



Evolving the Understanding of the Patient

EXPLORING PATHS FROM A DISEASE-CENTRIC
TO A HUMAN-CENTRIC MODEL

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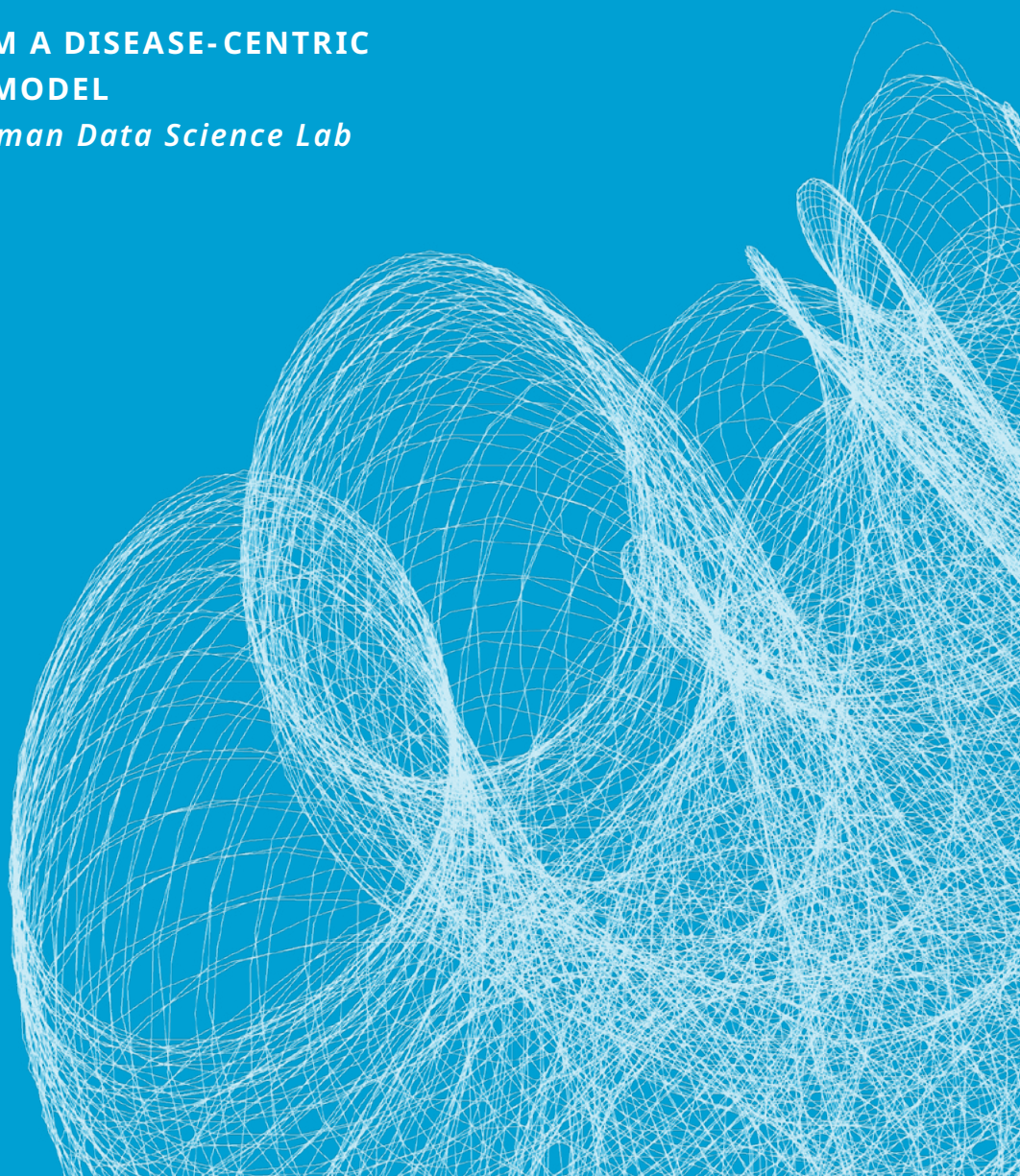
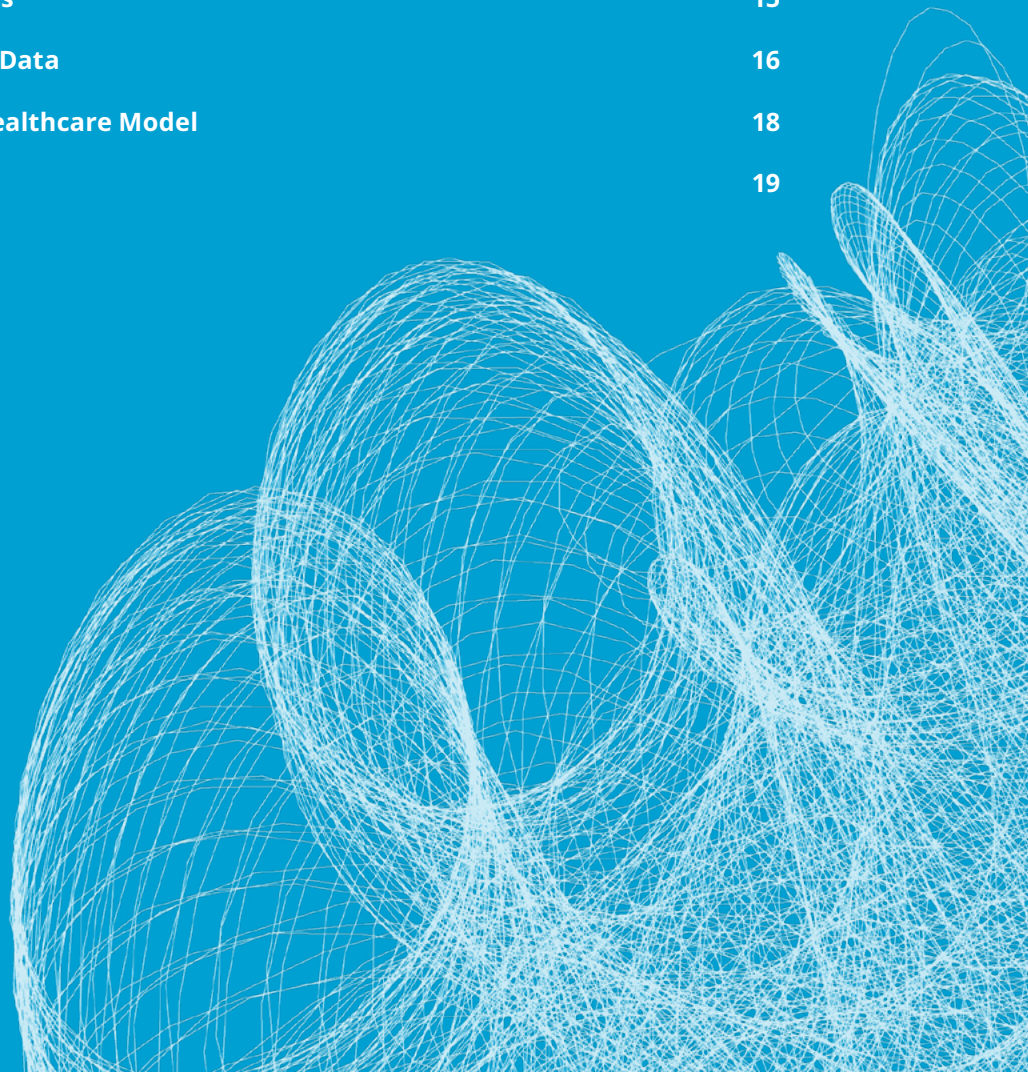


