

# WTF



WHAT THE **FUTURE** | SUMMER 2018

## HEALTH

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# Are new technologies the key to helping as we get older?

## Everything you need to know about the demographics of healthcare can be found in West Bloomfield, Michigan.

Ealy Elementary School in this Detroit suburb closed in 2013. Enrollment had dropped to just 366 students and the share of school-age kids had been trending downward for decades. Meanwhile, the share of seniors over 65 more than doubled there between 2000 and 2016 to almost 30 percent. It's not surprising then, but telling, that later this year more than 100 assisted living apartments will open on the site.

The middle aged outnumber children in the U.S. today. By 2035, so will seniors. That's a first. In Canada, this inversion has already happened although their cutoff for "children" is a little younger. As we age, and as treatments for major diseases improve, we are living longer — often with a chronic illness. One challenge is that by 2030, the Association of American Medical Colleges projects that the U.S. will have a shortage of as many as 120,000 doctors. We are already relying on our families and loved ones to assist or lead caregiving, which can put a huge burden on relationships and life.

The future of healthcare has challenges to overcome well beyond improvements in diagnosis and treatment. There's an impending crisis for patients and for those who provide them with care.

The hope is that technology, artificial intelligence and connected health ecosystems can help bridge some of the emerging gaps in the continuum of care and create better engagement experiences for patients and caregivers alike. The problem is that healthcare, as an industry, has lagged others that have been more innovative, due to regulatory demands and a generally conservative mindset. The regulatory landscape and traditionally long R&D cycles mean that healthcare and biopharmaceutical companies aren't wired to serve or compete well in a rapidly evolving market.

Of course, it's not just a matter of aging. Health, wellness and caregiving are issues for people throughout their lives.

As you'll see in the discussion with Dr. Sandro Galea, dean of the Boston University Robert A Knox School of Public Health we, as healthcare leaders, need to start by asking the right questions. We need to help educate the consumers about what creates what he calls "demand for health." Cellist Zoe Keating, also interviewed here, puts a very human face on the challenges we need these technologies to help solve. Dr. Joseph Kvedar, Dr. Kyu Rhee and Arielle Burstein start to show us some of the ways artificial intelligence can make the healthcare experience better for patients and caregivers alike. We also dive into behavioral science with Dan Ariely and researchers from Ipsos' behavioral team to show how these techniques can help us live healthier lives.

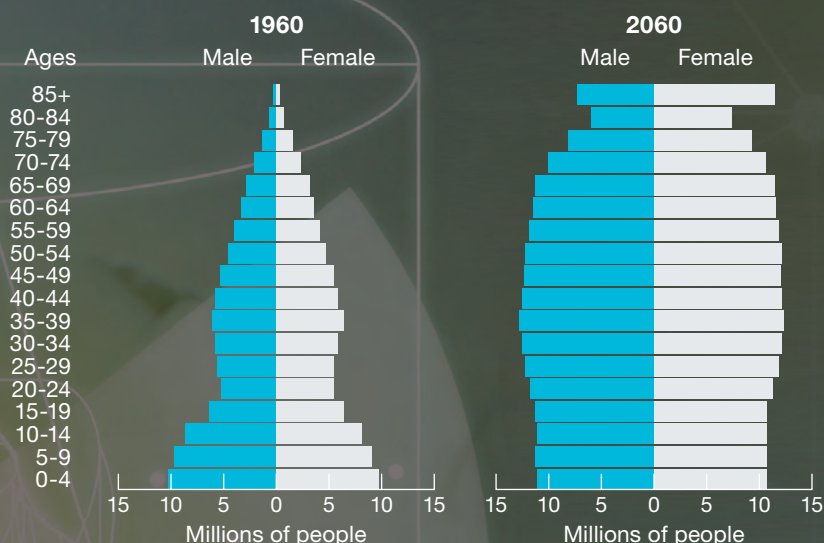
Because healthcare, as more than 80 percent of respondents in our **What the Future** survey will attest, is just too complicated. And that is not leading to better care or better health.

When we all ask ourselves **What the Future** we need to be thinking about all of these realities. We need to think about soaring costs, bifurcation of access, and the demographics of healthcare. We need to be thinking about how today's realities shape tomorrow's healthcare continuum.

We need to be thinking about how we can develop and deliver integrated therapies underpinned by artificial intelligence and connectivity to the patient/caregiver ecosystem that ultimately use technology for better prevention and greater wellness. We also need to be



## The graying of America



(Source: U.S. Census Bureau)

thinking how we can create a better experience in the context of the behavioral influences and environmental factors for those on therapy and those professionals and families alike who do the caregiving. Today's technologies already provide the tip of the spear for greater engagement across all aspects of healthcare. We need to understand the privacy trade-offs that people will make and make those trade-offs worth it.

We interviewed more than 30,000 people around the world, and experts from around the healthcare sphere. We looked at the future through a variety of lenses. What it all comes down to, is this: The future of healthcare needs to be designed with people in mind. If amazing new therapies are developed, but no one uses them because they're difficult to use, or expensive, or time-consuming or stressful, we won't achieve our aspirations for better solutions that improve our overall health and wellness. But if we ask the right questions and drive toward the right answers and test, and learn and iterate — if we do all of that, while keeping the people first and foremost, we can create a future where healthcare feels properly integrated with our daily lives.



**Steve Girling**  
President (North America),  
Ipsos Healthcare

## Editor's note

### Let's talk about caregiving burden, in practice, not in theory.

Twice, the interviews for this issue of **What the Future** were impacted by caregiving issues. In one case, the interview subject pushed the call back a week due to an emergency caregiving trip. Another interview was interrupted by a phone call giving the interviewee updates on an aging parent's medical test results. These are the people leading the charge for better technology-driven caregiving scenarios but they are in the trenches, too.

This is the third issue in our **What the Future** series looking at the big trends in the four largest consumer spending categories. Each report features exclusive new research from Ipsos, including global surveys and deeper dives in the U.S. and Canada; interviews with experts with a wide range of perspectives on the topic; and insights from Ipsos thought leaders.

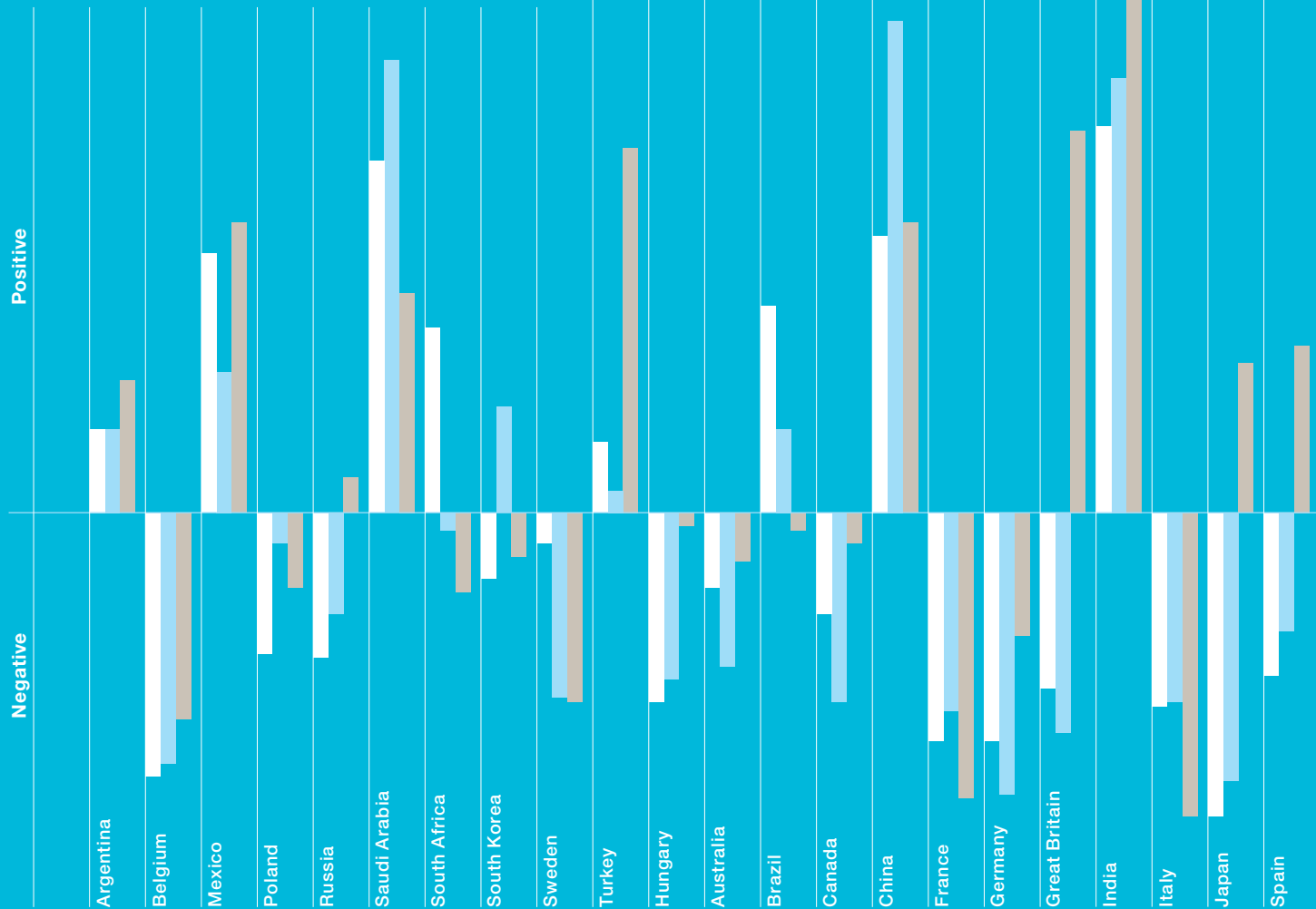
We're all patients and most of us are also caregivers to our kids, or our parents, or siblings and other loved ones. That dual role is going to increase as our society ages. So, when we think **What the Future** of healthcare, we're thinking less about the technology itself and more about its impact on two key groups: patients and caregivers. Because although more effective pharmaceuticals and treatments might enable us to live longer, we also need a healthier, improved quality of life along the way.



**Matt Carmichael** is the editor of *GenPop*, a magazine produced by Ipsos where he serves as the Director of Editorial Strategy in North America.

# Some (not all) nations upbeat about their future health

How do you think the following will change over the next 10 years?  
(Will get much/somewhat better)



WTF-2018

My own health  
 The cost of my and my family's healthcare (doctors, hospitals, medicine, etc.)  
 The availability of treatments for various health conditions

Globally, most have tried or are willing to try **tele-medicine.**

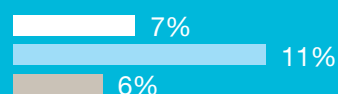


**Which of the following best describes your thoughts on using tele-medicine?**

Tele-medicine allows patients to consult doctors or specialists without having to visit them in person, using video, audio and/or messaging applications on a computer, a tablet or a smartphone.

