Talking Heads

Willis Towers Watson **ı.ı'ı'ıı.ı**

Episode 6 – Emerging healthcare technology developments

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SPEAKER: You're listening to Talking Heads, a Willis Towers Watson podcast series featuring interviews with senior leaders on the most pressing human capital and benefit-related topics.

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KEVIN NEWMAN: Hello, my name is Kevin Newman. And I lead the health and benefits practice at Willis Towers Watson. In today's podcast, Matthew Griffin, a leading futurist, will share his views on emerging health care trends, and also talk us through health care technology developments over the next ten years. So welcome, Matthew.

MATTHEW GRIFFIN: Thank you, Kevin. So my name is Matthew Griffin. I'm the founder and CEO of the 311 Institute and the World Futures Forum. I'm a futurist and strategic advisor, helping organizations and governments around the world envision and predict the next 50 years. Now, for this particular presentation, we're going to be looking at the next ten years of health and wellness.

So what would happen if I said to you today that there is a very high chance that we can add 30 years to the end of your life. So rather than living to the age of 84, you live to the age of 114, 124, 130. I'm going to show you the technologies that are letting us do that. How would that change how you behave today? Would you recycle more, perhaps?

Now, the biotech and the health care organizations that I talk to around the world believe that in 2028 we are going to reach something called escape velocity. What I mean by that is for every year that you live, new medical advances will add more than a year to your lifespan, hence, the term escape velocity.

Now, we're right in the middle of a pandemic, everybody's noticed. The cost of the pandemic so far has been $40 trillion. 3.7 million people have lost their lives. But emerging technologies have been pushed right to the front of the queue. So artificial intelligence and supercomputers, as well as genomics have helped us cramp vaccine development down from ten years down to three months with human trials being about another six months.

We're actually starting to talk about the technologies that can help us reduce the time that it takes to do human trials. I'll talk about that in a moment. But when you have a look at the impact that emerging technologies have had around the world, we've had 3D printing helping

fix ventilators over in Italy. We've got machine learning, which is now starting to predict the next COVID variants.

We've got bio optical face masks. So these are new type of sensor that when COVID particles land on them, they glow. They're based out of RNA. We've also got biometric diagnosis. I showed this at the Science Museum keynote that I did a couple of years ago with Willis Towers Watson.

This is simply where you can talk into your smartphone. And for example, researchers over on the West Coast of the US basically, will upload your voice pattern. They will have an artificial intelligence analyze it. And then they will give you a score to tell you whether or not you have COVID. Because when you have COVID, your voice box changes.

So in addition to that, COVID is the world's first truly digitized virus. Don't freak out. It's a good thing. We've got drones disinfecting things. We've got robot porters basically running around different hospitals.

And yes, we have the US Pentagon developing biochips that you can insert under a soldier's skin. That chip can tell whether or not that soldier has COVID. And then it simply sends an alert to their phone. So conspiracy theorists, probably going to love that one.

Now, consider this. The cost of the global pandemic so far has been $40 trillion. Two years ago, Canadian scientists used synthetic biology and gene editing tools to recompile the extinct horsepox virus, which has an R rating of about three to four. It's worse than COVID. It cost them $100,000. They used mail order DNA. They showed it to the World Health Organization and a variety of world leaders who kind of went, meh. So the cost of creating the next global pandemic is less than $100,000.

Now, when we look at mental health, one in six people before the pandemic had mental health issues every year. That's increased significantly by about 25% through the pandemic for obvious reasons. So this is where I argue that for both yourselves and your employees, you should-- when we start getting back to normal, focus on you. Give you time off. Take a holiday.

Now, when we start having a look at the development of new psychiatry applications, we've got Calm. We've seen multibillion dollar investments going into different applications. We've got companies like Woebot, who are using conversational artificial intelligence.

You can simply pick up your phone and you text a bot. The bot will text you back saying, how do you feel. You respond. And it will start trying to make you feel better. So this is kind of tele-psychiatry. It's relatively new, but actually it's been supercharged by the pandemic, again, as most things have.

Now, when we have a look at 3D printing, back in the science museum, I talked about how in the future we will be able to 3D print functioning human hearts. Now, when we start having a look at 3D printing, 3D printing and 3D bio-printing really lets us personalize treatments for individuals. So another example of 3D printing is 3D printed medicine.

Not only does this actually eliminate a lot of the supply chain issues the hospitals, for example, have, and surgeries and GPs have. But you can actually 3D print treatments and

medicines based on people's specific behaviors, characteristics, genes, et cetera, et cetera, et cetera, and their own personal treatments. So this kind of gets away from the fact that as a child, you might be taking a medicine that's actually designed for a grown man, et cetera, et cetera.

Now, artificial intelligence, artificial intelligence is the ultimate game changer in health care for lots of different reasons. It's accelerating basic drug development. So we've seen Insilico, who produced 31,000 new drugs basically in 21 days. In addition to that, it's also really supercharging predictive health care.