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1. Introduction

Changes in society, demographics, healthcare, science, and technology are increasingly challenging the traditional concept of the “patient” as something many now see as patronizing. Fundamentally, the notion of the individual as a passive recipient of healthcare services is quickly becoming out of touch with the new understanding of the importance of proactively treating patients as whole persons, whether they are active, inquisitive consumers empowered by digital technologies or elderly, frail or vulnerable people needing a holistic human approach. The term “patient” fails to capture the broader essence of the human being, as it typically refers to a representation of medical condition or injury.

The discussion is not new. More than 100 years ago, William Osler famously expressed the importance of physicians caring for the individual patient more than the features of the disease, thoughts that were echoed in 1932 by A.H. Gordon, who impressed the need to “treat a patient as a person, not merely as a representation of medical, surgical or pathological material.”¹ (See Figure 1).

Over the last several years, there has been a growing focus in the healthcare industry on patient engagement and empowerment under the banner of “patient-centricity.” Simultaneously, there has been a rising call for transforming healthcare from a system focused on sickness to a system focused on health and wellbeing.

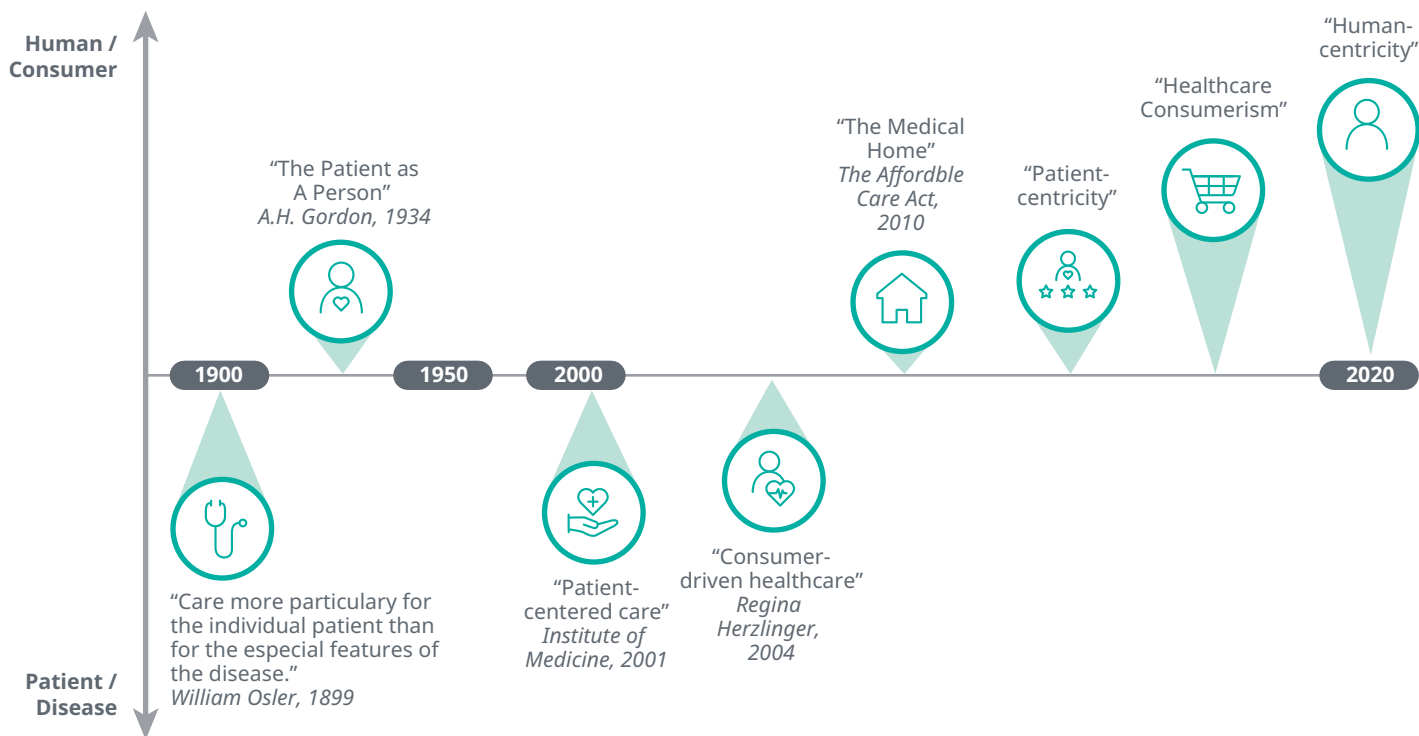
However, the question is whether “patient-centricity” fully captures the ongoing transformation from a disease-centric to a human-centric model. This question is also supported by medical research pointing to the important role of factors outside of the traditional healthcare field having a fundamental impact on health, such as social, cultural, ethnic, and environmental dimensions.