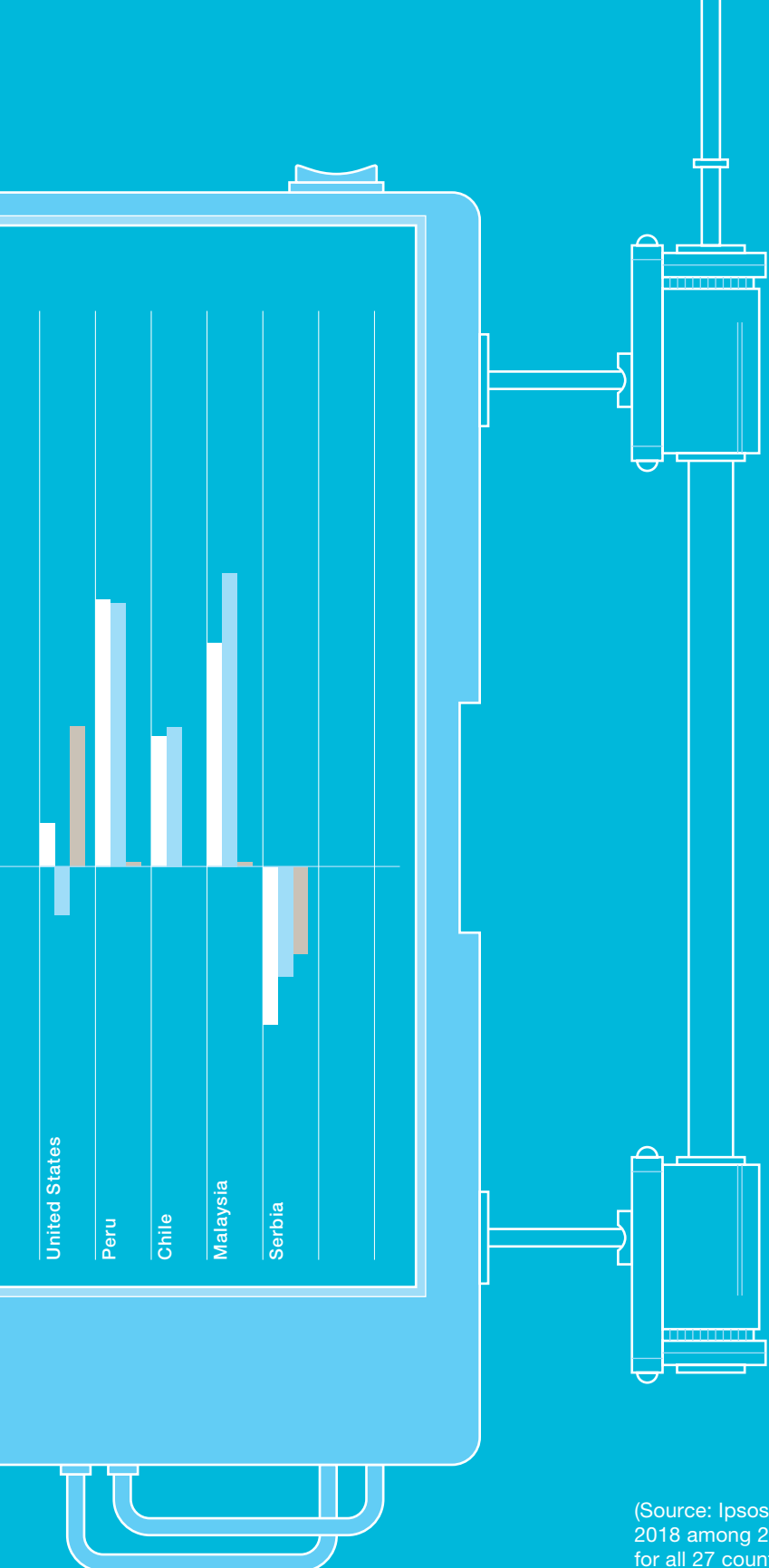
Global
  United States
  Canada

**I have used tele-medicine and I will use it again if I can.**



**I haven't used tele-medicine, but I will try it if I can.**





Traditional sources  
are still the leading  
**trust brokers,**  
but online information is  
catching up.



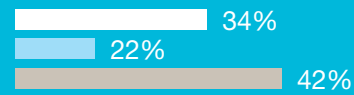
**Which of the following do you use or go to when you need information about healthcare, symptoms of diseases, treatments, etc.?**

Global United States Canada

**Doctor or other healthcare professional**



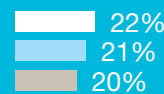
**Pharmacist**



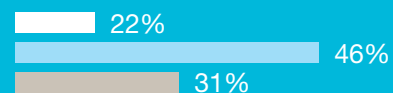
**Online search engines**  
(e.g., Google, Yahoo, Bing)



**Online encyclopedia**  
(e.g., Wikipedia)

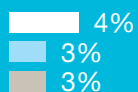


**Medical/health information website/application**  
(e.g., WebMD, Doctissimo)



(Source: Ipsos Global Advisor survey conducted between April 20 and May 4, 2018 among 20,767 adults in 27 nations. For the full dataset including results for all 27 countries, please visit [ipsos.com/en-us](https://www.ipsos.com/en-us))

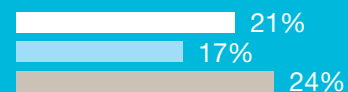
**I have used tele-medicine, but I will not use it again, even if I can.**



**I haven't used tele-medicine and I will not try it, even if I can.**



**Not sure.**







# Question:

Are we prioritizing  
what we need to  
for a healthy future?



**Dr. Sandro Galea**

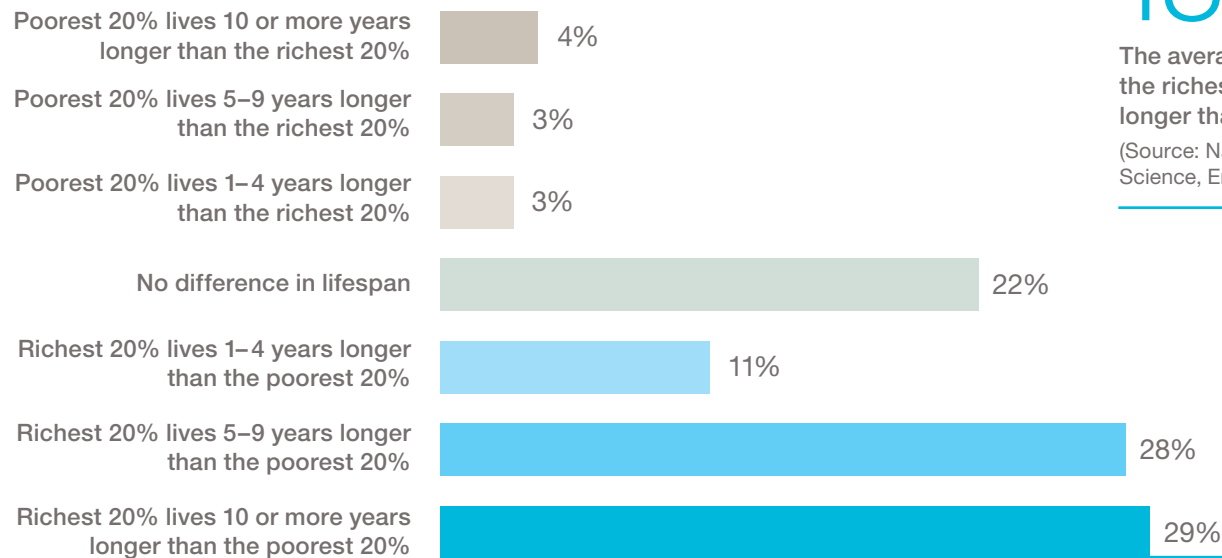
**Physician and dean of  
Boston University's  
Robert A Knox School  
of Public Health**

**As an epidemiologist, Dr. Sandro Galea is always concerned with the aspects of our lives and environments that determine our health as individuals and society.**

When he thinks **What the Future**, he's worried that we're not prioritizing the right things and that we don't understand that the choices we're making affect the policies we put in place. Those policies have huge impacts for equity of healthcare – even larger impacts than we might think.

# Most understand that the rich live longer than the poor, but many underestimate the disparity

How do you think the current lifespan of the richest Americans compares to the lifespan of the poorest Americans?



13 YEARS

The average number of years the richest Americans live longer than the poorest.  
(Source: National Academies of Science, Engineering and Medicine)

(Source: Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)

## GenPop: You asked about life expectancies and how those are different for the richest and poorest Americans. What did you think of the results?

Dr. Sandro Galea: I thought it was clear that most people had the general idea [about the differences] and also clear that only a minority of people actually got the specifics and understood how big the problem is. What struck me is that the narrative about health inequality is out there, yet about a quarter of the people thought there was no difference at all [in life expectancies of the rich and poor]. But I'm an optimist. I think the fact that most people know the difference is good.

## GenPop: And then on the flip side you asked about the factors that relate to our personal health. Despite the set-up question about inequality, income was not seen as a huge factor or at least it was well behind the big three: genetics, what you eat and how much you exercise.

Galea: Personal behavior matters only insofar as the other factors matter – like politics. And those were not understood to matter at all. It's probably a good thing that people do think that these things they can control, like their exercise and their diet (to the extent they control those things), have an impact.

## GenPop: That probably helps us make good decisions.

Galea: In theory it does. The challenge is that it makes us feel like the locus of control is entirely within us, which is actually deeply flawed [thinking]. It reduces everything to a notion of personal responsibility. We asked questions about what percent of people understand the real gap between rich and poor and what percent of people think it's all about personal behavior and genes. If you put those two together you're going to say most people understand there's a gap between rich and poor and most

people think that's either genetic or because the poor don't behave properly. That has real problems for how we think and the implications of how we think.

## GenPop: Ipsos does a lot of research about what we call the Perils of Perception: How what we know today and what we think about the future impacts the policy decisions and the personal decisions we're making today. What decisions could we make if we understood these two issues better?

Galea: If we think it's all about genes, then we are going to invest all our money in trying to find some sort of magic genetic solution that's going to improve our health when in fact we know full well that that has very little to do with the health challenges of our times. If we think it's all about personal behavior, we are going to invest only in ways where we accept that individuals should do what is right for the individual, which means it becomes very easy for us to cast blame on people who are not healthy.

# Most underestimate how public policy and social status affect their health

Please rank the following factors based on how important you think they are to your personal health.

Rank	Your doctor	Your genes	Where you live	What you eat	How much you exercise	National political decisions	Your income/ socioeconomic status	Your parents' health	Your health insurance status
1	5%	30%	4%	27%	9%	3%	7%	8%	6%
2	5	13	8	25	23	1	6	13	6
3	8	17	9	16	18	3	8	13	8
4	9	12	11	10	17	3	11	19	8
5	16	8	18	7	11	3	12	15	11
6	18	6	16	4	8	5	16	10	17
7	18	6	16	4	6	5	18	9	17
8	16	5	12	3	5	12	17	9	19
9	6	3	5	2	3	64	5	4	8

(Source: Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)

## GenPop: What good changes would come if we had a better understanding of the impacts of these personal and political factors?

Galea: We create a world where we do what we need to do to generate health. There are three things that we do. Number one: We need to govern for health. We need to make sure that we make decisions that actually promote health. Number two: We need to make sure that multiple sectors act in a way that generates health. That means to make sure that when decisions are made about transportation or housing or income structure or employment, that we recognize that these have impacts on health. Number three: We need to create a demand for health. I don't mean a demand for "not to be sick." I actually mean a demand for health.

## GenPop: What do you mean by that?

Galea: We need to collectively create a world where we agree we want to be healthy and we should be healthy. That ultimately results in governance for health.

## GenPop: How do we create that demand?

Galea: We create an understanding of what really matters. Once we have that understanding, I have deep confidence in the wisdom of all of us as a collective. Then the question is how do we take that understanding and use it to make sure that all sectors that are important will act for health and that we govern for health.

**GenPop: In some ways this has to become a consumer-driven process rather than a top down, "the government will just fix it for us" process. We are starting to see that in some ways in the food sector. People are demanding healthier options and the market is responding and delivering.**

Galea: That's correct. That's a very good analogy.


## GenPop: And we're seeing that in housing and transportation in some areas too, and we know that where we live and how we move impacts our health.

Galea: There are plenty of examples where we're doing the right thing. We're just doing them in a small scale and particular places. We should do it in bigger scale.

## GenPop: Say we figure this all out and create this demand and start making better choices. What does that future look like?

Galea: It's a future where we see health as the ultimate goal of good governance and where policymaking takes human flourishing and human potential as its ultimate end. Healthy humans should be an inevitable and inextricable part of that. Various sectors across functional domains like transportation or housing must make decisions with a clarity about the health impact of these decisions. There is a popular clamor for a world where you can live healthy, be healthy and your children can be healthier than you.