So this is for example, where we can take a variety of different human models. And I'll show you some in a minute. And we can use artificial intelligence to start saying, for people like you who have these particular conditions, you have ten years left to live. There is actually an Australian AI that actually predicts how long you live based on that kind of data.

Now, in addition to that, at the Science Museum I talked about the fact that this is not a smartphone. This is increasingly a tricorder device. If I use artificial intelligence and I talk in to my phone, not only can I diagnose COVID, but I can diagnose depression, PTSD. I can diagnose dementia, and all kinds of other things, including my predisposition to heart attacks. I can use artificial intelligence and machine vision with the camera. And I can detect whether or not I have skin cancer. If I take a selfie, I can see whether or not I have pancreatic cancer. So artificial intelligence, plus your smartphone, democratizes health care and access to health care in new ways.

Digital twins, so digital twins basically are simply digitized versions of physical things. So for example, like the coronavirus. So we've taken the coronavirus, we've digitized it. Once we've digitized the coronavirus, we can expose it to a whole variety of simulated treatments, and things to see what will have the best opportunity to kill it.

Now, when we start having a look at opioids, we are starting to create digital humans. Now, digital humans I talked about this. This was originally coming out of the US military. It's now starting to actually reach labs and very basic commercialisation.

But by taking things like PET scans, MRI scans, CAT scans, et cetera, et cetera, x-rays, I can start creating a digital version of you. Now, the benefit that that has is say, for example, you need opioids. Some opioids are very sensitive when it comes to the amount that you have to prescribe.

We can actually test for the right dosages on the digital version of yourself. And then when we the right dosage to give, we can give it to you, and we lower the risk that we're going to kill you with the wrong dose. So this is a huge field. There's a huge amount of promise with human based digital twins.

Genomics, we are getting quite close to the point where we can sequence the human genome for $100 using technologies like MinION, which is a gene sequencing tool that is actually being used on the ISS and by NASA. However, in the Science Museum I talked about the ability to use in vivo gene editing technologies like CRISPR to clip out a faulty gene, and clip in the right gene.

So we had a Hunter's patient who was put onto an intravenous drip. Hunter's syndrome basically will kill you in about 20 years in a really nasty way. He no longer has Hunter syndrome.

But since that original presentation, we've seen designer twins born in China who are immune to HIV. We've seen designer twins who are born without their parents and genetic inherited conditions born in the UK and Mexico. So this is now starting to take root. And the regulators are now starting to approve different treatments.

I also talked about cancer vaccines. So there was one cancer vaccine a couple of years ago. We now have three cancer vaccines out of the US and China. And they're proving especially effective for lung cancer, breast cancer, and pancreatic cancer. Nothing yet on brain tumors though, unfortunately, for a variety of different reasons.

When we have looked at immersive reality, one of the biggest problems that we had during lockdown was locking a surgeon in his or her home, because they can't operate. So thanks to organizations like GOSH, UCL, those kinds of organizations, surgeons were given immersive technologies that allowed them to perform operations while they were based at home. They were also able to guide operations from home, and/or from other safe areas within their hospitals.

Now, we've also seen the use of virtual reality accelerate drug development, and we're also seeing the use of immersive technologies letting surgeons especially, do very deep dive, especially into digital people, digital humans, as well as digital diseases and conditions where, for example, a surgeon can start zooming around in virtual reality, and having a look at a cancer in close-up. So they can figure out how best to operate. So immersive technologies are now moving really from the labs, and they're commercializing quite quickly as well.

Quantified self, you are data. Many of you will already know this. So this is simply where we're using a variety of different sensors and different devices to start taking biochemical, biomedical, and biometric information from your bodies. We then pump that basically into the cloud. And artificial intelligence analyzes it all to produce knowledge. And that knowledge is then pushed out to try to encourage people to change their behaviors, or to help give doctors and GPs better information on particular medical conditions for monitoring purposes, and whatever it happens to be.

And then of course, smart pills. We've seen miniaturization of a lot of different technologies that mean we can now swallow a smart pill. It goes down through our bodies. It records a variety of different bio information, sends that to wherever, a local device, a remote device. And again, we can use artificial intelligence to analyze that data, and produce some interesting outcomes.

And then finally, tele-health. Now, when we look at the future of health care, everything is tele-health, it's tele-x. It's tele-operations, which are remote surgeries. It's tele-psychiatry. It's tele-health. It is democratizing, and it makes health care increasingly affordable and accessible to the people who don't necessarily have it. 5G supercharges it though.

So we're all used to having these kinds of doctor consultations now. However, what happens if you have a patient here, and you have a surgeon 500 miles away, that's a bit useless. 5G and different tele-operations technologies close that gap.

So everything that I've shown you here is just the tip of the ice cube. So thank you very much for joining me. Thank you, Kevin. And I wish you all well. Take care. Goodbye.

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SPEAKER: Thank you for listening to this edition of Talking Heads. For more information, visit our insights page on willistowerswatson.com.