Furthermore, medical science has generated a deeper understanding of the important role of pre-disease on health outcomes- before people are symptomatic or identified as “patients” - and has cast light on opportunities for earlier intervention to prevent, intercept or halt disease progression. Finally, the COVID-19 pandemic has dramatically highlighted the limitations of the single-disease view, as we have witnessed the detrimental role of comorbidities in the severity of outcomes.

The question is whether “patient-centricity” fully captures the ongoing transformation from a disease-centric to a human-centric model. This question is also supported by medical research pointing to the important role of factors outside of the traditional healthcare field having a fundamental impact on health, such as social, cultural, ethnic, and environmental dimensions.

¹ Gordon AH. The patient as a person. The Canadian Medical Association Journal. Aug. 1934.

FIGURE 1: The historic evolution of the concept of “the patient”



Ultimately, we are faced with an imperative to consider human health beyond just the patient experience, drawing on data science capabilities applied to human science capabilities, and apply **Human Data Science** to rethink our concept of the “patient” - focusing on the human being at the center of a holistic approach across all aspects of health and wellness.

In pursuing this imperative, the IQVIA Institute for Human Data Science brought a multidisciplinary group

of experts together on November 17, 2020, for a virtual Human Data Science Lab to explore the paths from a disease-centric to a human-centric model.

The discussion was shaped around a number of provocative questions addressing the concept of the patient, its limitations, and the potential directions for a new approach.



Ultimately, we are faced with an imperative to consider human health beyond just the patient experience, drawing on data science capabilities applied to human science capabilities, and apply Human Data Science to rethink our concept of the “patient”.

2. Considering the Concept of “The Patient”

The discussion took as its initial vantagepoint the following question: How can the concept of “the patient” better reflect current social, demographic, cultural, and scientific realities seen from the perspective of the patient advocate juxtaposed with the view of the healthy volunteer? The discussion revealed an emerging consensus around replacing the notion of the patient with the idea of the individual person, looking holistically at a human being with a life continuum – whether healthy, at risk of disease or with a diagnosed condition – and a unique individual with personal beliefs and behaviors.

From the patient point of view, social norms and perceptions are impactful when you engage with healthcare services. As an example, the moment a person goes into a hospital setting and puts on a gown, the perception changes immediately. There are many people who must change their norms in different settings before these perceptions change and help develop a better view of what the patient is. But it is also important to recognize that people are different; some patients would like to be told what to do by

their trusted physician, while others want to participate in shared decision-making and handle their own investigations.

There was general consensus among participants that the concept of “the patient” is not ideal and that “person” is a better term to use, as in “person-centered health.” It is important to take into account that people are individual human beings with different perspectives on their healthcare and very different personal beliefs.

The model from the University of Leicester was mentioned as a robust approach to understanding the role of personal belief when it comes to medicines, including data showing that about 25% of the population doesn’t believe that medicine will change their fate and may even be bad for them. One axis shows whether it is good for you or whether it is poison, the other axis indicates your belief in faith, and whether you are in control of your health no matter what happens. Understanding how people have very different perspectives on health is key to understanding the behavior that drives how people interact with the healthcare system.

“We also have to look at things from the point of view of the life continuum. One day, we are healthy, another day we may have a predisposition for a disease, and then again, we may develop a disease. We see this evolution now where we better understand the importance of early-age onset of colorectal cancer and that young people get the disease. Therefore, it makes sense to shift the perspective from a patient to an individual who happens to have some sort of predisposition or disease and think about it along the continuum from early prevention all the way until death.”

Barry Stein, President, Colorectal Cancer Canada

The understanding of the concept of the patient should also be viewed in the context of the changing dynamics in society. It was suggested that there are four different corners of a diamond when you think about this. The patient is in one corner. The second corner is the healthcare delivery system, the third is technology, and the fourth is the increasing understanding of biology. The diamond has been changing over time. Early in

medicine, the physician went to people's home. Then care moved to brick and mortar practices as specialties grew and people were given more options. And then the person would go to the hospital as opposed to the physician going to the patient's home. The key is how we integrate these four verticals into a holistic view of the person.



