future health index

SOUTH AFRICA
LOCAL MARKET SPECIAL REPORT #2
DATA COLLECTION & ANALYTICS:
Local Perspectives

2018

THE FUTURE HEALTH INDEX IS COMMISSIONED BY PHILIPS

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I. Value Measure

Value Measure

In line with many developing markets (Brazil, India, China), South Africa's Value Measure is below the 16-country average.

- When it comes to value, South Africa falls below the 16-country average overall and across all factors that comprise the Value Measure. Access, specifically, has the largest discrepancy, falling over 21 points below the average. The gaps between South Africa's score and the 16-country average are less pronounced in the areas of satisfaction and efficiency, though they are significant gaps nonetheless.

VALUE MEASURE 2018

	South Africa	16-Country Average
Value Measure:	**26.61**	**43.48**
Access:	29.21	50.91
Satisfaction:	39.53	52.85
Efficiency (spend on healthcare/outcomes):	11.09	26.69

II. Data

Electronic Health Records (EHRs)

Is complete interoperability achievable?

While the infrastructure in South Africa is not yet well set up for interoperability, the general population and healthcare professionals (HCPs) are aligned on its importance.

- South Africa does not have a universal EHR,[1,2] and the data collection score for EHRs is lower than the average of 16 countries surveyed within FHI (6.46 vs 23.19).[3] The market size for EHRs in hospitals and ambulatory use are also lower than the 16-country average ($267.57 per hospital bed compared to $2,436.85 average for hospital use[4] and $0.50 per capita compared to $4.67 per capita for ambulatory use).[5]

[1] The Commonwealth Fund. (2010-2015)
[2] WHO. (2010-2015)
[3] *Future Health Index.* 2017
[4] WHO. (2009-2015)
[5] World Bank. (2016)

- Three-quarters of South Africans (75%) said they believe integration is important.[6] Most HCPs (83%) also believe integration is important.[7] However, only 27% of the general population and 15% of HCPs believe that the health system in South Africa is currently integrated.[8]

Can they be part of the broader e-citizenship agenda?

South Africa needs both infrastructure and educational improvements to support EHR implementation.

- As previously mentioned, South Africa does not have a universal EHR[9,10] nor a national policy for data protection and data sharing.[11] Not only does South Africa currently lack the foundational legislative elements to support widespread EHR adoption, but it also lacks certain technological infrastructures that could aid interoperability. For example, its internet penetration rate is 54%, which is lower than the 16-country average for countries within the FHI (74%), and the number of secure servers per capita is 0.12, compared to a 0.86 average for countries surveyed within FHI.[12]
- Although most South Africans feel some ownership over their medical records (68%), one-in-three (32%) still feel as if they have no ownership of their medical records.[13] Additionally, of South Africans who have used connected care technology, only 77% said they know when to share the data with a healthcare provider, indicating that there is a need to ensure that the data that is shared with healthcare professionals is meaningful and accurate. This is particularly relevant considering that 16% of people who have used connected care technology reported that they do not understand how to properly use the technology.[14] This highlights a need for education around data for the population, in order to better data use in healthcare and within the broader e-citizenship agenda.

The importance of HCP adoption

Among healthcare professionals in South Africa, there is an enthusiasm for interoperability in healthcare, but there remains a portion of professionals in the industry that need to be convinced of its benefits.

- While a quarter (22%) of South African HCPs noted they believe that the responsibility for getting medical records from one healthcare facility to another currently lies with patients, only one-in-ten (10%) believe that it should lie with patients.[15] Additionally, three-quarters (74%) said they believe that responsibility should lie with both patients and HCPs and facilities.[16] This indicates that while a significant portion of HCPs are willing to take on at least some part of the burden of acquiring and transporting medical records, there is still a lingering portion of the population that is resisting completely, and the majority are not willing to take on sole responsibility (only 14% said that responsibility should lie solely with healthcare professionals

[6] *Future Health Index.* 2017
[7] Ibid.
[8] Ibid.
[9]The Commonwealth Fund. (2010-2015)
[10] WHO. (2010-2015)
[11] WHO. (2016)
[12] World Bank. (2016)
[13] *Future Health Index.* 2017
[14] Ibid.
[15] Ibid.
[16] Ibid.

and facilities).[17] This further indicates that there may be some pain points with the transport of medical records that are influencing healthcare providers' opinions on the process.