# Question:

## Can technology make the patient experience more human?



**Zoë Keating**

**Cellist, caregiver  
and patient advocate**

**Three years ago, Zoë Keating lost her husband to an aggressive form of non-smoker lung cancer.**

At the time, she lived in a rural area outside of Santa Rosa, California, and was independently insured. She had to balance her career as a composer and cellist and her dual roles as mother to a young child and spouse to the patient. Jeff Rusch, her husband, needed positive reinforcement to keep up the energy for his fight. Yet privately, she knew the prognosis was dire and unavoidable. Keating educated herself about treatments, searched for specialists, and trekked from one doctor or hospital to another to gather medical records. Of course, she's not the only caregiver who's faced similar challenges. But Keating set herself apart, by blogging about her experience with such detail and passion that her story spread. She would eventually give a TEDMED talk, appear on a healthcare panel with President Barack Obama and participate in Vice President Joe Biden's "cancer moonshot" summit in 2016. When she thinks **What the Future**, she wonders how others might someday have a better experience than she did.

Few find the U.S. healthcare system easy to navigate

**To what extent do you agree with the following statement:**  
The healthcare system in the U.S. is easy to understand and navigate.



(Source: Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)

**GenPop: What were some of the most difficult aspects of being a caregiver?**

Zoë Keating: Finding out what providers are in a network and finding out what the costs were going to be in advance. That and data sharing — having to get all the medical cases to the specialist without having to fill out 10 pages of paperwork every office visit. In the realm of billing, trying to understand why something wasn't covered by the insurer then trying to figure out how to fix it myself. Then [after Jeff died] I moved and the rules changed. I had to relearn a new system and transfer medical records. Also, I travel a lot and it's not always clear if I'm covered if something happens to me in another state.

**GenPop: You've written about how you had to drive discs of medical images between doctors.**

Keating: [My husband] had cancer affecting multiple parts of his body, so there were different specialists dealing with each part of his body, and they didn't seem to have ways to communicate with each other, so when he had an MRI it had to be read by a brain specialist at University of California, San Francisco, which was 75 miles away. And it also had to be read over at University of California, Davis, which was 90 miles in another direction. His type of cancer doubled in size every three weeks, so it was really imperative that it get read immediately.

**GenPop: Caregivers play many roles. You were a spouse and a mom but also a researcher.**

Keating: Over the course of my meandering through the American healthcare system on my own, I learned that there isn't one person who's holding all the information. If you have a serious illness it becomes crucial that somebody is looking at all the data coming in and all the information on things that are happening, and they're looking at the big picture. That ends up being the caregiver most of the time. The fear is that if you aren't paying attention you could miss something because you're not a medical expert.

**GenPop: What other roles did you play?**

Keating: The caregiver as a medical information hub and expeditor. You're the person who is going to make the appointment, the person who's going to call the doctor's office and say, "Did you get the records?" You are the project manager and the project is to protect your loved ones.

**GenPop: In the survey, a large majority of people agree the system is hard to navigate. Your follow-up question was if people would like a person, or eventually perhaps an artificial intelligence system, to help them navigate. Essentially a healthcare porter or navigator. About half said they would, which seems low to me.**

Keating: Before my experience I had no idea that it could be so complicated. I couldn't even imagine the world that we were plunged into. You don't know what you don't know.

**GenPop: It seems like this "navigator" is an idea whose time has come, though. Especially if, as the survey suggests, it was provided by your primary doctor or a nonprofit and then covered by insurance. Your final question hints at yet another caregiver role you played — that of data collector and archivist.**

Keating: I used to be an information architect before I was a full-time musician, so it was natural for me to become the information architect of my husband's cancer treatment. You have a patient who generates information. Where did that information go? They go through treatment. Does anybody learn from what happened to them afterward? And I fear the answer is, "No." Part of it is because the information comes from so many different places.

**GenPop: You collected information about Jeff, such as what he ate and how he felt. There was information from his various doctors. There was information being shared in virtual communities of survivors and people going through the same treatments that Jeff was. It seems if that data were gathered, the system could learn from it, especially as AIs are used more in the healthcare system.**



**“The fear is that if you aren’t paying attention you could miss something because you’re not a medical expert.”**

Keating: You have an oncologist and the data of how things went during the treatment, or if the person survived or didn't survive, or how they did on a particular medication. Does anything get tracked afterward other than death rates and what he died of? I have some doubts as to how progress happens. Does progress have to only happen inside of a medical institution like a teaching hospital with trials? Or can data be collected from the field and fed back into improving both the nature of the care and the experience of the patient?

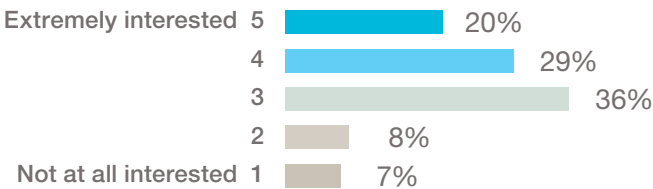
**GenPop: You had the caregiver role of storyteller — both in terms of how you inspired Jeff to keep going, and the stories you shared with others, the fans of your music and the caregiver communities you were part of.**

Keating: The other elephant in the room was that there was never at any point any medical professional who would have prepared me psychologically for what was happening. I had to kind of teach myself. Each patient is different. I'd want to know everything; that's my personality. But my husband would not. Sometimes there's a disparity between what a doctor needs to tell a family and what the patient needs to hear. I don't see that doctors think that they're responsible for that. In retrospect, I could probably have used some counseling at the time.



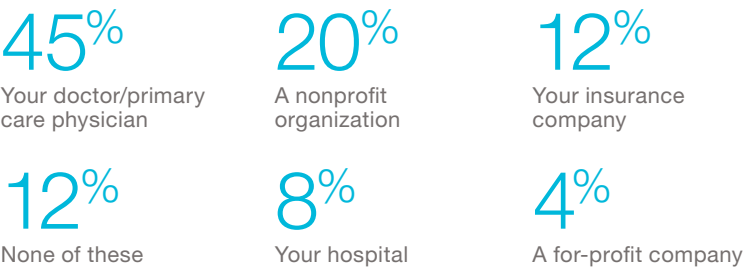
## Most people would be interested in a healthcare navigator

If a service existed that would allow you to receive assistance, either from a person or a computer program, in navigating the healthcare system — from selecting doctors and facilities, to arranging appointments, to ensuring timely patient/caregiver communication, to working with the insurance companies — how interested would you be in that service?



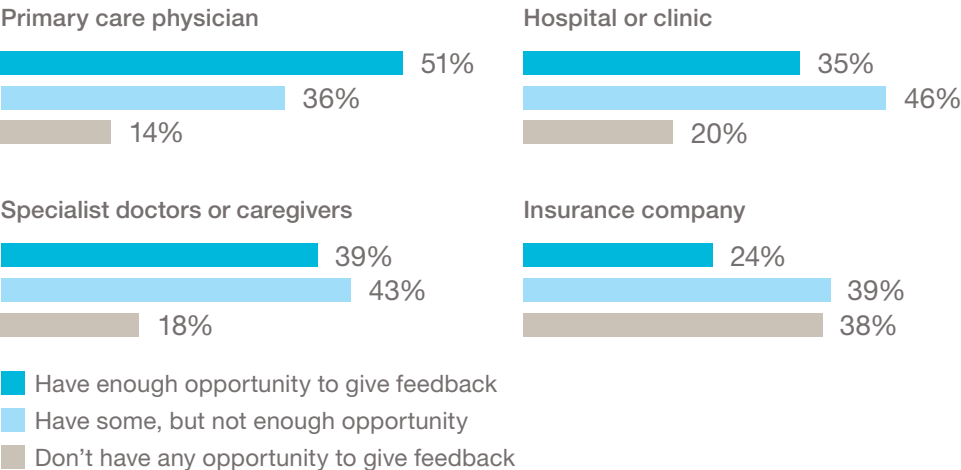
## Doctors and nonprofits would be most trusted to provide a navigator service

If such a service existed, who would you most trust to provide that service?



## Most would like to provide more feedback to the healthcare system

To what extent do you feel like you have opportunity to provide customer feedback to your...



(Source: Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)



# Do people understand hospital ratings?

Zoë Keating asked if patients have ample opportunity to provide feedback to the healthcare system. Her reasons for asking were broad. She was thinking about all of the places where data is collected – in homes, in medical facilities, in chat rooms and online communities – and how to share that back with the healthcare system. And she was thinking of providing feedback from her experiences with care given by his doctors, and the system as a whole, in terms of convenience, cost and communication.

Most hospitals are required to get patient feedback for the U.S. government's Hospital Compare from the Centers for Medicare and Medicaid Services. Rating sites like Yelp also allow people to rate their healthcare experience. But does having that data encourage people to make better choices? The answer, according to research we conducted at Ipsos, is sadly, "No, it doesn't."

The findings illustrate the need to educate patients on how to use the rankings data. For instance, ratings using a five-star scale were easier to understand than those that ranked hospitals as being, for instance, in the "top 10 percent" or "bottom 25 percent." In fact, people who demonstrated low understanding of health data were more likely to choose a hospital listed as being in the bottom 10 percent than in the top 10 percent. In other findings, patients said they trust the feedback data the government collects more than they trust Yelp, but were no more likely to use it when making a selection. With both sources of information, patients' choices tended to be more swayed by negative reviews than positive ones.

This points to a need for better education and explanation of ratings systems so patients have the best data and know how to use it to their advantage when choosing a doctor or hospital system.

*Katie Ziemer is an associate research scientist in Ipsos' Public Affairs practice*

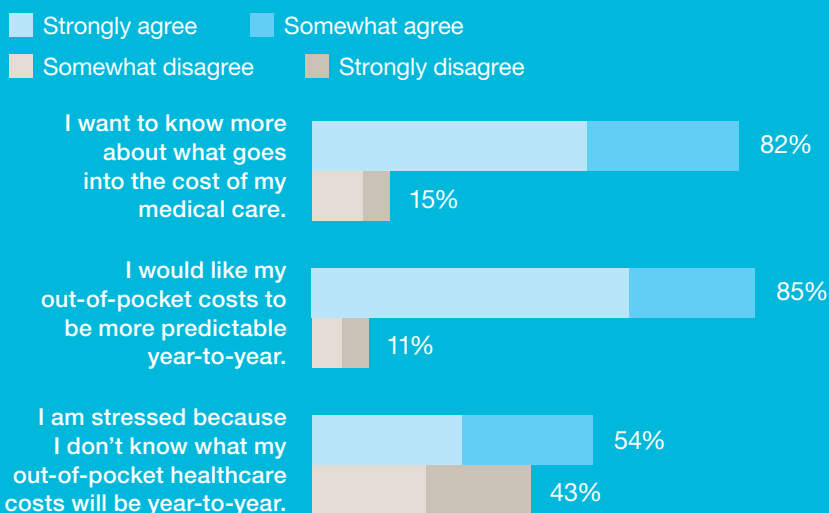
## Today's cost realities shape tomorrow's fears

**In our global healthcare survey, only one in five people said they think the cost of healthcare for their family will get better in the next decade. In the U.S., it's worse, with just one in 10 having hope for lower costs. In Canada, it's one in 20.**

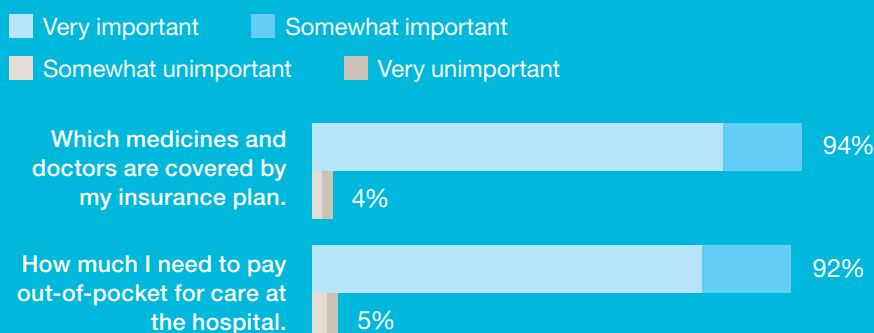
That clearly reflects today's reality. In an Ipsos survey for Consumers for Quality Care, more people said they were concerned about the cost of healthcare than about the costs of housing, higher education, retirement and childcare. Part of the problem is a lack of consistency and transparency about costs in the healthcare system. Another part of the problem is that with so many players impacting costs, there's plenty of blame to spread around.