"The discussion whether the patient is the right term raises the intriguing question of what the difference is between the person who shops at Walmart and the person who goes there for healthcare needs. It's the same person. When I walk into a Walmart or any facility, I am who I am. The notion of us as human beings is really a powerful thing to bring into healthcare. It also starts to get closer to what I can do as a primary care physician, whether it is to manipulate your physiological systems to overcome a pathology or help you live a healthier life, a better life. I don't know what the best term is, but I'm all for broadening the term and exploring what we can do better to bring our language to reflect the reality of health and healthcare today."

Thomas Van Gilder,
Chief Medical Officer at Walmart

3. Shifting the Perspective from the Patient to the Consumer

The discussion moved further to explore the shift from patient to consumer, more appropriately embracing the patient as a consumer.

A focus of this discussion was on the transition from looking at the person as a patient to a consumer. This is the approach Walmart has been taking when evolving from a consumer retailer business to a healthcare provider.

Walmart went from a large consumer retailer that opened its first pharmacy in the late 1970s to offering vision care, and over the last couple of years to providing longitudinal primary care.

This also raises the question of whether the many different roles we play as people make the heavy label "patient" as relevant as it has been over the years.



"We have seen an evolution from product-centric to patient-centric, but for purposes of this discussion, person-centric feels right to me. People exist as human beings first. If you look at people's search behavior online, they may have a question about a health condition, but then they may go to shop at Walmart to see what's on sale this week. So, I think we are in the right realm if we reclassify a patient so that we take into account their whole world, not just their life as a patient."

Robin Shapiro, CEO of TBWA/HealthWorld

This broader perspective is also essential when we look at the diversity of patient populations, as many diseases impact diverse communities very differently, so illness can't be viewed in just one dimension. One example is sickle cell disease, which largely exists in the

African American population. The culture around that disease is an important part of the experience of the disease itself and should be taken into account when you communicate around that condition.



"As I think about the healthcare delivery model, the blueprint for care, the way we do our work should deliver all the outcomes. There shouldn't be a patient experience initiative. There shouldn't be a cost-saving initiative. The way we do our work should reliably deliver the patient experience, pre provider experience, the financial value and the clinical outcome in a highly reliable way. The concept is that if you do the three strata of interactions with the patient – the standard work, the common cause-variations and condition-specific work – really reliably well within the four walls of the hospital, then the people involved in the delivery of patient care can focus on the patient experience. Today, I believe most hospitals are still focused on doing service recovery or throwing enhancements at it. That's like having leather seats in your car that breaks down regularly, but it does not take you where you want to go."

Daniel W. Varga, Chief Physician, Hackensack Meridian Health

— 4. Putting People at the Center of Designing Trials and Healthcare Delivery

As the panel dug deeper into the urgency to treat people as individuals, the question was raised about how clinical trials could become more engaging and personalized.

Understanding of the needs of the individual and demonstrating empathy is critically-important when conducting clinical research. This approach is central to Verily's efforts to make the clinical trial experience more patient-centered.

One of the fundamental things that Verily has brought in from Google is the concept of user-centered design.

Project Baseline at Verily, a Google company, has taken the Google profile of people and mixed the approach of UX designers, researchers, product managers, software engineers, and hardware engineers with clinical experts and scientists, to build actual consumer behavior and data-driven insights to address the needs of consumers.

Verily took the same approach when designing Onduo, a virtual diabetes clinic that helps people with diabetes to better manage their condition. A team went to Georgia and spent time with people in their homes and grounded themselves in understanding how different people with diabetes go about managing their condition, including what works and what doesn't.



“When we start designing a trial or explore how we can manage diabetes differently, we bring UX researchers into people’s homes. Fundamentally, it is about putting people or the user at the center when you are designing services, business offerings and products.”

Cas Starsiak, Head of Project Baseline at Verily

5. Addressing the Reality of Comorbidities and Multidisease

Taking a consumer- or human-centric approach also leads to realizing the realities of multidisease, the fact that people are not defined by or suffering from only one condition, but potentially several different conditions, many of which intersect.

The question is how do specialized hospitals and healthcare provider organizations evolve to manage multimorbidities and multidisease?

When looking at the data for inpatient morbidity and mortality outcomes, there is no difference inside the four walls of the hospital, for example when comparing an African American male to a white male with COVID-19. However, outside the hospital, there are enormous disparities.

The question arises on how biopharmaceutical companies that develop molecules targeting specific pathologies for clinical development to seek approval of certain indications and labels address the realities of multidisease? Comorbidities and multidisease that were unmasked during the COVID-19 pandemic were not created by COVID-19, but the pandemic amplified what was recalcitrant in the system for years.

This has sparked renewed efforts to enhance a multicultural approach to trial recruitment and doing things differently with many partners to find patients in disadvantaged communities and to address social determinative health factors during the clinical trial experience. This has been evolving for some years, but has been accelerated and amplified because of what COVID has brought to the light.

For many years, pharmaceutical companies relied on other players in the health system to solve a number of challenges relating to health inequities, assuming that the role of pharma companies was to launch and optimize affordable access to breakthrough medicine and vaccines. Now pharma companies realize that they need to solve for these disparities of clinical development and care alongside other partners. However, when adding these dimensions, such as multimorbidities and multidisease, pharmaceutical companies will need to identify and isolate such variables and their effect on the disease state, which requires more power of data and the application of advanced analytics.