- While data shows that there are HCPs resisting responsibility for interoperability, healthcare providers in South Africa do see benefits to EHRs and interoperability in the health system. Overall, healthcare providers in South Africa most frequently cited accessible, secure information sharing platforms between HCPs as the healthcare technology that will have the most positive impact on citizens trying to take care of their health (31%).[18]
    - There does, however, seem to be a slight discrepancy among how healthcare providers view integration depending on the number of years they've spent in the field. About 9 out of 10 healthcare providers surveyed in South Africa who have spent less than 19 years in the field believe it is important that the healthcare system be integrated (91% of those who have been in the field less than 11 years view it as important, and 90% of those who have been in the field between 11 and 19 years view it as important). However, among those who have spent 20 or more years in the field, the number of those who believe that it is important that the health system be integrated drops to 76%.[19] This indicates that while most HCPs in South Africa believe in the importance of health system integration (83% overall),[20] there may be variation depending on years of experience, which may be related to age.

How can the payers drive adoption?

Insurers are integrating EHRs into their offerings, but they also have concerns about regulations, attitudes and systemic problems within healthcare in the future.

- Across insurers surveyed within the FHI in the UK, US, France, the Netherlands and China, nearly half (46%) said their organization has already integrated access to EHRs into their offerings/pricing.[21]
- Another 46% said they are in the process of integrating this into their offerings/pricing and 7% said they are not integrated yet, but intend to in the future.[22] This implies that insurers value the idea of a universal EHR and, as such, can offer cost incentives to patients and healthcare facilities to use these technologies.
- Insurers in these countries pointed to health system bureaucracy (29%), the attitude of healthcare professionals towards adopting technologies (28%) and government health-related regulation/policy (23%) as some of the factors they think will have the biggest impact on the healthcare industry in the future.[23] These factors could also impact EHRs and interoperability in health systems.

[17] Ibid.
[18] Ibid.
[19] Ibid.
[20] *Future Health Index.* 2017
[21] Ibid.
[22] Ibid.
[23] Ibid.

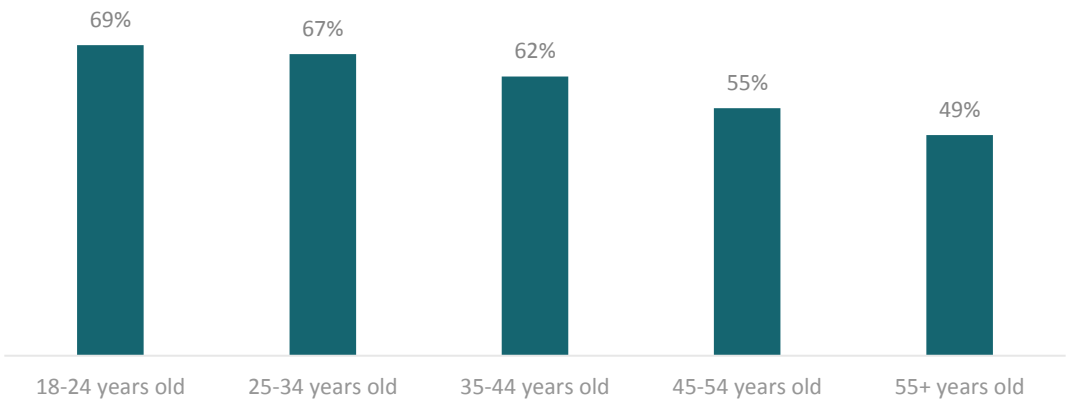
Data Analytics: AI

What can be done to improve public trust in data analytics?

Education around data analytics and how data can improve healthcare could help improve the lack of trust surrounding these technologies.

- A report from PwC found that many people surveyed in Nigeria, Turkey, South Africa, Saudi Arabia, Qatar, UAE, the Netherlands, Belgium, Norway, Sweden, Germany and the UK, are willing to engage with AI and robotics for their healthcare needs, indicating an openness to using AI technologies for information sharing.[24] This willingness to use AI and robotics in healthcare increases with each younger generation, perhaps indicating meaning that older people who have an increased likelihood of suffering from chronic diseases are more cautious around AI.[25]

Percentage worldwide willing to engage with artificial intelligence (AI) and robotics for healthcare needs in select countries as of 2016, by age
(PwC - What Doctor? Why AI and Robotics Will Define New Health, 2017)



- Individuals who are most comfortable with consumer technology today are the most likely to trust and embrace next-generation AI routines. According to the FHI, among all those surveyed across the 16 countries, those who see the system as more integrated are more likely to trust the system, with 79% of those who see the system as very or completely integrated trusting it, compared to just 47% of those who think the system is only somewhat or not at all integrated.[26] This indicates that integration and trust in data may be related, and that in working to improve one organization's integration may improve trust as well.
- In South Africa specifically, the general population would least want their healthcare data made public if their account was hacked (53%), chosen over information from email accounts or

[24] PwC. (2017, June 1). *What Doctor? Why AI and Robotics Will Define New Health*. Retrieved from www.statista.com/statistics/818806/willing-people-to-enage-ai-and-robotics-for-healthcare-needs-worldwide-by-age/
[25] Ibid.
[26] *Future Health Index.* 2017.

