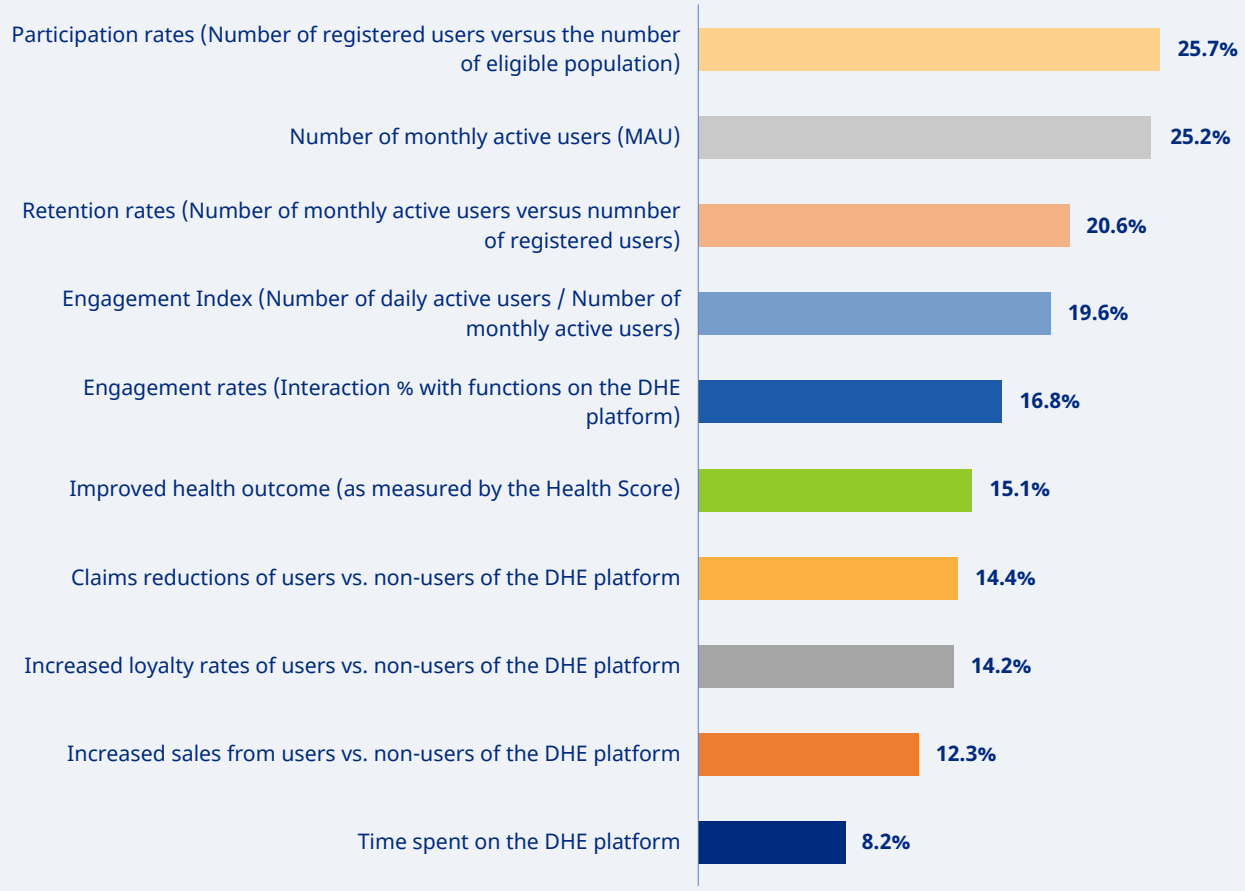
Is the risk of inherent bias in data analysis and the potential for discriminatory results towards specific populations a concern for you when looking into a DHE platform to adopt?

Source: DHEI Digital Health Engagement Survey, February 2022

Measuring Engagement

Traditional measures of website and app engagement, such as time spent on the site or app, number of monthly active users, number of registered users versus number of eligible population and the like would appear to be the predominant metrics applied when evaluating user engagement. Surprisingly, improved health outcomes, perhaps the main reason why consumers and patients enroll in a health and wellness program scored relatively low.