“The specialized hospital is less of an issue than the care delivery model. Once you are outside the four walls of the hospital, there are radical differences. My longest experience in healthcare is in rural Kentucky. The single most valuable thing you can give a person with diabetes or heart failure is a refrigerator with the right food in it. That’s why I am a huge proponent of population health management, which you only get if the procurer of health services assumes the financial risks of care. The amount of creativity and person-centricity you see in the best Medicare Advantage health plans is staggering. The reason is that they are taking the full risk and have a longitudinal view of the population.”

Daniel W. Varga, Chief Physician, Hackensack Meridian Health

6. Treating the Patient, not the Disease

The conversation turned to the fact that people are different and have different preferences.

One key point of discussion was that some patients are very passive and just want to be told what to do, while other patients want more information; they want to know what to do and maybe why they should do it. Other patients want to be more proactive by understanding the alternatives and remaining part of decision-making.

The question about where the patient is in the disease progression also plays an important role. As an example, in cancer, patients are moving between being passive and proactive as the disease becomes worse. The importance of emotional and behavioral factors has been underestimated. The emotional status of a patient in treatment can be very empowering and change the results of the quality of life or quality of care.

This is essential for *Belong.life*, a global cancer patient engagement and research network. *Belong.life* builds a profile of each patient that incorporates not just name, nickname and faces, but also their personal approach to how best to improve their quality of life during treatment.

“One of our interesting, surprising findings is that people with Multiple Sclerosis (MS) tend to be more depressed than cancer patients, even though patients with MS are on a very long journey and live longer with their disease. Cancer patients don’t get depressed that often, even despite a short life prognosis, because cancer patients often feel they are fighting for their life, whereas MS patients often feel that it is just downhill all the time. However, once you treat them in a way that conveys it can be better, their quality of life can improve. Our motto, which I see today among many physicians, especially in cancer and in MS, is this: Treat the patient with the tumor and not only the tumor in the patient.”

Eliran Malaki, CEO of *Belong.life*

7. Building Evidence for the Value of Engaging Patients

As more efforts are devoted to engaging patients in many aspects of their care, the question was raised around what evidence has been delivered for the value of these efforts, and whether real world data provides a solution.

Clinical trials have had a long history of being conducted in narrow populations, which results in lower generalizability. Therefore, over the past few

years, there has been a growing focus on real world data. Better understanding of multimorbidities is one of the authentic advantages of using real world data to enhance what we know about comorbidities and the effectiveness of medications in various illness groups.

“When we think about the importance of ensuring diversity and inclusion, this can be really bad news due to the lower participation of historically-marginalized populations in clinical trials. Therefore, real world evidence and the application of advanced analytics are very important to make sure that findings are robust. But it’s really going to be up to the field of implementation science to take the data and move it into practice, and that is going to be a multidisciplinary effort.”

Emily O’Brien, Assistant Professor of Medicine at the Duke Clinical Research Institute

8. Replacing the House Physician with the Wired Home

One of the most tantalizing promises of digital technologies may be their ability over time to replace the 19th century family physician making house calls with technology in people's home.

There was general agreement that the Internet should become a utility and that every part of the population should have access to virtual care. The COVID-19 pandemic has accelerated support for this. While technology won't remove people's underlying questions about health and fatalism that affect their view on

medicine, it will enable healthcare to get to the patient, rather than the patient coming to where healthcare is based.

As part of the evolution from just treating patients based on science toward human-centric care, we are seeing the emergence of new kinds of companies that are connected. They work with agile teams and break down some of the siloes of different parts of the care continuum, with the goal of bringing them together to work in a new way toward better outcomes.

"I don't see a downside in technology going into people's homes. I think it is the reverse. It is the reverse of the dehumanization that happened when the physicians of the 19th century no longer paid regular visits to a person's home. The house physician of the old days knew the person and the entire family, and they understood the challenges that the patient was dealing with in other elements of his/her life. I think that technology has the power to change the relationship between physicians and the person with the disease."

John Glasspool,
CEO of Anthos Therapeutics

"When you create human-centric design experiences, patients enjoy the experience, they engage with it, and they will get better. So, I'm very fascinated with the idea of merging pharma or biotech companies with design companies and with communication specialists because I believe that is the right holistic treatment. It is not just about a pill."

Robin Shapiro, CEO of TBWA/HealthWorld

9. Defining a New Vernacular for “The Patient”

Given these transformational shifts in society, culture, health, technology, and science, what is the right vernacular, if we want to replace the patronizing, outdated term of “the patient?”

The participants were in agreement that “person” is the best term.

The evolution of Walmart beyond a consumer retailer to also becoming a healthcare provider provides an interesting angle to the discussion of the term “patient” vs. “consumer.” The comments about the “person” vs. the “patient” reflects the conversations at Walmart when the retailer opened its new health centers.

“The person is the key point. People with hemophilia are people with hemophilia. They’re not hemophiliacs. People don’t have a disease, they’re a person with a disease. I also think “person” is more important than “human” because “person” captures the experience of the individual vs. “human” that indicates how we were created. “Person” captures the experience we go through for life that shape our beliefs and our perspectives and insights on how we manage ourselves.”

John Glasspool, CEO of Anthos Therapeutics

“We began to think more holistically about people as people, and to think about what their experience is when they come to Walmart, either as a shopper or as somebody seeking healthcare. And we learned a lot on the healthcare side from how the stores on the retail side of the business have thought about people and how they have derived insights about what people need, and what will lead them to the things they’re looking for most promptly and with the least amount of friction. Bringing that over to the healthcare delivery side was very helpful. How do we make people aware of some of the things they need? How do we deliver it to them with the least amount of friction?”