social media accounts.[27] The general population also trusts the healthcare industry (48%) and banks (44%) most with their personal data. [28]

- Only 37% of South Africans claim to be knowledgeable about connected care technologies, and only 66% of healthcare professionals claim to be knowledgeable.[29] While there is a lack of understanding among both healthcare professionals and the general population in South Africa that may be influencing trust levels, there is also a large gap in understanding between these two groups. Ensuring that the general population is on par with healthcare providers in their understanding of and use of connected care technologies could help improve overall trust in the data these technologies provide and analyze.
    - Additionally, even out of those who have used connected care technologies, there remains a small percentage of people who do not completely understand the technology. Within the general population in South Africa who reported using connected care technology, 84% understand how to properly use the technology, 80% understand the easiest way to share data with a healthcare professional, 80% understand how to interpret results from the technology, and 77% understand when to share data with a healthcare professional.[30] This leaves a smaller but still significant amount of connected care users who need education around the technologies, as well as those that have never used them. This indicates that education around data's potential to improve healthcare and how it can be used is critical for the general population.
    - This lack of understanding also could be related to low use rates for connected care, as only 68% of South African healthcare providers report that their practice uses connected care technologies in some way.[31]

Transforming health organizations into data organizations

In order for organizations to more fully implement data use, better training and investments in the right healthcare technologies are necessary. Additionally, in order for health organizations to be data organizations, increased access to data is crucial.

- According to a study by Infosys,[32] which surveyed C-level executives and IT decision makers (ITDMs) at companies in Australia, China, France, Germany, India, the UK and the US, internal stakeholders have similar concerns to the public when it comes to the implementation of AI.
    - Just under half (45%) of all survey respondents reported having **IT privacy concerns** regarding AI at their organizations.[33] According to C-level executives surveyed, security concerns are high among leadership teams. Almost two-thirds (64% of C-level executives) responded that privacy and security issues are holding their organizations' leadership back from investing in AI.[34]

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[27] Ibid.
[28] Ibid.
[29] Ibid.
[30] Ibid.
[31] *Future Health Index.* 2017.
[32] Infosys. (2018). *Leadership in the Age of AI.* Retrieved from: www.infosys.com/age-of-ai/Documents/age-of-ai-infosys-research-report.pdf
[33] Ibid.
[34] Ibid.

    - **Data integrity** was the second highest concern, with 37% of total respondents reporting issues with AI initiatives.[35] About half (49%) of respondents in this study reported that AI technologies are not being used because they lack the data infrastructure to support it. About three-quarters of ITDMs surveyed said that they are investing in data management to improve this situation (77%).[36]
    - Concerns regarding **employee training** were also high, with 36% of total respondents claiming that the need for further training was an issue in implementing AI in their companies.[37] Three-quarters (75%) of ITDMs surveyed reported that their respective executive teams could benefit from training on the capabilities of AI technologies.[38]
- While many organizations have not completely deployed AI, and workforces may need additional training on AI, steps are being taken. According to the same study by Infosys, nearly nine-in-ten (86%) of those surveyed across Australia, China, France, Germany, India, the UK and the US said that they are in the middle or late stages of AI deployment.[39] However, over half surveyed by Infosys within the healthcare and life sciences industry reported that finding qualified employees to lead AI technologies integration is difficult (61%), indicating a possible barrier to implementation.[40]
    - However, over three-quarters (77%) of ITDMs surveyed were confident that employees within their organization could be trained for the jobs AI implementation will create, and over half (53%) of all survey respondents reported that their organization has increased training for positions that are most affected by new AI initiatives.[41]
- In South Africa, the market size for AI in preliminary diagnosis is much smaller than the 16-country average of countries within the FHI ($0.006 USD per capita compared to $0.03 USD per capita), as is the market size for AI in therapy planning ($0.01 USD per capita compared to $0.06 USD per capita).[42] The data collection score for EHRs and wearables is 10.96 out of 100, which is small compared to the 28.57 average for countries within FHI.[43] This shows that South Africa has steps to make in the widespread use of AI, EHR and wearables before data can drive healthcare organizations.

AI's role in liberating HCPs

Artificial intelligence (AI) could not only improve health outcomes and accuracy across healthcare, but it provides an opportunity to free up physicians and healthcare providers from certain tasks, allowing them more time to provide quality care to more patients.