*Janine Beekman is an associate research scientist in Ipsos' Public Affairs practice*

### Healthcare costs



### Transparency in healthcare



(Source: Ipsos poll conducted March 13-25, 2018 on behalf of Consumers for Quality Care among 1,700 adults interviewed via phone.)



## Question:

Will caregivers embrace the technology they need?




**Arielle Burstein**

**Associate director, Center for the Future of Aging, the Milken Institute**

**For a Millennial, Arielle Burstein spends a lot of time thinking about aging. She works with businesses to understand how demography will change how they design products and services and manage their workforce.**

She sees the nation getting older and knows that will mean more people will be in a role as a caregiver to an older family member or loved one. When she thinks **What the Future**, she hopes technology can ease that burden for the caregivers and the cared-for alike.



**“In my experience, viewing something as both helpful and easy-to-use are the two most critical factors. Designers definitely need to be considering all of the end users.”**

**GenPop: Who is bearing the brunt of the caregiver burden?**

Arielle Burstein: I think women are disproportionately affected. Also, people are surprised to find that many Millennials are caregivers. Currently, one in four family caregivers is a Millennial, and we are more likely to be balancing both work and caregiving duties.

**GenPop: As the Millennials and their Boomer parents get older, they're also more likely to be caring for their children as well as parents and relatives too, right? What are the implications?**

Burstein: There are significant financial impacts on caregivers as well as physical, physiological and social [impacts] because people are spending time caring rather than doing things for themselves. Caregivers have been called “the hidden patients.”

**GenPop: With the shortage of professional caregivers, there's an increasing demand for family caregivers, yes?**

Burstein: There's also a strong desire on the part of families to keep their loved ones either in their own home or living with them so they may decide to undertake this responsibility of caring for them on their own.

**GenPop: And the hope is, of course, that technology can help reduce some of the stress for both sides. Some of these technologies exist already, but we'll see more in coming years.**

Burstein: One thing we've already seen [that has] had great success is ride-sharing/hailing services. When it comes to coordinating someone's healthcare, transportation in particular can be a huge challenge. So to be able to pay a reasonable amount of money to send someone over to a doctor's appointment in the middle of a weekday is kind of incredible.

**GenPop: And as those fleets become more autonomous that will likely increase their utility, especially as people already view these technologies as easy-to-use, according to the survey.**

Burstein: In my experience, viewing something as both helpful and easy-to-use are the two most critical factors. Designers definitely need to be considering all of the end users. I will say that I think people underestimate older adults. But with caregiving technology in particular, you're asking an already busy and possibly overwhelmed population to take a chance and spend a little bit of money on something that may or may not help them.

**GenPop: What does tech-enabled caregiving look like in the future?**

Burstein: Primarily caregivers are coordinating healthcare, so something that allows caregivers to keep track and maintain their health. We know from the National Alliance for Caregiving that what caregivers seek out the most is tech that helps and delivers, tracks, monitors and coordinates. We need something in the Internet of Things family that's feeding physiological data. As a caregiver I need to know my mom took her blood pressure and it was good, or had her meds at lunch.

**GenPop: What else?**

Burstein: Security is another is another big one. I think communication technologies are really critical both to sometimes provide entertainment and keep loved ones in touch with their family – especially if they're at a distance. Obviously transportation is another big one.

**GenPop: What is the less idealized version, where all of these things don't quite work the way we want them to?**

Burstein: The less idealized version isn't relieving the caregiver of any of their responsibilities. The technology isn't providing any respite, or it's difficult to use and it gets abandoned, or it makes the loved one feel old or dependent.

**GenPop: I would think in the idealized world you would have many of these features for your own instead of a completely separate suite of devices and apps.**





# 34.2 MILLION

The number of caregivers who have provided unpaid care to an adult over age 50 in the last 12 months.

(Source: National Alliance for Caregiving and AARP, 2015)

Burstein: I think well-designed things work for everyone. If I get up in the middle of the night and I want to be able to turn the lights on with a voice-automated system [it's great that it] also works for someone in their 80s who is getting up and out of bed. If they're designed well, they work for someone at 20 and someone at 80.

**GenPop: Tech could also be used to connect caregivers in virtual communities for support and advice, too.**

Burstein: We know it's very isolating to be a caregiver not just because of your duties and the time spent caring for someone, but [also because] oftentimes other people don't understand or they're not comfortable being with you and the person you're caring for. So, absolutely, I think that's key.

**GenPop: What is needed to encourage use? The data from the survey shows high levels of receptiveness as these technologies develop.**

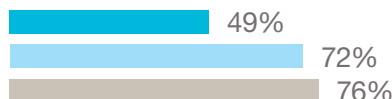
Burstein: There's no shame in having programs for a technology education. I think it will serve caregivers and our aging population to keep up where we can. This is often people's first experience with seeing aging: as a caregiver. In the United States we've chosen to be independent and career-driven but that often means that you're on the other side of the country from your family or the people that you love.

## Interest in technology to make caregiving easier is high

Percent who "strongly agreed" or "agreed" with these statements. Those who reported in an earlier question that they were in "Excellent," "Very good" or "Good" health were asked about caregiving, those who said they were in "Fair" or "Poor" health were asked about receiving care. Everyone was asked the ease-of-use question.

- Helpful for my own care
- Helpful to care for a family member
- Easy-to-use

### Transportation/ride-share services with a driver such as Uber or Lyft



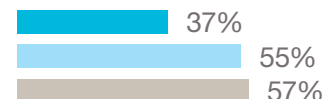
### Home automation features like smart appliances and thermostats that can be monitored and controlled remotely if needed



### Security monitoring services with cameras and sensors



### Self-driving ride-share services when they become available in the next several years



### Devices that monitor physical conditions such as heart rate, blood pressure, blood sugar, etc.



### Communication technologies such as video calling and intelligent voice automation



(Source: Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)

## Question:

# How can Als help you get more time with your human doctor?



**Dr. Joseph Kvedar**

**Vice president, Connected Health Partners HealthCare**

Dr. Joe Kvedar is doing the math and looking at trends. With a long career in connected health, he is eager for artificial intelligence technologies to take hold. Not for the sake of new and shiny things, but because he hopes they can bridge the gap between our growing need for care and the dwindling number of caregivers.

When he thinks about **What the Future**, he's wondering if people will accept AI if it means more time with their doctors and a smoother experience with the healthcare system.

# 83.3

YEARS

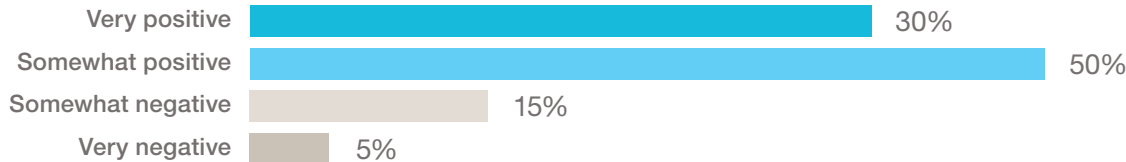
Projected life expectancy for U.S. women in 2030. For men, it's 79.5 putting us toward the bottom of the 35 industrial nations studied.

(Source: Lancet)



# Most would be open to an AI front-end for their health experience

In order to standardize and prioritize the information given to your doctor prior to a visit or consultation, a new system of gathering information from patients is being developed that is based on computer programs. This system would ask you about the primary reason for the visit, along with any symptoms you are having, so the most important information can go to your doctor who can then decide on a treatment or next course of action. What is your view of a computer-based system for gathering information from patients?



(Source: Ipsos survey conducted between May 17 and 21, 2018 among 1,890 adults in the U.S.)

**GenPop: Your question presented a scenario where patients begin their healthcare experience not with a phone menu, or an operator, but an artificial intelligence or computer-assisted system. Why is that important to ask?**

Dr. Joe Kvedar: It's important because of the demographic shifts that are occurring. By 2035, for the first time in history, there will be more people over 65 than under age 5. That demographic shift continues and becomes more pronounced. All of the older folks need more care from the healthcare system, and they need more caregiving from their loved ones. But if we're running out of young people to do that work, we have to think of delivering care in a different way.

**GenPop: The data from our survey shows that people are receptive to a situation where a computer program or AI becomes a front-end for some of their healthcare experience. About eight in 10 Americans say they are open to this idea, and even higher numbers of younger Americans.**

Kvedar: I'm a little surprised and delighted that your survey data turned out to be that optimistic. The healthcare system that we're talking about, using connected health technologies, is designed to make my life as a patient easier while maintaining quality care and outcomes. As long as patients feel like they are being well cared for and can have human interaction with their healthcare provider when and if they need it, there are times in the healthcare delivery process when it is not necessary to interact with a provider at all.

**GenPop: Do you think people will be comfortable having these very personal discussions with a computer?**

Kvedar: The little bit of evidence we have on this is very uplifting in the sense that there are a number of examples of bots or relational agents where it's been demonstrated that people are more forthcoming about topics like sexually transmitted diseases or other potentially embarrassing things when they're dealing with a piece of software.

**GenPop: But the AI can't yet just look at you and see you have a horribly broken arm...**

Kvedar: Certainly in the near term and maybe forever, I don't think every healthcare interaction can be triaged in this way. Most of the value we're talking about is going to be in the area of primary or secondary prevention methods and chronic illness. These technology platforms can be used to identify a health concern, track how an individual is managing their health or help them manage a chronic condition, for example. If I'm having chest pain or I just broke my arm, then I should bypass the technology and go directly to a healthcare provider. We'll have to train these emerging technologies to recognize a more urgent medical need and respond accordingly. So, if I report chest pain, the system should tell me to head straight to the emergency room.

**GenPop: How soon will this happen?**

Kvedar: I'm seeing [a number of start-ups] crop up. Most of them are being billed

as "symptom checkers." So that's not a full suite of experiences, but it's a start. Symptom checkers somehow sounds safe and outside of the mainstream of care, where really the more sophisticated platforms are not just checking symptoms. They're taking a full medical history and making a lot of assumptions about you and your health, and putting you in front of the right healthcare provider. Companies who are getting into this space are not daring to say, "We're coming in with a product that might extend the human being." They're saying, "We're symptom checkers." That seems like a safer way to describe it.

**GenPop: You say "extend the human being." What do you mean by that?**

Kvedar: A very crude analogy is the way a lot of customer support websites are set up now, with tiers or levels of support. You can read FAQs. If you don't understand that, you're instructed to download the user manual. Then there's always a link that says "Chat," and if those chatbots can't solve the problem, your case is escalated and eventually you are put in contact with a person. The ultimate goal is creating a whole suite of technology. Using chatbots and other artificial intelligence, the individual in the call center can interact with maybe 10 or 15 times as many people as they could if they were purely answering phone calls. That's where we have to get to in healthcare, where all the front-end work is done by computers and AI. It frees the healthcare provider, not just to be more human and caring, but also to use their capacity for judgment and emotional intelligence – all of the things that humans do that machines don't.



# Who connects us to connected health?



Millions of people increasingly use digital technologies to track their health, not their diseases. Connected devices monitor their workouts, diets, heart rates and sleep. The subsequent exponential rise of health data is transforming healthcare, much as data and analytics are disrupting most industries.

Healthcare is also shifting — from treating episodes of disease to predicting who is most likely to become (or stay) unwell, as well as offering highly-targeted treatments including context-specific suggestions for behavioral changes. The promise of connected health in this setting is clear: People can use these emerging technologies to collect and analyze context-specific data to better manage their health. One focus area is improving how patients stick to their routines and regimens. This “adherence” problem, which includes things like making sure patients take their medications at the prescribed times, is a nearly \$300 billion problem in the U.S. alone.

It is a key reason physicians are increasingly recommending connected health devices to patients, according to a global survey of nearly 1,700 doctors in 18 countries conducted by Ipsos in 2017.

Those recommendations are critical because healthcare providers hold the position as trusted knowledge brokers and caregivers. To maintain that role, caregivers must embrace and understand the technology their patients and the industry as a whole are moving toward: digital apps, artificial intelligence, machine learning and virtual (or augmented) reality environments that can enhance or replace traditional healthcare practices.