Thomas Van Gilder, Chief Medical Officer at Walmart

10. Adjusting Regulatory Approvals and Value Assessments

The question was raised whether regulatory bodies and health technology assessments are equipped to take the evolving concept of the patient into account, or whether we need new frameworks?

In most countries, personalized health solutions and precision medicine with next-generation sequencing are getting ahead of the approval processes and health technology assessment bodies. One of the ways to capture the individualized personal experience is through real world data and collecting insights from patient input, for example, through the *Belong.life* app.

The other way to get individualized information is through genetic information and precision medicine. However, the problem is how we utilize this individualized information, when all the infrastructure around us is forcing us to go through different funnels in order to get drugs or procedures approved.

Participants emphasized the progress that is happening on this front, for example, around clinical outcomes assessment and patient-focused drug development.

This is an area where regulators and payers need to be innovative to make sure to consider patient preferences, not merely traditional clinical assessments. It's important to value the humanistic side, which is more focused on quality of life and economic considerations.

Economic aspects are also highly variable dependent on the individual person. Out of pocket expenses are different for different people, and affordability can mean different things. Some patients can afford an outlay of expenses if it is spread over time. Other patients can't afford it at all because of the size of the amount or their personal financial situation.

Overall, it was acknowledged that the pharma industry has made great strides, including incorporating the patient perspective in the way endpoints are selected and designed. However, more needs to be done in terms of measuring the heterogeneity of preference.

Furthermore, social components of preference are important, which is not just whether a patient has caregiver support, but also how they interact socially when accessing healthcare, just like they would as a consumer. Breaking these factors down into their components allows for a more specific and customized measurement of patient preference.

Another element of understanding those preferences is health literacy, which is often overlooked by healthcare providers.

11. Measuring Inputs vs. Outcomes of Individualized Treatment

Some participants emphasized the importance of clarifying how health systems measure whether they deliver against patients' preferences. This raises the question of how the healthcare system is coping with the right care movement, the emerging demand for bringing the right care to the right person at the right time, and not overtreating or undertreating.

It was suggested that we should think of treatments in four P's: personalized, precision, prevention, and phenotype. We need to start treating people as individuals, even if we are treating them with an identical product. We need to understand the holistic nature of how we are managing that patient. And we need to take into account people's personal belief in medicine and in faith.

Patient associations, including Colorectal Cancer Canada, have worked on understanding what weight the healthcare system is giving to people's individual values and preference. It is one thing to gather those preferences and determine what they are. The question is, what weight do these preferences carry in decision-making and who is going to determine that? We do see HTA-bodies that take into account patient preferences and personal values. But it's really a challenge to determine what weight they put on them, or whether they use patient preferences to confirm decisions that are made for other reasons, such as cost-effectiveness and clinical benefit.

"The problem is that all of our healthcare systems – whether in Canada, the U.S. or the UK – are built on inputs, not on outcomes. And when we talk about patient preferences, they are predominantly around outcomes, whereas the system is set up to measure inputs. What drug did you get? What test did you take? Which surgical procedure did you have? No one spends the same amount of energy capturing the outcomes that would support the importance of those preferences. That also hinders applying the real world evidence, the overall data collection and the heterogeneity of the response because we are measuring what we are giving people, not what they are benefitting from."

John Glasspool, CEO of Anthos Therapeutics

12. Exploring Radical Collaborations

New, disruptive pricing models also trigger considerations about new types of collaborations that bring life sciences companies, providers, patient groups, payers, technology companies, design companies, and other non-traditional partners together. How is this possible in a highly fragmented healthcare industry with siloes and conflicting interests?

"Our system has largely been built on competition. We are all specialists in one part of the big picture, and we have a habit of siloing the functions or the pieces of the puzzle that actually need to collaborate. I am a big believer in purposeful and even radical collaboration as a means to creating different or disruptive outcomes. There are great possibilities in the minds of the people around this table. How can we work together to recast our model?"

Robin Shapiro, CEO of TBWA/HealthWorld

What is the experience when an organization such as 1Day Sooner pursues an entrepreneurial and disruptive model to advance challenge trials for healthy volunteers in infectious diseases?

One learning is that additional value is created when different research groups, such as Oxford and Imperial College, and different vaccine developers among biopharma companies work together to share their collective goods.

"It is helpful to put a gentle but permanent pressure toward making research valuable not only to individual stakeholders, but the wider public. This can be achieved by promoting transparency and sharing of protocols and data across different study teams. In some ways, our group is a kind of proxy for the public. We are creating a major public engagement in research and testing, which the public doesn't generally understand."

Josh Morrison, Co-Founder, Director, 1Day Sooner

The experience from 1Day Sooner's work with kidney donations and kidney transplants also points to opportunities for building a structure that incentivizes the public to give input to research and medical policy in a constructive and positive way, and not just as an item on a checklist. One of the things that Morrison is exploring is the development of an economic stake in donations for transplant organ donors, which would help improve policy.

1Day Sooner is also working on a new initiative for the development of a universal flu vaccine that would create great social and commercial value for industry.

The future opportunities for new collaborations will depend on the creation of additional value so that it becomes a win-win situation for all parties, and not another cost-center that groups will have to pay for.

13. Trusting the Sharing of Patient Data

The engagement of people in volunteer challenge trials raises the discussion around privacy and sharing personal data. Challenge trials for healthy volunteers was mentioned as the potential beginning of a longer-term organization where people are collecting their own data that can be useful for clinical trials and other medical research.