[35] Ibid.
[36] Ibid.
[37] Ibid.
[38] Ibid.
[39] Ibid.
[40] Infosys. (2018). *Leadership in the Age of AI*. Retrieved from www.infosys.com/age-of-ai/Documents/age-of-ai-infosys-research-report.pdf.
[41] Ibid.
[42] World Bank. (2016)
[43] *Future Health Index.* 2017

- According to Becker's Healthcare[44] and Forbes,[45] AI applications enhance the capacity to process and store large amounts of data and implicate that information into meaningful tools and functions. AI is capable of searching and analyzing patient data or accomplishing administrative duties faster than humans, therefore, allowing AI to function in these ways will offer more free time to physicians to perform other meaningful aspects of care.
    - Infosys' survey found that 90% of C-level executives reported measurable benefits for their organization from deploying AI technologies.[46]
    - Additionally, just under half (45%) of total respondents in the Infosys survey said the AI deployments in their organization are greatly going beyond both the accuracy and productivity of comparable employee (i.e., human) activity.[47]
- The recent reporting in Forbes also suggests that HCPs need to observe tangible cases where AI has improved outcomes and these instances must be continuously communicated throughout the industry to ensure awareness.[48]
    - For example, Forbes cited a pair of independent studies that analyzed telephone interviews and medical claim records for 2,406 insured women which found that 50% to 63% of US women who get regular mammograms will receive at least one "false-positive" over a ten-year period.[49] This means that they will receive a test result that incorrectly indicates cancer, requiring additional testing and potentially unnecessary procedures before the result is identified as false.
    - It is common for radiologists to misinterpret mammogram results, as there is an accuracy gap between the human and digital eye. AI visual recognition software is estimated to be 5%-10% more accurate than the average physician, thus using this tool could decrease the false-positive rate.[50] This is the kind of statistic that, if presented to physicians, could increase their affinity for using AI technologies by showing how it can help them implement the best patient care possible.
- It is important to remember, however, that while AI can free up healthcare professionals, healthcare professionals do not want to be replaced by AI. Among South African healthcare professionals surveyed for the FHI, only 3% felt that robot healthcare professionals are the AI tool that would have the most impact on improving healthcare today, if available, and only 6% felt that remote appointments using hologram doctors in patients' homes would have the

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[44] Monteiro, Mike. (2018, February 9). "How AI and doctors can improve healthcare – Together." Retrieved from https://www.beckershospitalreview.com/healthcare-information-technology/how-ai-and-doctors-can-improve-healthcare-together.html

[45] Pearl, M.D. Robert. (2018, March 13). "Artificial Intelligence in Healthcare: Separating Reality from Hype." Retrieved from https://www.forbes.com/sites/robertpearl/2018/03/13/artificial-intelligence-in-healthcare/#696e95991d75.

[46] Infosys. (2018). *Leadership in the Age of AI*. Retrieved from www.infosys.com/age-of-ai/Documents/age-of-ai-infosys-research-report.pdf

[47] Ibid.

[48] Pearl, M.D. Robert. (2018, March 13). "Artificial Intelligence in Healthcare: Separating Reality from Hype." Retrieved from https://www.forbes.com/sites/robertpearl/2018/03/13/artificial-intelligence-in-healthcare/#696e95991d75.

[49] DeFrank, Jessica et al. "Influence of false-positive mammography results on subsequent screening: do physician recommended buffer negative effects?" National Center for Biotechnology Information. (March 13, 2018). *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5835966.*

[50] Pearl, M.D. Robert. (2018, March 13). "Artificial Intelligence in Healthcare: Separating Reality from Hype." Retrieved from https://www.forbes.com/sites/robertpearl/2018/03/13/artificial-intelligence-in-healthcare/#696e95991d75.

most impact.[51] AI health tracker wearables and apps on smartphones that can automatically track health indicators and activities and make suggestions was chosen most frequently (36%), indicating that healthcare providers in South Africa are confident in technology's and data's ability to help patients and improve their caregiving methods in other ways.[52]

Wearables

Understanding their place in a health system

While both healthcare providers and the general population are open to using wearables, they are not currently commonplace within the healthcare system.