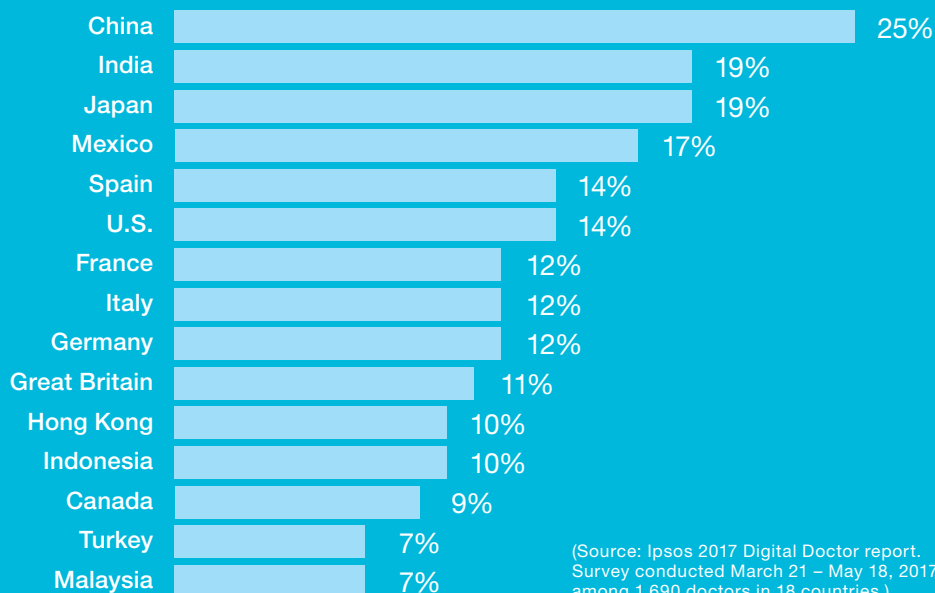
How these connected technologies are adopted is a big, open question for patients, doctors and other aspects of the healthcare industry. Answering it presents a opportunity for industries like biopharmaceuticals, which haven’t traditionally been digital leaders, to adopt more of a startup mentality. Because if they get the design and experience wrong with the patients, the adherence problem will get worse, not better.

The entire health ecosystem is changing and growing as more players are entering from all sides. But at the end of the day, patients need a trusted caregiver, a connected health device, an AI-based analytical tool or likely all of the above to guide them through this shifting landscape.

*Dr. John Rootenberg is a senior vice president with Ipsos Healthcare*

## Only a minority of doctors believe connected healthcare will be short-lived

The usage and presence of connected health devices and tools will be short-lived. On a scale where 1 is completely disagree and 7 is completely agree, the combined percentage for the top two agreement levels is shown.



(Source: Ipsos 2017 Digital Doctor report. Survey conducted March 21 – May 18, 2017 among 1,690 doctors in 18 countries.)

# Question:

# Will people trust AIs when they need to?



**Dr. Kyu Rhee**

**Chief Health Officer, IBM**

You've heard of Watson, IBM's supercomputer that beat out human contestants on "Jeopardy." However, its practical uses are in healthcare. Watson-based systems are already assisting medical professionals as they read information and plot treatment plans.

When Dr. Kyu Rhee asks **What the Future**, he knows artificial intelligence systems like Watson can improve the patient/doctor experience if they'll let it. And he knows that the more we trust these systems with our data, the more the AIs can help. But, he wants to know, are people ready for the tradeoffs?

**GenPop:** Your first question focused on the tradeoffs with privacy. On one hand, we need to be willing to give up a little privacy and let our data be stored in the cloud and read by machines. But if we do, our doctors will spend less time on adminstrivia and can spend more time with patients. They'll also be armed with more information about us as patients, our insurance and the costs of care.

Dr. Kyu Rhee: I'm a little surprised that it was only half of people who want more time with their doctor. From my perception, I don't feel like I have enough time as a doctor with patients. A lot of studies recently have shown that doctors only spend one in three minutes of their day with patients.

**GenPop:** Most people said they also want their doctor to understand the costs of their prescribed treatments.

Rhee: I think most doctors want access to this information as well because they would want to work with the patient. I'll give you a simple example. Say I just diagnosed you with diabetes and I've got a new drug I want you to start on. I'd know what I would normally prescribe for someone like you in terms of what the books tell me or the journals or the guidelines. But I'd like

to personalize it and choose the drug that is a combination of the best evidence but also the best value for you. If there is a drug that I think is something you should take but it's more expensive, I'd like to talk to you about it and include that in my conversation. Now, I don't have access to that information.

**GenPop:** The crux of your question is that eventually AIs can help us remove some of the administrative burden in the medical field so that we do get the tradeoffs that people are looking for. Survey respondents say they trust the doctors to handle that data. They're less trusting of the computers at this point.

Rhee: The key thing is the doctor is the trust broker. The doctor has to trust the machine. And then the patient will trust the doctor. The way we think about how we're leveraging AI – we're not talking about it being directly engaging to the patient. It engages the doctor and the doctor uses and trusts the AI system to help him or her make recommendations with and for a patient.

**GenPop:** You've talked about how the amount of time doctors spend reporting on the visit means they spend much less time with the patient during the visit. How does AI help fix that?

Rhee: Imagine a future where, with the permission of the patient, the computer drafts a note for the doctor, who has to approve it and make sure it's accurately representative of the visit. That'll help the doctor spend more time with that patient. If the doctor is prescribing a drug that isn't covered by the patient's insurance, there should be a little nudge to say, "These are the other choices that are covered." Still, the decisions are between the doctor and the patient.

**GenPop: Your other question related to what you called “data philanthropy.” Essentially, people could donate some or all of their medical data to the cloud to help the medical profession develop better treatments and programs.**

Rhee: Think of data as a natural resource. We live in a world where I can donate my organs when I die. Maybe I'd like to donate my data while I'm alive to help others. Even if I'm healthy, there might be some worth in that to understand why I don't have a chronic disease. What fascinated me about the answers to this question was that there was not much of a distinction between academic, nonprofit researchers and corporate researchers. There was a fairly similar trust level. That's a powerful opportunity for the broad research community.

**GenPop: If people trust corporations with their anonymized data, what does that open up for us in the future?**

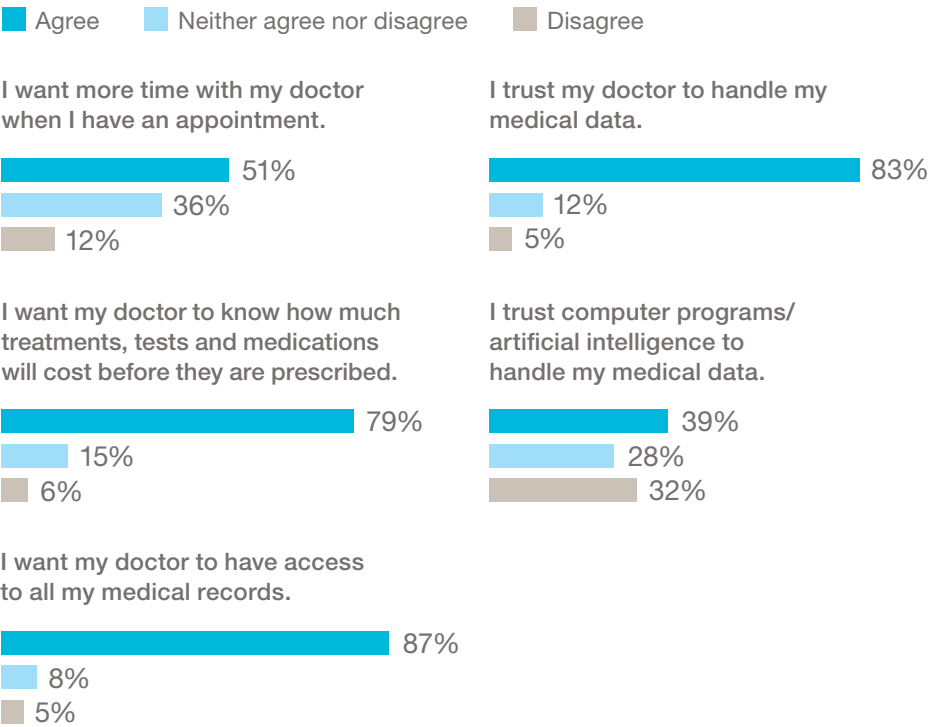
Rhee: If you donate your data we'll find out what trials you're eligible for. This is a big problem we have. If the doctor is the trust broker to getting you to a clinical trial, we could really address a lot of problems we haven't addressed yet.

**GenPop: Say there becomes a lot of privacy regulations about how people can and can't share data, or there is some sort of public backlash against the technology and fear that the algorithms know too much. What does that future look like?**

Rhee: Healthcare is foundationally built on trust. That's part of where the challenge has been in terms of data sharing. We recognize from the determinants of health perspective that all these other datasets play an important role in getting a holistic view of a person or a community to what I call the Four Ps: To better predict, to better personalize, to better prevent and better promote health. If we lose sight of the importance of trust, it's harder to earn trust. It's easier to lose it. We run the risk of missing this amazing opportunity where the technology exists.

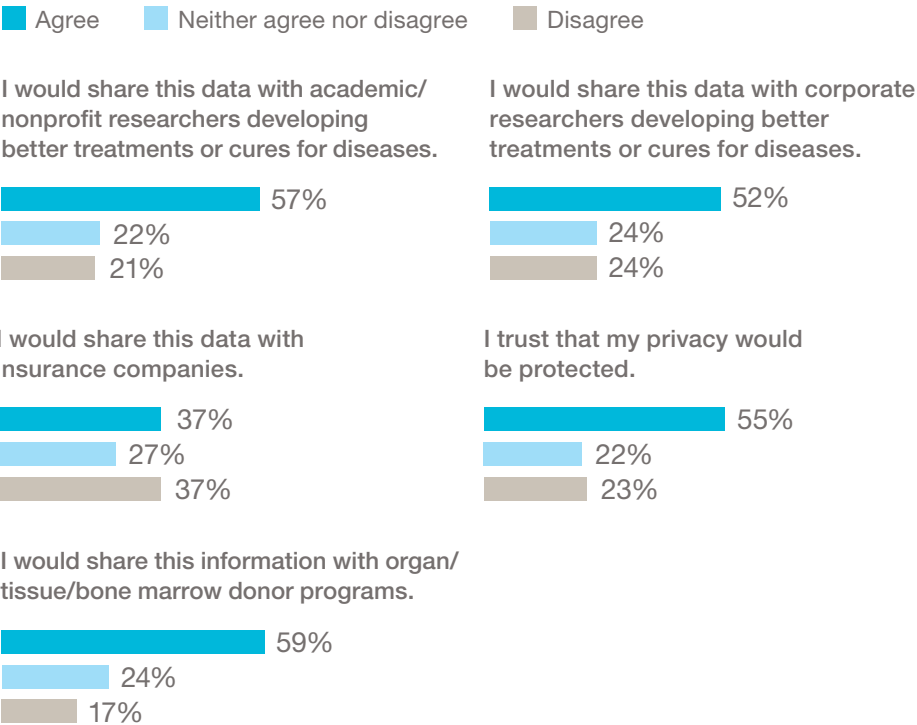
## If doctors act as trust brokers, patients will see the benefits of AI

To what extent do you agree with the following statements:



## Most people are open to the idea of “data philanthropy”

Assuming you could share your personal medical data without your name or other identifiable information, how much do you agree with the following statements:



(Source: Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)



## Question:

Can wearable or ingestible sensors tell us more about being human?



**Anna Kravets**

**Director, business consulting  
for New Jersey-based Merck**

**With our run-trackers, step-counters and smart-watches, bracelets, rings and most of all our phones we are collecting more data about our health than ever. But we're only scratching the surface. When Anna Kravets, director of business consulting for Merck asks *What the Future*, she's wondering how these sensors will change our health and more broadly, our lives, and the world around us.**



**Your question related to the uses people find most helpful with wearable devices. Why was this important to ask?**

Anna Kravets: Real estate or human body is at a premium. On the hand, wrist, and finger real estate is limited but it's also exposed the other people can see it. So using it for something of value as well as the visual attractiveness is very important. After all it affects comfort, image and simply competes with other things you may want to wear there like jewelry or watches.