“When you help unlock people’s willingness to share their own data in a context they trust, you can overcome concerns about privacy. If you can create a trustworthy institution that is independent and non-profit, this may be a way to get more data for analysis and for better science than you would be able to get otherwise.”

Josh Morrison, Co-Founder, Director, 1Day Sooner

Some pointed to the challenge of ensuring people’s trust in data and the importance of the data being anonymized.

Others pushed back and referred to experiences that indicate patients care less about their medical records than they care about their financial records. Like in any other matter in life, people focus on what’s in it for them. And if we give them value, they are more than willing to share their data. One of the ways to win patients over is to make them part of the research and get access to the insights.

“We know that many people want to contribute to research when you ask them in the right way. Look at the opportunity to opt into a donor program via your driver’s license that many people take. Most people are happy to contribute to medical science when they are dead. So why not participate in a trial when you are alive? Historically, this ties to the fact that participating in research has not been very patient-centric. It has been centered around the PI, the sponsor,, the academic medical center, whatever it may be.”

Cas Starsiak,
Head of Project Baseline at Verily

Project Baseline at Verily has very positive experience motivating people to participate in research.

Project Baseline is making a special effort to engage people who participate in clinical trials. The Baseline Approach consists of two pillars: the Baseline Community and the trial platform. With the Baseline Community, which has now engaged 100,000 people,

Project Baseline is trying to build a real community where people share self-reported data, medical data, sensor data and other observational data as a way to get involved. From the various patient-reported data, the project has learned about aspects of mental health that have been impacted, how sleep has been affected and what people care about in general. Based on that information, people have been referred to participate in the trials.

The trial platform is focused on giving people a better experience when they join the trial. This involves efforts to decentralize trial interaction so that visits can be done in the home and made more convenient for an individual vs. having to drive to an academic medical center.

Project Baseline is also very focused on returning results from the trial; for example, returning data to participants regarding their cardiovascular health, fitness health and all their standard lab results.

Whether engaging in clinical trials or receiving therapy, it is important to make the healthcare experience more convenient and pleasant in the future – from participating in a clinical trial to receiving medical therapy.

“In the future, the healthcare experience for people that we treat or work with could be as simple and as intuitive as when you get a new Apple iPhone. It is something that doesn’t require instructions. It is so simple and so user-centric and so rewarding that people have made it part of their everyday experience. I see a world where, through empathy and collaboration with multidisciplinary stakeholders, we could create something like that for the healthcare world.”

**Robin Shapiro,
CEO of TBWA/HealthWorld1Day Sooner**

Moving Toward a Person-Centric Healthcare Model

In closing, the discussion during this Human Data Science Lab generated several exciting opportunities for further advancing the evolving understanding of the patient.

IQVIA and the IQVIA Institute for Human Data Science find that the following key themes that emerged during this Human Data Science Lab will warrant further considerations and research endeavors:

- **Establishing a new vernacular around person-centric care** that expresses the concept of the person at the center of all efforts along the entire continuum of care, from early prevention through preventative care and disease interception to therapeutic care and rehabilitation. This will also mean taking a multidisease approach, recognizing that both clinical disease attributes and non-clinical factors of human life impact health outcomes, such as economics, education, social, cultural and personal beliefs, attitudes, personal preferences, and behaviors.
- **Developing a multifaceted understanding of the heterogeneity of populations** to replace traditional segmentation models that are limited to attributes, such as gender, age and race, and instead embrace psychographic, behavioral, attitudinal, and emotional preferences and variations. This will foster the development of new models for researching, analyzing and predicting the heterogeneity of preferences and their role in response to and adoption of new therapeutic innovations.
- **Designing and executing person-centric clinical trials** that recruit, enroll and retain people in clinical studies using engaging, inclusive, interactive, and culturally-sensitive collaborative approaches. This will include novel models for sharing data and insights with study participants, turning clinical studies into personal health-learning journeys for participants.
- **Advancing evidence of the impact of improved health outcomes from person-centric care** by applying clinical trials data, real world evidence and advanced analytics in combination. This will include moving from input-based to outcomes-based assessments of preventative care and therapeutic interventions.
- **Creating a new model for personalized, home-based care, the virtual “house doctor” of the 21st century**, harnessing the full power of digital technologies, virtual care, remote monitoring, and in-home care team services. This will become the beginning of shaping the personal home as the hospital of the future.
- **Exploring new, radical collaborations** that bring together traditional partners – life sciences companies, providers, patient advocacy groups, academic researchers, and payers – with non-traditional partners – technology companies, behavioral scientists, design experts, personal trainers, life coaches, and futurists – to experiment with novel models for person-centric health, healthcare and well-being.

About the Institute



The IQVIA Institute for Human Data Science contributes to the advancement of human health globally through timely research, insightful analysis and scientific expertise applied to granular non-identified patient-level data.

Fulfilling an essential need within healthcare, the Institute delivers objective, relevant insights and research that accelerate understanding and innovation critical to sound decision making and improved human outcomes. With access to IQVIA's institutional knowledge, advanced analytics, technology and unparalleled data the Institute works in tandem with a broad set of healthcare stakeholders to drive a research agenda focused on Human Data Science including government agencies, academic institutions, the life sciences industry and payers.