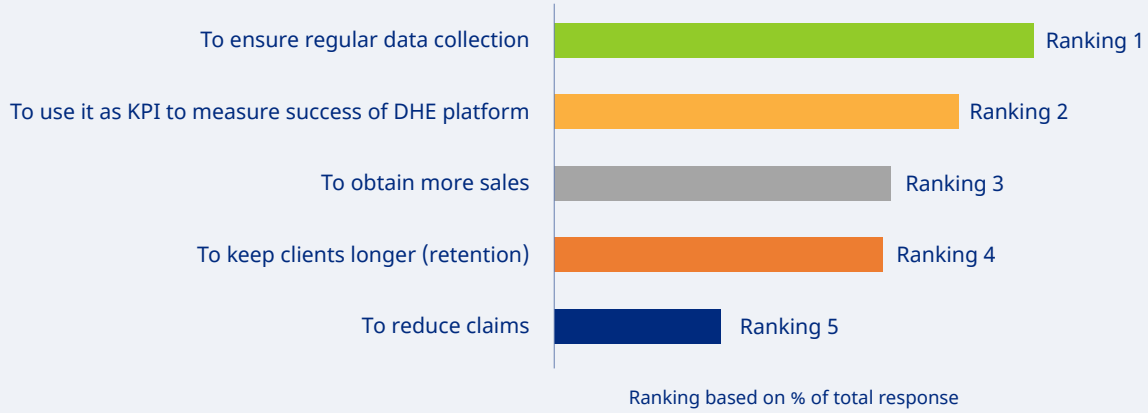
What metrics do you use to measure engagement on your DHE platforms?



Source: DHEI Digital Health Engagement Survey, February 2022

Similarly, when asked why engagement is measured, ensuring regular data collection ranked highest, followed closely by evaluating traditional metrics of customer acquisition and retention. Results are either compared against in-house past performance, or if available, benchmarks obtained externally. Slightly lower in the rankings is the comparison of results without a DHE platform.

Why do you measure engagement?



Source: DHEI Digital Health Engagement Survey, February 2022

Responses to an open ended question on how engagement is defined and quantified were many and varied, ranging from:

> **We don't define or quantify engagement... I don't know... Not really sure...**

> **Daily interaction with the company... Number of monthly active users and retention rates...**

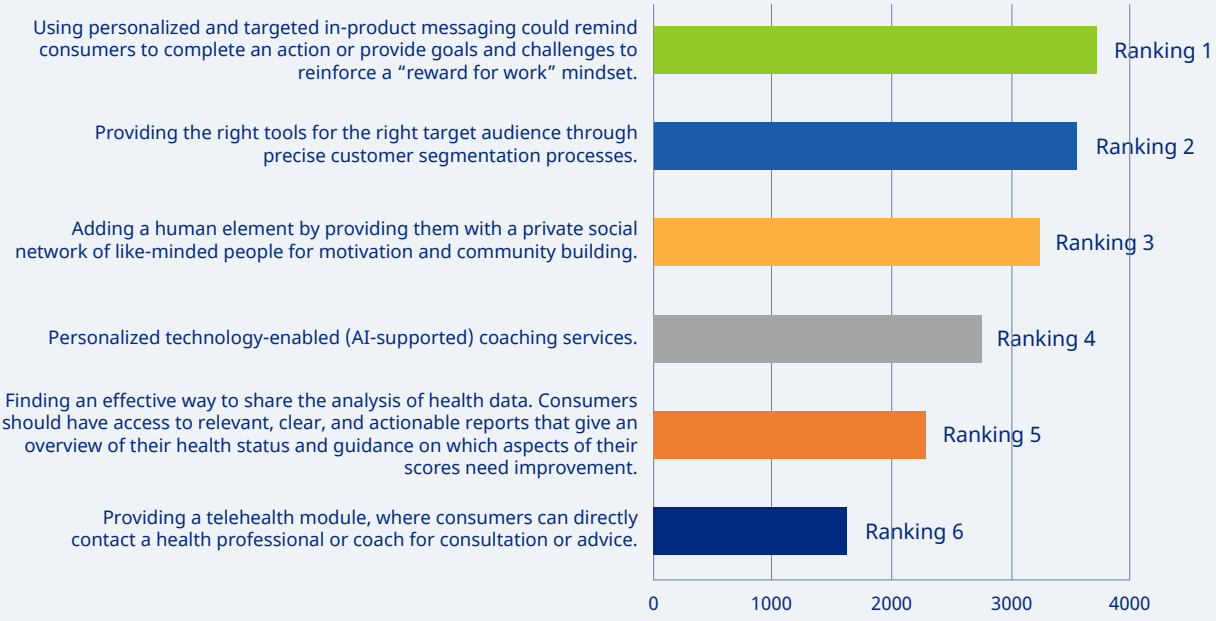
> **We define it by the health of the customers, as they indulge with the company...**

The range and nature of answers would appear to indicate that much work needs to be done in developing a common understanding across the health industry on how best to define and measure engagement in the context of DHE platforms.