- In South Africa, there are 0.02 fitness wearable users per capita (half of the 16-country average of countries within FHI, which is 0.04 per capita) and the market size for wearable medical devices is $0.62 USD per capita (less than the 16-country average of $6.33 per capita).[53] The country's data collection score for wearables is 15.47, which is also less than the 16-country average of 33.96.[54] This indicates that fewer people are using wearables in South Africa than in the broader population of the FHI, and that there is room for growth in these markets.
- Most HCPs in South Africa noted they believe that connected care technologies are used at least sometimes when patients are both being treated for a medical condition (66%) and being diagnosed for a medical condition (66%).[55] South Africa HCPs least frequently believe that connected care technology is being used when patients are healthy and have no medical conditions (35%).[56] This data supports the fact that there is room for growth in the market and that South Africa could benefit from increased use of connected care technologies in healthcare.
- Nearly half of the population (49%) in South Africa surveyed for the FHI reported using connected care technology to monitor a health indicator, with weight being the most frequently monitored health indicator (28%), followed by blood pressure (23%).[57] Half of the population reported that they would be more likely to use connected care technology if a healthcare professional recommended they use it (50%) or if the government subsidized/paid for the technology (49%).[58] This indicates that the population could be ready for widespread adoption with encouragement from the government or the healthcare industry.
- However, only 20% of healthcare professionals in South Africa felt connected care technology would make healthcare less expensive in the long-run, and only 21% said they believe it would make healthcare less expensive for the patient.[59] This indicates that they may not be fully confident in the technologies, and educating healthcare professionals about the financial incentives of connected care technologies could help them encourage patients and their facilities to implement use of more technologies.
- Out of insurers surveyed for the FHI in the US, UK, France, Netherlands and China, well over half (57%) are already taking use of connected care technologies to track health indicators into

[51] *Future Health Index.* (2017)
[52] Ibid.
[53] World Bank. (2017)
[54] *Future Health Index.* 2017
[55] Ibid.
[56] *Future Health Index.* 2017
[57] Ibid.
[58] Ibid.
[59] Ibid.

account when offering reduced rates to clients.[60] This indicates that insurers may also be in a position to encourage connected care technology use.

III. Content Themes

Chapter overviews

1. EHR interoperability: From aspiration to reality

The EHR is seen as a fundamental building block of a more technology-driven integrated approach to healthcare. But there's a lack of integration in the EHR landscape, with interoperability challenges delaying progress. Countries with a 'universal' EHR (Australia, China, France, Germany, Italy, Russia, Singapore and Spain)[61,62] have a substantially higher average Value Measure – 47.29 vs. 39.67 – and typically have comprehensive policies on the sharing and use of data and sophisticated mobile infrastructure.

2. Integrating EHRs into the e-citizenship agenda

For EHRs to achieve their full potential as part of an integrated healthcare environment, they have to be part of a broader push that makes people and institutions accustomed to the digital delivery of public services and the effective and responsible use of personal data. There are signs that the general population is already engaging with their health data – across all countries surveyed, 63% of those who have used connected care technology have shared data from that technology with HCPs.[63]

3. EHRs: Securing the support of healthcare professionals

While doctors (88%) and nurses (89%) across all countries surveyed see integration as extremely or somewhat important, a far smaller number (24% and 32%, respectively) currently view the health system as very or completely integrated.[64] This is due to a degree of resistance towards EHRs that can prevent them from being deployed in the normal way, with 40% of primary care physicians believing that they create more challenges than benefits.[65]

4. EHRs: Enlisting payers in the drive for adoption

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[60] *Future Health Index. (2017).*
[61] The Commonwealth Fund. (2010-2015).
[62] WHO. (2010-2015).
[63] *Future Health Index.* (2017).
[64] Ibid.
[65] Doctors Call for Overhaul of electronic Health Record. (June 4, 2018). Retrieved from https://www.prnewswire.com/newsreleases/doctors-call-for-overhaul-of-electronic-health-records-300659100.html

The more frequent integration of EHRs into insurance offerings could further boost adoption, thereby accelerating the journey towards value-based healthcare. There are signs that this is already taking place, with nearly half of insurers polled saying they have already incorporated access to EHRs into their offerings and/or pricing for customers.[66] This shows that there is a clear business case for insurers to support EHRs.

5. AI: Enhancing public trust in AI and data analytics

The FHI has identified AI as a significant contributor to a healthcare system's ability to provide data-driven care. While AI adoption stands on relatively fertile ground, with 54% of people across all countries surveyed willing to engage with AI for healthcare needs,[67] there is still a level of apprehension surrounding the technology. A key element is the general population's concerns about losing the human relationship in healthcare, making it clear that patients generally want AI to assist healthcare professionals, rather than replace them.

6. AI: Transforming health organizations into data organizations

While AI is already reshaping the medical sector, there has to be a concerted effort from the top in order to ensure implementation is a success. Projects often entail the overhauling of established structures and processes, along with the inevitable complication with the way that budgets are structured. Without senior executive buy-in and the right skills on board these barriers will simply not be overcome.

7. AI: Freeing healthcare professionals to focus on value

AI solutions have the ability to process and analyze vast amounts of data incredibly quickly and, when used in the right way, can reduce the time HCPs spend on managing and interpreting data. For example, AI has been shown to be 5%-10% more accurate than the average physician.[68] However, HCP views on AI vary widely, and until a general understanding is grasped, they won't have their time freed up to focus on the higher-value activities that AI can allow for.