**GenPop: How will that change?**

Kravets: I believe the trend will be toward miniaturizing and multiplexing sensors while making them more of a seamless experience and more attractive if they are on the exposed areas. If they are for a shorter-term use, like a temperature sensor for a couple of weeks after having surgery, they'll be disposable. Those things will require either minimizing or eliminating the battery. Also improving wearability and waterproofing. If the sensors are integrated with textiles for instance, making them washable, breathable and multi-use.

**GenPop: Will we see more patches?**

Kravets: Yes, there's definitely a lot of work that I see that is focused on patches because some of the measurements you want will be in the areas that are not exposed. For instance, core temperature is best measured at the core.

# Which wearables will win the battle for body space

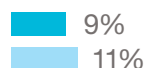
Which of the following possible uses for wearables do you think are MOST useful to you?

■ Total ■ 18-34

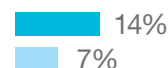
Daily activity tracker (counting steps/distance/exercise levels)



Motion detection (speed/direction/location)



Do not think any of these are useful to me



Heart-rate tracker



Sleep pattern/quality tracker



Medication reminder



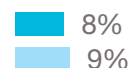
Calorie/intake tracker



Fitness training/coaching



Body temperature monitor



(Source: Ipsos survey conducted between May 17 and 21, 2018 among 1,890 adults in the U.S.)

**GenPop: You say "yet." Will we see more sensors that can deal with fluids? That would save people a lot of time and energy getting lab work done, wouldn't it?**

Kravets: The non-invasive measurement in bio fluids such as interstitial fluids — there is a lot of development happening in that area. That can present very interesting ways of doing lab-type measurements at home and continuously.

**GenPop: Will we be able to monitor different aspects of our health, and in different ways?**

Kravets: For me what's interesting is potential for new ways of enabling correlative and panel-like measurements. For instance, who knows what all we can measure continuously with sweat and interstitial fluid, and what information it can make available about metabolic or immune functions. Imagine if we could also layer in environmental and behavioral data. This would open up opportunity for novel biomarkers that were simply not feasible before.

**GenPop: We'll learn a lot more with all of these sensors, won't we?**

Kravets: Continuous monitoring could help us better understand human health in the real-world setting. Or some aspects of human biology and how they respond to

environmental factors in a way that has not been possible before. If you could have access to that continuously and correlated to behaviors and exposures it can become a platform for innovative ways of supporting human health and wellbeing.

**GenPop: The next step beyond wearable is ingestible sensors, right?**

Kravets: There's a lot of development going on about implantable or ingestible sensors. With a few exceptions, now more of this work is in what I would call a technical feasibility stage: Is it possible? Is it safe? How good are the measurements?

**GenPop: What are the ethical and privacy issues, and are people working on those too?**

Kravets: Not as much as I would like it. Maybe once the technical safety and reliability issues are solved, it will pick up. There are also environmental issues to consider. If those products are not designed and implemented with sustainability in mind we can end up with undesirable consequences like battery-powered ingestible sensors and disposable patches that end up in our trash and sewer system. Back to privacy and ethical issues: Imagine all medications come with an ingestible and you have no choice — your reimbursement is dependent on that. Is it hackable? Would it be possible to know what you're taking? I believe the

industry should spend even more time thinking and discussing those ethical issues — this is a missed opportunity and a risk.

**GenPop: What else can we learn from all these sensors?**

Kraets: If all of these wearables and sensors are implemented and accepted, we'll know more than we ever knew, not just about human biology but also human behavior. This information can be used for a lot of good, such as advancing science, and improving care. But at the same time, it's such personal information and could be misused in the future. As a society we should tread very carefully as we explore those new frontiers.

**GenPop: Can we know too much?**

Kravets: People could become completely dependent on this information, on some algorithms guiding and deciding for them. It has the potential of encroaching on your agency, your ability to know what to do, your individual power to decide and act in the way best suited for your experience, values and ups and downs of life. How do we empower people with technology, but keep it human? How do we make it humane as well? It's important to have some kind of quiet privacy, dignity and control over what you want to do because it just makes you feel good and not being completely shepherded and navigated by data and algorithms.



## Question:

What is the personal value of universal coverage?



**Jon Gruber**

**Professor of Economics,  
Massachusetts Institute  
of Technology**

The Affordable Care Act and the Massachusetts healthcare reform law that laid much of its groundwork under then-governor Mitt Romney both attempted to get more Americans covered by fair and affordable health insurance.

Jon Gruber, a professor in economics at the Massachusetts Institute of Technology, was an adviser for both of those laws. Insurance is still weighing heavily on his mind, as it is on the U.S. economy. He wants more people to realize that all Americans have a stake in universal care.

# 15.5%

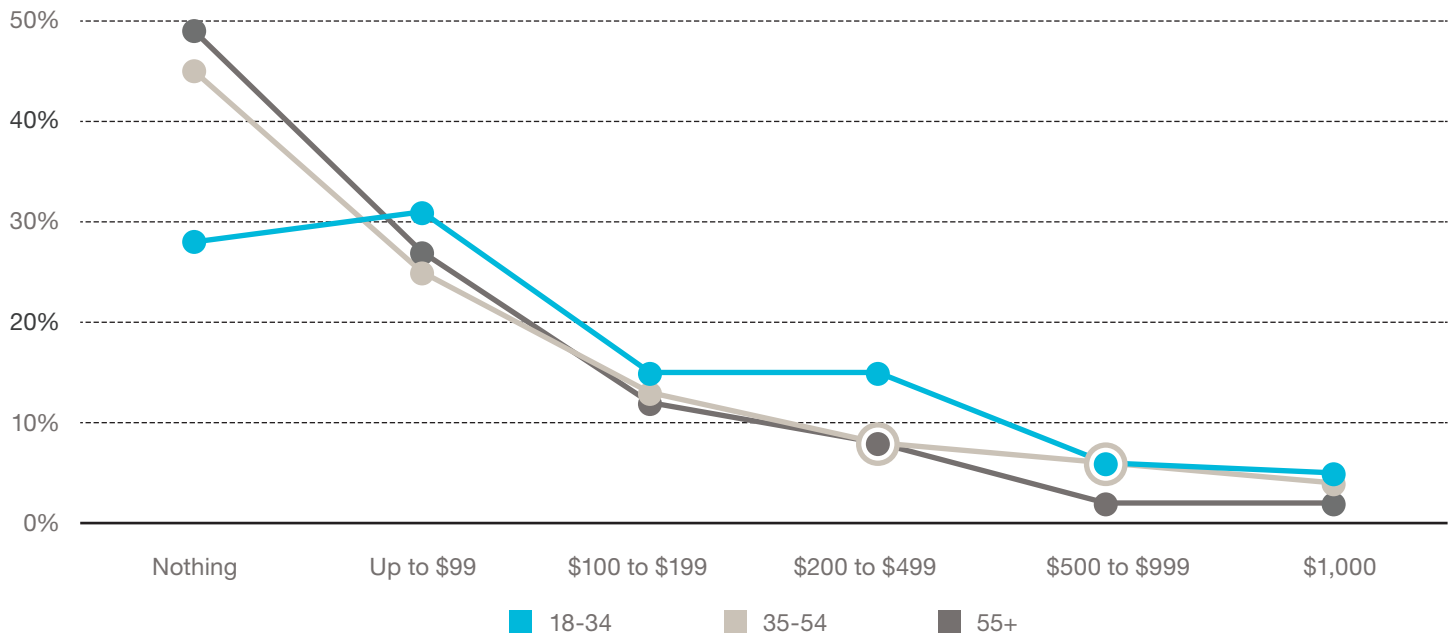
Percentage of American adults without health insurance, up sharply from 2016.

(Source: Commonwealth Fund)



## Few seem to recognize the value in having everyone insured

In order to ensure that everyone in the U.S. is covered by adequate health insurance, how much extra per year would you be willing to pay?



(Source: Ipsos survey conducted between May 17 and 21, 2018 among 1,890 adults in the U.S.)

### GenPop: You asked about the value to an individual for having all Americans insured. Why do you think that is an important question?

Jon Gruber: In the U.S., moving to universal coverage is really a redistribution question. Many Americans don't have the resources to afford health insurance. We find that the bulk of people – not quite a majority but certainly a sizable portion – don't really see that as being something they are willing to personally step up and pay for directly. It was a little distressing how few people really view that it's worth much to them.

### GenPop: We did see that the younger Americans – Millennial age or so – were willing to spend a little more than they do now. They were less likely to say “nothing” and more likely to say “anything between \$100 and \$500.” Is that enough money to cover the cost?

Gruber: We currently have on the order of 30 million to 35 million uninsured Americans. To cover them all right now would probably cost at least \$100 billion a year [about \$1,000 per household].

### GenPop: Regardless of whether I have insurance personally, what is the benefit for me if everyone has insurance?

Gruber: If everyone has insurance, there's a social benefit. You might be happier in a society where people aren't at risk of dying or going bankrupt because they don't have health insurance. Then there's the fact that people who are uninsured will go to the hospital anyway and get care. That's reflected in higher insurance bills for the insured – the so-called uncompensated care problem. There's also the benefit that if everyone in America is insured then, should you become uninsured, you will be protected.

### GenPop: Ipsos and NPR did some research asking people about support of the components of the Affordable Care Act and attitudes about the act itself. Most people support the components, but the support for the ACA split along party lines.

Gruber: Healthcare reform is the kind of thing representative democracy was invented for. Reforming healthcare is

super-complicated – there's no way you could plausibly have a [ballot] initiative on it. The problem is representative democracy has not served the interest of the voters in this topic because it's become politicized. It's not become something where politicians try to understand what's best for their constituents; it's something that's become a political football.

### GenPop: As the divide grows between access to healthcare for those with insurance or without insurance, what kind of future does this set up in terms of the policy decisions we're making and the outcomes for actual Americans?

Gruber: It's a pretty scary future because increasingly we are going to be in a world where it could be harder and harder to get fair health insurance. Think about a world where I know everything about how sick you're going to get from the moment you're born. Why would anyone ever want to insure someone who is born with genes that show they're going to be sick? Increasingly, people will be left out in the cold if they don't have guaranteed fair insurance.

# \$4,612

Amount a typical U.S. household  
spent on healthcare in 2016,  
8% of their total spending

(Source: U.S. Bureau of Labor Statistics)

# 52

 MILLION

Number of adults with  
“pre-existing conditions”

(Source: Henry J Kaiser Family Foundation)

**GenPop: You bring up a good point, that if insurance isn't required and pre-existing conditions aren't covered, all of this DNA testing really does set up a system where people are going to have a hard time getting covered.**

Gruber: In a world where we know everything with genomics, everything is a pre-existing condition. Insurers can just say, “We won't cover a pre-existing condition because you had the gene for that.” Insurance doesn't work anymore.

**GenPop: When we look at the future of healthcare, there are tremendously optimistic and interesting scenarios and tremendously depressing scenarios — often side-by-side.**

Gruber: We are never ever going to solve the healthcare problem. Healthcare in the U.S. is like a chronic disease: You don't solve it, you just manage it. Healthcare around the world is that way. Other countries may spend less, but they're struggling with rising costs as we are. People want there to be one right answer, and there's not.



## A doctor's nudge might be all we need to connect

**With the population of nearly every country getting older, the number of seniors developing serious illnesses such as cancers, cardiovascular diseases, dementia and diabetes is projected to grow. Caring for our senior citizens increasingly will be the responsibility of medical professionals, as well as of family caretakers.**

It's not an easy burden to shoulder, and it can last for years as people live longer with diseases. Caregiving can become a volunteer second – or third – job for adults caring for both their aging parents and their own children. Nursing ill family members deeply affects family life, work productivity, bank balances, and mental and physical health. But Ipsos research shows that digital devices, apps and other technologies can help stave off the burnout and exhaustion that inevitably come with caring for ill family members.

Already, there are myriad technologies to track and manage the health status of patients, as well as of their caregivers. Family members with a medium to high responsibility for care are more likely to use apps, connected medical devices, online support groups and other technologies. Three in four caregivers say these tools save time, improve patient safety and reduce stress.