Features: Form Over Function?

DHE platform features incorporating personalization such as in-app messaging, matching behavioral change technique tools to users more precisely,[37] and adding a human touch either through group support or in person coaching all ranked highly in importance.

Which features do you think are essential to encourage consumers to engage positively with DHE platforms?

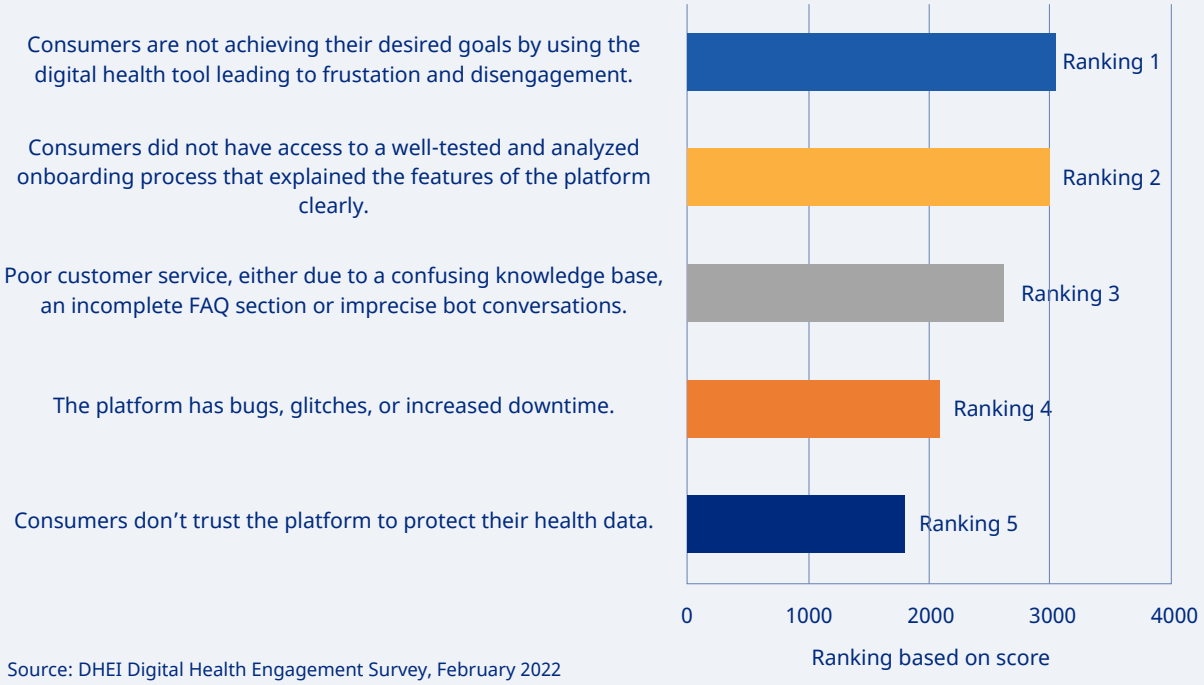


Source: DHEI Digital Health Engagement Survey, February 2022

When asked to suggest additional factors that could lead to positive consumer engagement with DHE platforms, suggestions clustered around incentivizing interactions through rewards and recognition, in-app and online support, and external links to experts in the medical field and coaches. The creation of trust and its enhancement through greater product education and clarity in the data analysis presented to users, was also a feature of the many suggestions.

Failure to achieve one's personal goals as well as a poor onboarding process ranked highest amongst the determinants of negative consumer engagement.

Which factors do you think would contribute most toward negative consumer engagement with DHE platforms?