8. Consumer wearables: Contributor to improved healthcare, or complication?

Wearables have gained popularity and use among the general population, allowing consumers real-time, readily available health-related data that resonates with them. For example, 87% of Americans who use connected care technology say wearables have helped them take better control of their health.[69] However, they aren't being integrated into health systems – less than 10% (ranges from 4% to 8%

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[66] *FHI Insurer Data.* (2017).
[67] PwC. (2017, June 1). *What Doctor? Why AI and Robotics Will Define New Health*. Retrieved from https://www.pwc.com/gx/en/industries/healthcare/publications/ai-robotics-new-health/data-explorer.html#!/Q/1/stackedbars?cut=Territory&Tecf=0
[68] Pearl, M.D. Robert. (2018) "Artificial Intelligence in Healthcare: Separating Reality from Hype." Forbes Magazine. Retrieved from: www.forbes.com/sites/robertpearl/2018/03/13/artificial-intelligence-in-healthcare/#773bc6551d75.
[69] *Future Health Index.* (2017).

depending on the phase of the health continuum) of healthcare professionals across all countries surveyed, think connected care technology is always being used across the health system. [70]

IV. KOL Toolkit

Potential questions for KOLs

- How important do you believe connected care technologies are in driving value-based healthcare in Africa?
- South Africa does not have a universal EHR and the data collection score for EHRs is lower than the 16-country average within FHI.[71]
    - Why do you think this is?
    - Do you believe a universal EHR could ever be implemented in South Africa?
    - How important do you think EHRs are to both the public and HCPs in South Africa?
- Infrastructure and educational improvements are required to support EHR implementation in South Africa – the internet penetration rate is 54% and 84% of people who have used connected care technologies report understanding how to properly use it.[72]
    - Is the infrastructure or educational element more important here?
- Overall, healthcare providers in South Africa most frequently cited accessible, secure information sharing platforms between HCPs as the healthcare technology that will have the most positive impact on citizens trying to take care of their health (31%).[73]
    - Do you agree with this? If not, what do you believe will have the most positive impact?
    - What can be done to drive positive sentiment towards EHRs?
- Are there any current AI initiatives in South Africa that are working particularly well, whether in healthcare or another industry?
- Only 37% of South Africans claim to be knowledgeable about connected care technologies, and only 66% of healthcare professionals claim to be knowledgeable.[74]
    - What can be done to boost education, and whose responsibility is it to educate both the public and HCPs?
- Among South African HCPs surveyed for the FHI, only 3% felt that robot healthcare professionals are the AI tool that would have the most impact on improving healthcare today.[75]
    - Do you agree with this?
    - What areas do you think AI can have the most impact in healthcare?

[70] *Future Health Index.* (2017).
[71] Ibid.
[72] Ibid.
[73] Ibid.
[74] Ibid.
[75] Ibid.

- Nearly half of the population (49%) in South Africa surveyed for the FHI reported using connected care technology to monitor a health indicator, with weight being the most frequently monitored health indicator (28%), followed by blood pressure (23%).[76]
    - Are these the best uses of connected care technologies, or should we be looking to other use cases?

V. Recommendations

EHR interoperability: From aspiration to reality

- *EHR interoperability should be based on standards that are open and accessible to all* – it requires trust, the participation of stakeholders, and standardized business rules and identity management approaches
- *Efforts to advance interoperability should focus on results, not processes* – it is essential to underline interoperability's value and the positive outcomes it drives
- *Interoperability must involve all stakeholders* – particularly patients, who usually play the deciding role in the use of their data. Interoperability needs to be based on the collaboration of different actors in the system

Integrating EHRs into the e-citizenship agenda

- *More must be done to educate citizens on where, when and how to use and exchange data* – education on data sharing and use is vital if it is to become part of a broader national fabric
- *Rules and practices around EHRs are most effective when they are part of broader approaches to data and digitization* –e-services in healthcare should integrate as much as possible with structures of general e-services
- *Privacy and security concerns must be addressed through regulatory frameworks* – these concerns can be addressed by the implementation of robust national standards

EHRs: Securing the support of healthcare professionals

- *Medical school curriculums must better prepare HCPs for a more connected healthcare environment* – attitudes of medical schools need to change so that new technologies are seen as the tools doctors need to practice medicine
- *Healthcare technology providers should design EHRs and other tools based on HCPs' needs* – HCPs should be involved earlier in the development process for EHR solutions
- *EHRs should incorporate emerging technologies to promote ease of use* – advances in technology should make health information systems more user-friendly

EHRs: Enlisting payers in the drive for adoption

- *Insurers should be looked at as leading potential drivers of EHR proliferation and use* – insurers can often move faster than the public sector so are freer to pursue innovation
- *Governments and HCPs should encourage the efforts of insurers to integrate EHRs into their offerings* – insurers can't go it alone in creating or promoting EHRs so feedback from all stakeholders and patients is important

[76] *Future Health Index.* (2017).