Research Agenda

The research agenda for the Institute centers on 5 areas considered vital to contributing to the advancement of human health globally:

- Improving decision-making across health systems through the effective use of advanced analytics and methodologies applied to timely, relevant data.
- Addressing opportunities to improve clinical development productivity focused on innovative treatments that advance healthcare globally.
- Optimizing the performance of health systems by focusing on patient centricity, precision medicine and better understanding disease causes, treatment consequences and measures to improve quality and cost of healthcare delivered to patients.

- Understanding the future role for biopharmaceuticals in human health, market dynamics, and implications for manufacturers, public and private payers, providers, patients, pharmacists and distributors.
- Researching the role of technology in health system products, processes and delivery systems and the business and policy systems that drive innovation.

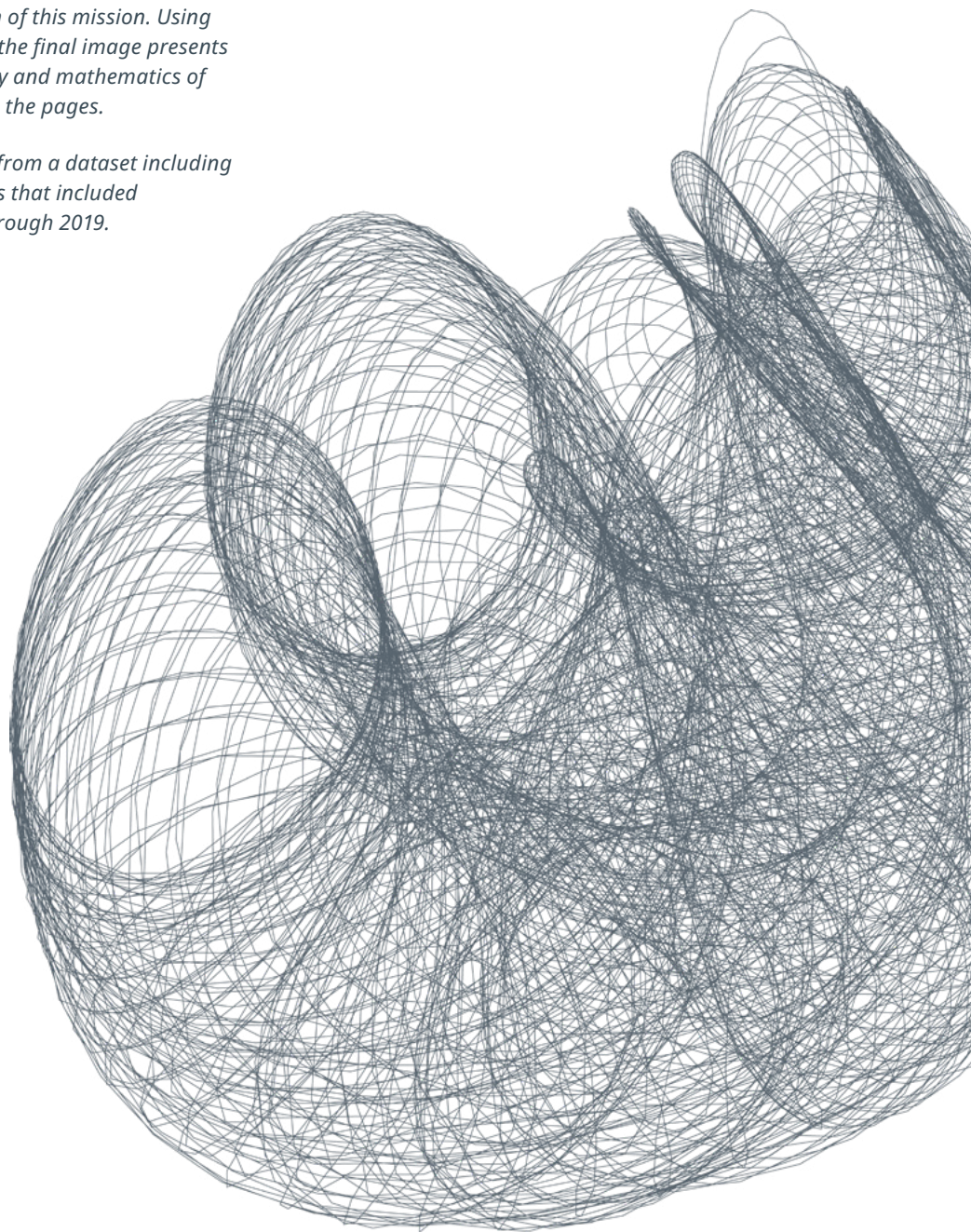
Guiding Principles

The Institute operates from a set of guiding principles:

- Healthcare solutions of the future require fact based scientific evidence, expert analysis of information, technology, ingenuity and a focus on individuals.
- Rigorous analysis must be applied to vast amounts of timely, high quality and relevant data to provide value and move healthcare forward.
- Collaboration across all stakeholders in the public and private sectors is critical to advancing healthcare solutions.
- Insights gained from information and analysis should be made widely available to healthcare stakeholders.
- Protecting individual privacy is essential, so research will be based on the use of non-identified patient information and provider information will be aggregated.
- Information will be used responsibly to advance research, inform discourse, achieve better healthcare and improve the health of all people.

The IQVIA Institute for Human Data Science is committed to using human data science to provide timely, fact-based perspectives on the dynamics of health systems and human health around the world. The cover artwork is a visual representation of this mission. Using algorithms and data from the report itself, the final image presents a new perspective on the complexity, beauty and mathematics of human data science and the insights within the pages.

The artwork on this report cover is created from a dataset including numbers and percentages of oncology trials that includedarmacogenomic biomarkers from 2010 through 2019.



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