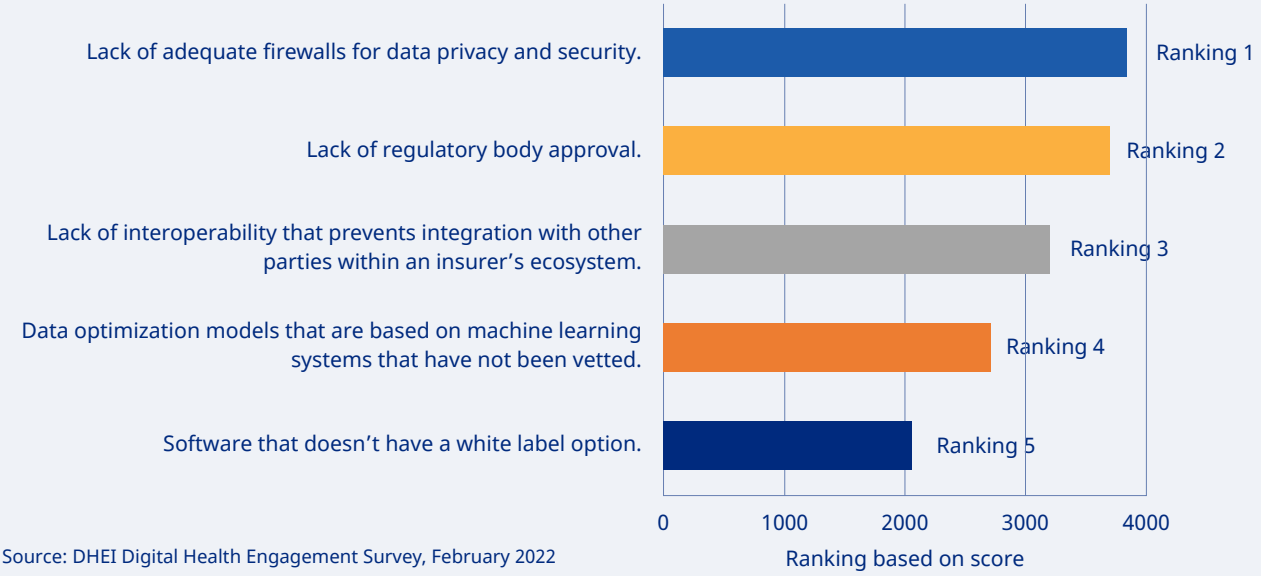
Source: DHEI Digital Health Engagement Survey, February 2022

Suggestions pointing to factors that would contribute toward negative consumer engagement with DHE platforms were grouped around trust, the collection and improper handling of personal data, poor communication, and user support, as well as a poor user experience whether through inadequate product knowledge or data analysis presented in a manner that is not easily understood.

Given the sensitivities surrounding data privacy and security, as well as the recognition that regulatory authorities responsible for oversight in this domain can and do intervene, the top ranking as potential deal breakers of data privacy and security, as well as regulatory approval, is not unexpected. Similarly, ethical constraints linked to artificial intelligence, machine learning and the risk posed by inherent bias is also of concern.

In the absence of interoperability DHE Platform operators will be shut out of the API economy and the emerging insure and healthcare ecosystems.

There could be a combination of features missing in a DHE platform. Which ones are potential deal-breakers that would stop you from going ahead with the integration of the software into your services?



Source: DHEI Digital Health Engagement Survey, February 2022

Conclusion

There is a growing body of evidence that supports the important and significant contribution Digital Health Engagement Platforms are making towards securing the financial sustainability of our global health system and improving health outcomes. The risks posed to society by the ever increasing prevalence of lifestyle diseases and the financial burden associated with their ascendancy are existential in nature. Demanding value for money is part of the solution, as is shifting the focus toward prevention and well-being by merging what we have learnt from the extensive research in the field of behavioral science with the power of mobile digital technology - the Digital Health Engagement Platform.

Our survey of over 1,200 insurance executives and professionals, across North and South America, Europe, Middle East, Asia Pacific and Africa, indicates that the majority of stakeholders in the health industry recognize the added value Digital Health Engagement Platforms bring to industry players transitioning into Insurance as a Service model. Recognition, however, has yet to translate into action for some, with a third of respondents indicating they had still not planned to implement a Digital Health Engagement Platform.

While AI (Artificial Intelligence) and its potential for inherent bias was on the list of concerns when evaluating a potential Digital Health Engagement Platform, inadequate firewalls for data privacy and security along with lack of regulatory approval were possible deal breakers stopping integration of the Digital Health Engagement Platform with their own systems.

We would be remiss if we didn't acknowledge how Covid-19 has accelerated the pace of disruption across all sectors of the economy, and not just the health sector. But with change comes opportunity. Many commentators observe that the big winner in this sea of change will be the digital consumer.

Here at the Digital Health Engagement Institute, we see it differently.

Success in this domain is a function of a shared responsibility amongst all stakeholders: Payers, Providers, consumers, patients, and the regulatory authorities.

Collaboration is in all of our interests, and we all stand to benefit both from a quality of life point of view and from a cost perspective to society.

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