- *EHR solutions should be pursued cooperatively, taking a cue from the customer-centric approaches of insurers and start-ups* – working with outside organizations can help payers to develop solutions more attuned to the needs of the patient or healthcare professional

AI: Enhancing public trust in AI and data analytics

- *Patients should be involved in the development of AI projects* – working with those that will use the technology will build credibility in the eyes of the general population
- *Regulators should develop frameworks and standards for AI* – regulation will play a part in fostering public trust
- *The positive effects of AI should be communicated to encourage engagement* – there needs to be more evidence that draws direct lines between the use of AI and enhanced patient experiences and outcomes

AI: Transforming health organizations into data organizations

- *Senior management needs greater representation from technologists and entrepreneurs* – there needs to be a change in the administrative makeup of the typical healthcare institution in order to encourage fresh thinking
- *Healthcare executives should increase interaction with other sectors* – for AI to play a greater role in care, drawing lessons from deployments in other industries will cultivate the skills, mindsets and organizational structures required
- *Technology skills need to be reinforced with effective governance* – establishing an AI-ready culture will require internal marketing and the demonstration of progress made
- *Senior leadership needs to be convinced of the final case for AI* – demonstrating return on investment, whether either on the balance sheet or in patient outcomes, is required to convince senior executives

Freeing healthcare professionals to focus on value

- *Institutions and technology providers need to better communicate AI results* – the more evidence there is of AI adoptions producing efficiency or other gains, the more HCPs are likely to adopt these tools
- *Change management programs are needed to address HCP concerns* – there is a need to sensitively tackle worries about job losses, especially in areas such as radiology where AI is gaining headway
- *AI providers and institutions should concentrate on ease of use* – AI needs to be designed with the end-user in mind and deployed in a way that minimizes disruption to existing systems and processes

Consumer wearables: Contributor to improved healthcare, or complication?

- *HCPs and the general population should be aware of the weaknesses of consumer wearables* – significant changes are needed for the role of consumer wearables to be consistently positive
- *Regulation and standards are needed for consumer wearables to play a more constructive role* – official standards could help increase patient empowerment

VI. Activation

Market toolkit

As per our first report we will be supplying you with a toolkit of assets to use for launch which includes new assets such as infographics as well as updated assets such as speaker slides.

Your toolkit can be found on the hub and includes:

Guidelines

1. KOL Engagement email
2. Partner Comms email

Content

1. Global press release
2. Media pitches
3. By-lines (x3)
4. Update Speaker pitches
5. Update Speaker slides
6. Infographic
7. Social media graphics / templates
8. LinkedIn executive blog posts

Please reach out to the FHI team for further questions and help with local asset creation.

VII. APPENDIX: Methodology Information

The Value Measure and Current State were developed using a variety of metrics from third-party sources as well as the 2016 and 2017 Future Health Index survey data. For the full methodology, please reference the FHI 2018 Global Report.

Summary of Sources

All data included in this report comes from a variety of third-party sources as well as the 2016 and 2017 Future Health Index data. For the full methodology and list of sources, please reference the FHI 2018 Global Report 2.

1) Third-Party Data

Third-party data was obtained from a variety of sources including publicly available data and, data purchased by OVC on behalf of Philips. All sources of purchased data were vetted by OVC Research and Analytics on behalf of Philips. Data from publicly available sources included databases, such as the World Health Organization and World Bank, among others.

2) 2016 and 2017 Future Health Index Data

Original research was also used to further enhance the research. Since 2016, Royal Philips has conducted ongoing, original research to better understand perceptions towards connected care technology and the role it plays in the future of healthcare.

Survey Research: HCPs and General Population / patients
In partnership with IPSOS, an independent global market research firm, a survey was fielded from February 24 to April 8, 2016 in 13 countries (Australia, Brazil, China, France, Germany, Japan, The Netherlands, Singapore, South Africa, Sweden, UAE, UK and US) among 2,659 healthcare professionals (HCP) and 25,355 patients (defined as consumers who have visited a HCP within the last three months) in each country.

This research, in partnership with IPSOS, was continued in 2017 among HCPs and the general population in 19 countries (Argentina, Australia, Brazil, Canada, China, France, Germany, Italy, The Netherlands, Russia, Singapore, Saudi Arabia, South Korea, South Africa, Spain, Sweden, UAE, UK and US) from January 18, 2017 to March 3, 2017. A total of 3,891 HCPs and 29,410 adults (representative of each country's respective adult population) were surveyed in 2017.