Some 69 percent of U.S. adults would use connected health devices if a doctor recommended them, according to a 2017 Ipsos Digital Doctor study. Yet only one in five U.S. doctors has adopted these tools.

This gap presents a huge opportunity for doctors to prescribe these digital tools as part of a care plan. Similarly, device manufacturers and app developers could market their products to families, much the way prescription drugmakers have adopted direct-to-consumer advertising. All a caregiver or patient would need to do is “ask their doctor” for more information.

*Laura Clark is a senior research analyst with Ipsos Healthcare*

# Question:

## Will genetics be the lock or key to your privacy?



CeCe Moore

Genetic genealogy consultant and founder of The DNA Detectives

CeCe Moore is a genetic genealogist best known as the consultant for the PBS television series “Finding Your Roots.” Her work is frequently featured on ABC’s “20/20” to reunite people of unknown parentage with their biological relatives.

She recently joined forces with Parabon Nanolabs to provide genetic genealogy forensic services for law enforcement investigating violent criminal cases. When she asks **What the Future**, she’s curious if people are ready and willing to let their DNA be used beyond their own genealogy research.

# 46%

are “very or extremely concerned” about the privacy concerns for “past, present or future” family members who share the same DNA

(Source: Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)



## Many see benefits beyond genealogy for DNA testing

In addition to benefits to you personally, DNA testing services may also offer benefits to society at large. Of the following potential societal benefits of DNA testing, which are you most interested in?

55%

Pharmaceutical drug development for better disease treatments or cures

43%

Identifying perpetrators of crimes

41%

Identifying Jane/John Doe bodies

17%

Marketing consumer products and medicines

24%

I'm not interested in any of these/other

(Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)

28%

say they are "very unlikely" to use a DNA testing service.

(Source: Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)

### GenPop: Your question explored privacy concerns from people using DNA test kits from companies such as 23andMe and Ancestry. What's your reaction to the results?

CeCe Moore: I know there is some concern about genetic privacy but these survey numbers on privacy concerns about people's genetic information are higher than I expected and higher than I have experienced in my work. I was also really surprised by how many people said that they were very unlikely to ever use DNA testing services. It's more than a quarter of respondents.

### GenPop: We expected support for using DNA databases for criminal cases to be lower considering the public debate about the Golden State Killer case.

Moore: I've seen enthusiastic support from the public. That's one of the reasons I decided to go ahead and use my skills to assist law enforcement. I was also encouraged to see that almost half the respondents had positive responses to using data to identify the perpetrators of crimes and Jane and John Doe unidentified bodies.

### GenPop: Could you see a future like in the film "Gattaca," where your DNA becomes someone's main identifier?

Moore: It's hard to know exactly if it adds an extra layer of security or if it will replace our other personal information. For most of us, it wouldn't

matter because no one will care. But if you're Warren Buffett or if something in your genetic profile was used to secure some of your assets, then that could be very interesting.

Or if you were president of the United States and the nuclear codes are unlocked with your genetic profile, that certainly starts becoming interesting, and I can see movie plots around that. I think people will realize if they start going in that direction that it's not all that secure. There's no way to totally secure your body in such a way that you're not leaving DNA anywhere. You're leaving DNA everywhere.

### GenPop: The Golden State Killer case sparked debate over unintentionally implicating family members in crimes. What's your take on that?

Moore: If your great-grandson does something for which he deserves to be convicted of, then maybe that's for the best. But the concerns may go further in that DNA could be used in broader ways than violent crime. If it was used to identify someone

subversive to the present situation, whatever that is, it's not something a lot of us would approve of.

### GenPop: What privacy and legal implications does that create for the future?

Moore: Say with a set of identical twins, one of them tests their DNA and the other one does not want their DNA tested. Who owns that DNA? They both do. But in this society, we have individual choice. So, I don't believe that a lawsuit of that type would be successful in blocking anyone else from testing their DNA. That could hold true for cases between a parent and a child, first cousins and more distant cousins. Unless our entire society's viewpoint on individual versus collective rights changed, I don't see that being useful.

### GenPop: One of today's privacy concerns relates to marketing. What's your take on people's views about letting their genetic code be used in the future for marketing consumer products and medicine?

**"There's no way to totally secure your body in such a way that you're not leaving DNA anywhere. You're leaving DNA everywhere."**

Moore: I was surprised 17 percent were OK with it because that is a consumer interest. Most people see the words “marketing” and “consumer” and certainly can be turned off about having their genetic information used for that purpose. But they’re like, “Fine! OK, tell me I have a genetic risk for something so then try to sell me the drug for it.”

### GenPop: What does that say to you about these people?

Moore: I would think those people are more educated about what genetic information can do. That makes sense in the context that if I have a certain type of breast cancer, I want to know [about] treatments out there for that type of breast cancer. Some people really are worried about their DNA being used against them somehow. But there are still a fair number of people who recognize it could really be used for their personal benefit.

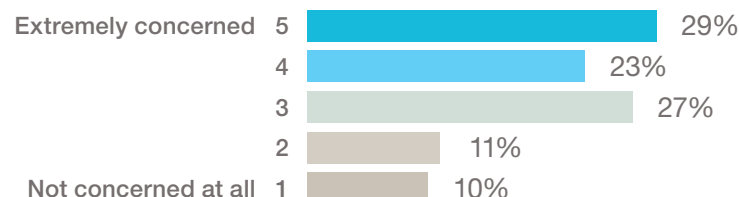
### GenPop: Could you see future governments or other bodies attempt to shut down people's ability to use their genetic code?

Moore: Now with the ability to read the genetic code so easily and so cheaply, I don’t see any way that the government or anyone else would be able to secure that. We’ll likely see some legislation in this area and hopefully it protects our genetic information. California has a state law that gives its residents increased protection based on their genetic information. It was added to the list of things you can’t discriminate for, like gender, race and religion. I would certainly like to see that at a federal level. I think there’s a lot of support for that because that would automatically eliminate the chance of insurance discrimination based on our genetics. I know Sen. Chuck Schumer is spearheading the idea of legislation for having your genetic information shared with third parties, where he wants greater transparency and limitations placed on that. I am not a fan of this specific effort but I think that will happen, and I think this is still so new that everyone’s scrambling to catch up. Whoever is going to be proposing this type of legislation needs to be educated in the field.

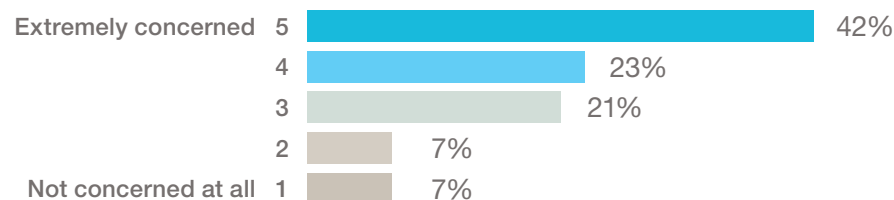
## People are more concerned than not about their privacy with DNA testing

To what extent are you concerned about:

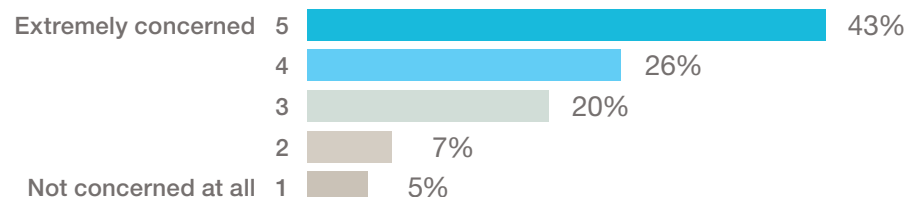
### Companies marketing to you based on your genetics



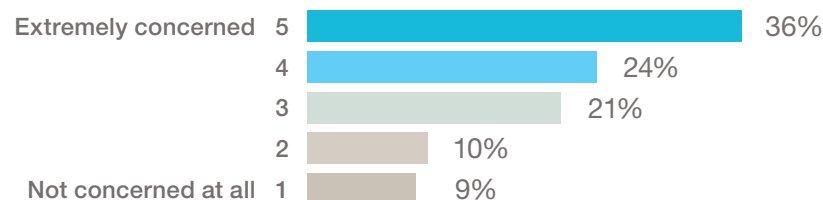
### Insurance determining coverage based on your genetics



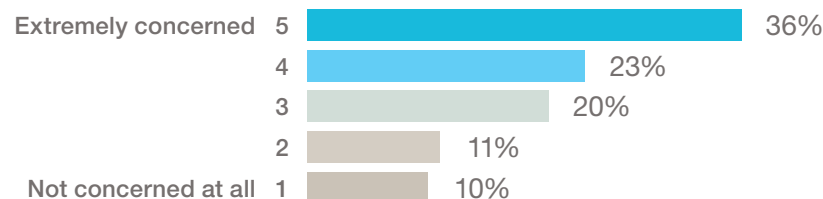
### Identity theft



### Having your genetic information shared with third parties



### Having your genetic information stolen by hackers



(Source: Ipsos survey conducted between June 6 and 8, 2018 among 2,007 adults in the U.S.)



## Question:

# Can behavioral science help us live healthier?



**Dan Ariely**

**James B. Duke Professor  
at Duke University's Fuqua  
School of Business**

Dan Ariely, noted behavioral economist, Duke University professor and author of seminal books such as “Predictably Irrational: The Hidden Forces That Shape Our Decisions,” recently launched an app called Shapa that links a weight scale to a smartphone. The scale has a twist: It doesn’t display your weight when you step on it. Not surprisingly, this is based on behavioral research Shapa’s data show that it’s working to help people shed pounds. How else could behavioral science nudge humans toward healthier lifestyles?

**GenPop: Your question asked about a smartphone that would stop working if the user didn’t behave in a healthy way. Why did you want to ask that?**

Dan Ariely: How do we get people to behave in their long-term best interests? One approach is to make the right behavior more fun – something people refer to as gamification. Another approach is making not doing something more painful. You take away something that people really want, like money. What we know in general is that punishment is often more powerful than the reward. The phone is a really interesting thing because it is both the mechanism for the measurement of the behavior and also the potential punishment of the behavior.

**GenPop: The survey showed that about half of the people surveyed want a phone like that.**

Ariely: In general, we can classify people into sophisticates and naïves. The first person who we call naïve says, “If my phone vibrates when I drive, I will have no problem not looking at it.” With the “type one” sophisticated person they know that there will be a problem if their phone vibrates when they drive. They acknowledge, “There’s a real chance I would look at it and risk myself and other people.” And then the “type two” sophisticated person says, “When my phone



vibrates I will be tempted, and I'm willing to create a cost for myself so that I'm not going to behave badly."

That's really what we tested: What is the percentage of people who are both sophisticated and willing to do something that would limit their future freedom in order to behave better?

**GenPop: People eat cheeseburgers, knowing they are not healthy. Why do we make bad choices?**

Ariely: There are lots of reasons we make bad decisions, chief among them is our emotions. Our emotions get invoked, not based on things that are in our long-term future but based on things that are in the present. We have good ideas about what we want to do in principle, but in the moment, we get tempted. Time after time after time. And as we get tempted we make decisions that are not aligned with our long-term interests.