To expand the reach of the Future Health Index, the survey was fielded from February 16, 2018 to March 26, 2018 in India only. A total of 216 HCPs and 1,557 adults (representative of the national adult population) were surveyed.

Survey: Research: Insurance Professionals
In partnership with Braun Research, Inc., an independent market research firm, insurance professionals were surveyed online from February 11 – March 1, 2017 in China, France, the Netherlands, the UK and US. A total of 151 insurance professionals were surveyed.

Qualitative Research
In 2017, to provide context to the survey data, the research was supplemented with 30-45 minute in-depth interviews with 10 healthcare professionals in each market (190 in total). The interviews were conducted in partnership with Schlesinger from January 24 - February 16, 2017. Interviews were conducted in-person or over the phone.

Value Measure & Current State

The Value Measure and Current State were developed using a variety of metrics from third-party sources as well as the 2017 and 2018 Future Health Index survey data as described above (see Summary of Sources)..

Full List of Metrics (Value Measure and Current State)
Metrics used from the survey are in **green**, third-party metrics are in **grey**.

Value Measure

Access	Satisfaction	Efficiency Score
Skilled HCP Density, 2013-2016	GenPop – How much do you trust the healthcare system in your country?	HC Spend as % of GDP, 2014

Risk of Impoverishing Expenditure for Surgical Care, 2014	GenPop – How much do you agree that the healthcare available to you via the health system in your country meets your needs?	TB Treatment Success Rate, 2015
Hospital Beds per 10,000, 2009-2015	HCP – How would you rate healthcare overall in your country?	Healthy Life Expectancy at Birth, 2016
	HCP – How much do you trust the healthcare system in your country?	Life Expectancy at Birth, 2016
	HCP – How much do you agree that the healthcare available to patients via the health system in your country meets their needs?	Probability of Dying from CVD, Diabetes, CRD between Age 30 and Exact Age 70, 2016
		Neonatal Mortality Rate, 2016
		TB Incidence, 2016

Current State: Data (Collection & Analytics)

Data Collection		Data Analytics
EHRs	**Wearables**	**Intelligent Care**
Global Electronic Health Record Market, by End-Use - Hospital Use EHRs, 2016 (USD Million)	Fitness Wearables Users, 2016	Artificial Intelligence in Healthcare Market by Application - Preliminary Diagnosis, 2016 (USD Million)
Global Electronic Health Record Market, by End-Use - Ambulatory Use EHRs, 2016 (USD Million)	Global Wearable Medical Devices Market, by Region/Country, 2016 (USD Millions)	Healthcare Artificial Intelligence Market by Application - Therapy Planning, 2016 (USD Million)
Existence of a Universal EHRs, 2010-2015		
Market Size - Software Solutions - Clinical Decision Support System Solutions, 2016		
Market Size - Software Solutions - Computerized Physician Order Entry, 2016		
Market Size - Software Solutions - Electronic Medication Administration Record, 2016		
Market Size - Software Solutions - Inventory Management Solution, 2016		

Current State: Care Delivery

Telehealth	Diagnostic & Treatment Solutions		
	IGT	Imaging	Assisted Surgery
Number of users of pay-to-use apps for connected medical devices for use at home and for telemedical services relating to remote patient monitoring, 2014	Image Guided Therapy Systems Market - 2016 (USD Million)	X-Ray Market, by technology - Digital, 2016 (USD Million)	Global Surgical Robotic Procedures Market Revenue – Overall, 2017 (USD Million)
Telemedicine Market Estimate by Country, 2016 (USD Millions)		CT Market, by type - Advanced, 2016 (USD Million)	
Global Remote Patient Monitoring Devices Market, by End-Use - Hospital-based Patients, 2016 (USD Million)		MRI Market, By Field Strength High, 2016 (USD Millions)	
Global Remote Patient Monitoring Devices Market, by End-Use - Home Healthcare, 2016 (USD Million)		SPECT Market, by Product - Digital, 2016 (USD Million)	
Global Remote Patient Monitoring Devices Market, by End-Use - Ambulatory Patients, 2016 (USD Million)		PET Market, by Product - Digital, 2016 (USD Million)	

Technology Infrastructure & Policy

Technology Infrastructure	Policy
Internet penetration rates, 2016	Regulation/legislation around which EHR platforms to use, 2014-2018
Secure servers per Capita, 2016	National vs. regional policy on EHR, 2015
Average Speed of Internet in Kbits/sec, 2016	Accreditation for wearables, 2014-2018
Mobile Cellular Subscriptions per Capita, 2016	Policy on data protection, 2014-2018
Availability of 3G or better, 2016	Regulation/legislation for data protection/security, 2014-2018
Overall Mobile connection speed (MPS), 2016	Regulation/legislation around data sharing, 2014-2018