**GenPop: So we need to better control our emotional attachment to cheeseburgers?**

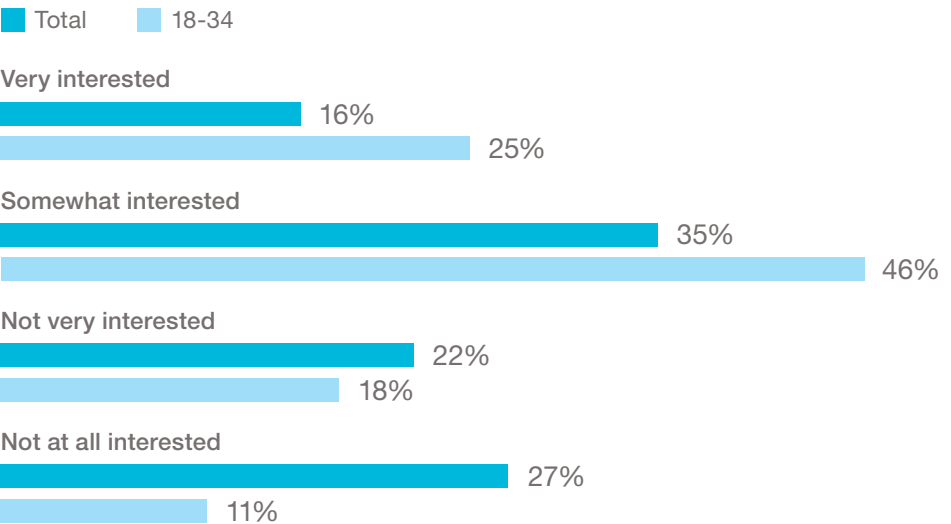
Ariely: The world around us is trying to use our emotions against us. One of the principles in behavioral economics is that we make decisions as a function of the environment we're in. The environment includes every coffee shop and every supermarket and every app and every online store and so on. Now ask yourself, what are the people in your environment interested in? How many of them are interested in your long-term well-being? The answer is almost nobody is interested in your long-term well-being. Our world is tempting us and it's working on temptation and it's getting better at it.

**GenPop: How can behavioral science help us be healthier?**

Ariely: First of all, we need to understand the magnitude of the problem. Because if we are naive, going back to the definition from earlier, and we don't understand that we'll get tempted and fail then we'll just fail. So partially our goal is to help people understand the extent to which we fail. The second thing is to help us create mechanisms to fight temptation. Of course, the first mechanism is just not to be tempted.

People are willing to be punished for non-healthy behavior

Imagine a cell phone that worked only when you ate well, exercised and took your medications on time and stopped working when you didn't follow the actions you are supposed to. This is designed to help you follow your plans for better health by "rewarding" you with access to your phone.



(Source: Ipsos survey conducted between May 17 and 21, 2018 among 1,890 adults in the U.S.)

**GenPop: What else can we do?**

Ariely: Habits are ways for us not to think about each behavior separately but to have a rule that says this is what we do.

**GenPop: Do diets work?**

Ariely: Mostly, diets don't work unless they're accompanied by very strict and very clear rules such as no soft drinks or no desserts.

**GenPop: Do calorie counts on restaurant menus make a difference?**

Ariely: Sadly, almost zero difference. The shocking thing is that despite the evidence that they don't work, people still put them on menus and believe that they will work.

**GenPop: Why is that?**

Ariely: There's a big difference between knowing something and acting on it. And that's true in health and financial decision-making and all around. Calories are really not about revealing new information. And there are very few cases in human history where just learning something and knowing something has actually changed behavior.

**GenPop: Your Shapa scale, which, among other things, does not actually display your weight when you step**

**on it, has some very interesting behavioral science behind it. Why is stepping on a scale in the morning versus the evening helpful?**

Ariely: Stepping on a scale is an activity that reminds you that you want to be healthy. If you do it in the morning you eat a little bit less for breakfast. If you do it at night you just go to sleep and by the morning you forget about the whole thing.

**GenPop: Why does putting healthy snacks at eye level in the fridge or pantry help?**

Ariely: The reality is that the laziness is a very good description of human nature. And I don't mean it in a bad way, but the reality is that we don't stray much from the path of least resistance. We don't look for the difficult ways to do things, we look for the easiest. When you open the refrigerator, what's the first thing you see? It's easiest to get whatever is at eye level.

**GenPop: Do you think in the future that we'll get any better at behaving in a healthy way?**

Ariely: Most likely worse. Imagine you had to run a company and you could appeal to people's logic or their emotions. Which one would you pick?

# Timing is key for brands to help consumers hire **good health habits**

There are many reasons people try to eat healthy. Some people try because they have to, for instance if they have a health issue. Others do so because they “want to” (e.g., they want to feel better in a swimsuit.) Each of these can pose an opportunity for a brand or product to fill that need, if the brand can learn some new habits, too.

Ipsos worked with a client who makes healthy food options to understand when and why someone would choose their brand of products. First, we employed a behavioral science technique called the Job to be Done framework. Think of something a consumer struggles with, like eating healthy, as a “job.” This framework is used to understand why a customer “hires” a product to help with that job.

Using the framework, we categorized the two types of hire – a “big hire” is the moment when people first learn about a product or use something like it. It’s the kind of moment when people are especially open to trying new products. For example, a consumer might have been diagnosed with a health issue that requires a change in lifestyle.

Likewise, there are also smaller moments where products that are “better for you” can serve a specific role. Therefore, a “little hire” is a moment when someone is already familiar with the product category and then realizes it will help them accomplish their need immediately. These “little hires” could occur when someone is thinking about healthy foods as a way to build on momentum from working out into another aspect of healthy living.

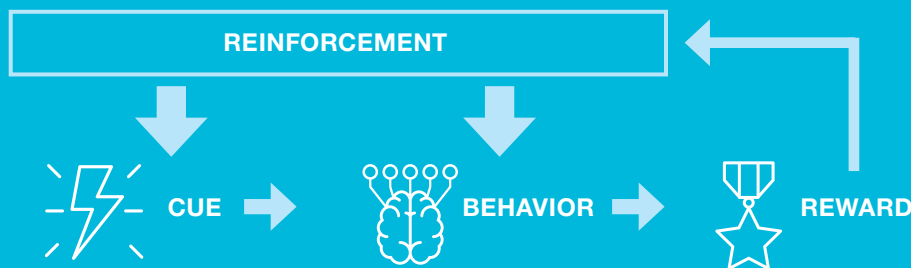
So how does a brand take advantage of understanding when these moments of change are likely to occur, and how do they plan their advertising accordingly?

To answer this, we used the Ipsos Habits Framework. We wanted to understand the goals the consumers were trying to achieve and the disruptive moments when they will consider making “hires” to fulfil those goals. We found that there were certain times of year when people consider their weight and health more explicitly, such as around the start of the year when people are making resolutions or near spring break and summer when people are thinking about “bathing suit weather.” We also explored other moments like fresh starts, psychological changes and locational triggers.

Our client used these recommendations to develop both their advertising and communications planning strategies to reach customers at the moment when they were looking for assistance with both big and small changes to help them eat healthier.

*Namika Sagara is president (North America) Ipsos Behavioral Science Center*

## Ipsos Habits Framework



# Will patients of the future finish their **prescriptions?**

The commentary around the announcement of the Cigna-Express Scripts deal noted that more than 300 different influences impacted a patient's decision to refill a prescription. Unfinished prescriptions, broken diets and incomplete therapies are one of the healthcare industry's biggest challenges. There are incentives for the patient, the pharmaceutical companies, the insurers and doctors to solve the problem.

So how can health professionals keep patients on the path to a healthier life? It comes down to predicting behaviors and personalizing the nudges needed to keep patients on track while maintaining the scale needed to address our growing healthcare needs.

How can all the players in the healthcare industry help keep patients on track, while reducing overall costs — for patients, and pharmaceutical companies alike?

Ipsos created a framework to understand how people stick to their prescription regimens. This adherence begins with the steps of the desired behavior: starting, executing and continuing. It then overlays the barriers that thwart people from keeping on course: motivation, ability, physical context and social context.

One solution is to make the desired behavior into a habit, which bypasses the barrier of motivation. Ipsos defines a habit as a cue that prompts a behavior and generates an immediate reward. Since technology is shaping consumer behavior in other industries could it for health as well?

By applying behavioral techniques, healthcare companies can create a future where people stay healthier, providers save the costs of re-treating lapsed patients, and pharma companies have regular, repeat customers. To get there, the industry will need to fully understand patients, their individual barriers and the rewards that matter to them. By working with pharmaceutical companies and health systems, industry leaders can create custom tools to help patients stay on the track to better health.

*Victoria Guyatt is head of Ethnography (North America), Healthcare*

## Adherence matrix

	 <b>Initiation</b>	 <b>Implementation</b>	 <b>Persistence</b>
<b>PERSONAL</b>	<b>1</b>  <b>Motivation</b> Have read about other people experiencing side effects and feel afraid	Would rather just go to bed than spend time applying medicated creams	Feeling like medication is somehow "toxic" and missing doses is OK because it helps the body "rest"
	<b>2</b>  <b>Ability</b> Don't understand the clinical importance of taking medication	Being unable to open the pill bottle, or not understanding/forgetting instructions for use from healthcare professional	Feeling better after a time so don't understand the need to continue
<b>SITUATIONAL</b>	<b>3</b>  <b>Physical</b> Don't live close to a pharmacy	Working irregular hours so unable to take some doses	Not being able to afford a repeat prescription
	<b>4</b>  <b>Social</b> Social norm/culture of not seeking medical interventions	Not wanting partner or family members to see medication administration	Social norm/culture of not wanting to be "dependent" on medication



# On the Fringe With Amy Webb



**If you want to understand the future of healthcare, it's best to follow many different industries at once. That's because we're on the edge of a great convergence, bridging the internet of things, artificial intelligence, collaborative robotics, genomics and voice-based interfaces. GenPop asked best-selling futurist Amy Webb to give us some ideas of things to watch.**

**1. Nanobot nurses** — Tiny robots capable of delivering medicine to only a specific area of the body, or assisting with microsurgery, are on the horizon. California Institute of Technology scientists developed an autonomous, molecular robot made of a single strand of DNA that treats the inside of the human body like a distribution warehouse. The nanobot can walk around, pick up molecules and deposit them in designated locations. Scientists have been working on nanobot technology for the past decade. Researchers at the University of California San Diego proved that a nanobot, propelled by gas bubbles, successfully delivered medicine inside of a live mouse without causing injury. The hope is that someday soon, nanobots will replace one-size-fits-most medications and therapies, treating our specific ailments without causing side effects.

**2. Custom-crafted microbes** — Synthetic biology is an emerging field that builds new life – replacement organs and soft tissue – as well as entirely new kinds of organisms never before seen on Earth. Synthetic biologists at Ginkgo Bioworks build custom-crafted microbes for their customers, which have included designer bacteria enabling crops to fertilize themselves. Zymergen is developing original microbes for making specialty polymers, which have applications in military equipment and electric vehicles. The University of British Columbia-Okanagan is developing realistic human hearts that can be used for surgical trainees.

**3. Smart thread** — Think of “smart thread” as a sort of temporary, smart system that connects to a smartphone or other medical device and reports on your glucose levels, diagnoses an infection and alerts hospital staff if your body is chemically out of balance. Researchers at Tufts University have embedded nano-scale sensors and electronics into surgical thread that can be used for suturing. Meantime, at the University of California Berkeley's School of Information, researchers are experimenting with smart threads that can change color. These non-surgical threads are coated with thermo-chromic paint that changes color when jolted with electricity.

**4. Biointerface skin laminates** — Ultrathin electrical mesh, pressure-sensitive fabrics, optical sensors and bioacoustic sensing arrays will soon provide a persistent window into your health. Tiny, temporary biointerfaces that include biochemical, light-based and electrical sensors could allow us to use our bodies in entirely new ways. Biointerfaces could someday be used to monitor our vital signs, blood sugar levels or even provide persistent connections between our bodies and the physical world. Researchers at South Korea's Daegu Gyeongbuk Institute of Science and Technology and at the University of Tokyo in Japan are testing ultra-thin, gas-permeable sensors that can be directly laminated onto human skin for long periods of time. This could enable doctors to continuously monitor their patients, or even for patients to monitor themselves.

**5. Biological DVRs** — Yes, you read that correctly. DNA is where we store all of our information, but the problem is that sometimes we humans have temporarily-varying biological signals. Researchers at Columbia University have discovered that it might be possible to record and store information about cells as they age. The technique – a sort of biological DVR – can be recorded by the CRISPR-Cas system over a period of days. In the future, this could allow researchers to very closely study how exactly we age. If we can quantify aging at a cellular level, maybe we can reverse it. And that might be the most promising emerging health-tech trend of all.

*Amy Webb is the founder of the Future Today Institute, a professor at New York University Stern School of Business, and author of “The Signals Are Talking.”*



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