



Health in 2040

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00:06–01:18 **Heidi:** Think back twenty years. How did you keep in touch with friends and family? How did you research or look up information or manage your bank account? How did you get around town? Technology has transformed almost every aspect of our lives in the past 20 years and has led to large-scale disruption of many industries. Is the life sciences and health care industry next? This is Tales of Transformation.

We're here live today at Exponential Medicine, where we'll explore how the traditional boundaries of the health care industry are dissolving and how exponential change is accelerating the pace of disruption, propelling the industry toward a dramatically different future—a future defined by radically interoperable data, open secure platforms, and personalized artificial intelligence that enables hyper-engaged and empowered consumers to own their journey of health. Today I have Asif Dhar and Neal Batra, both principals with Deloitte Consulting LLP with me to discuss the impact of disruption on life sciences and health care and the future of health. Welcome.

01:18–01:19 **Neal:** Great to be here.

01:19–01:20 **Asif:** It's great to be here.

01:20–01:40 **Heidi:** Asif, we've heard Deloitte talk here at xMed about how fundamental shifts in innovation tend to occur in seven-year cycles. By the year 2040, a point we can get to later in the show, three of these cycles will have passed—each building off the other exponentially. How does this lead to disruption of an industry?

01:40–02:50 **Asif:** It's a good round number to think about, not only the introduction of a technology, but for society to restructure itself to be able to use it in a very effective way. The thing that's unique about health care is the number of technology disruptions that are happening simultaneously. Artificial intelligence, genomics, virtual reality, augmented reality, nanotechnology, robotics, drones—what happens when you have 14 of them hitting simultaneously? Unlike linear technology, it tends to have a law of diminishing returns. You can keep putting money into a certain process and you'll get gains, but after a certain point you get a low diminishing return, and a lot of our processes that

we think about in society right now are very much like making things in a factory, getting our processes nailed, taking a lot of waste out. The thing about an exponential technology is that performance grows exponentially: one become two becomes four. That doesn't sound so different from one two three, but then when you hit 8 and 16 and then all of a sudden they explode, and once you have them together in smart effective ways and people adopting them and redoing the way they do work, that's when you have social disruption at scale.

02:50–03:08 **Neal:** So what is special about health care? And is it open to the pressures that face every industry? And I think the view that you and I both have, is when the data connects the power to consumers and all of these technologies and sensors converge, you're going to have a disruptive moment.

03:08–03:23 **Asif:** Health knowledge used to increase and double over a certain period. We're getting to a doubling every 80 days. Can you imagine the entire body of knowledge of health doubles in such a short period of time? What's the plausibility anyone can keep up with that?

03:23–03:23 **Neal:** None.

03:23–03:33 **Heidi:** Are we talking about the next innovation cycle? Or is it that these cycles are exponentially changing, that we're using wrong language?

03:33–04:50 **Asif:** What you have to think about are tsunamis and earthquakes. The earthquake is the disruption—disruptions that are happening right now in health care. The personalized medicine revolution is powered by genomics. The shared economy revolution is powered by a whole host of tools and networks. Interestingly, these aren't little linear jumps where you can look at yesterday and you see the increase, see that's exactly what happens tomorrow. That's an absolute mistake to do in this world, because you have to understand you'll have a doubling or tripling or whatever the factor of exponential growth is. What you need to be able to do is to prognosticate the likelihood of that disruption and because they behave a little bit like earthquakes, you do get tsunamis. The shocking growth of information available, the ability to create knowledge and actionable insights is exploding tools to deal with it in the form of cognitive computing and artificial intelligence, and you have a real opportunity to either be able to surf that tsunami wave or be crushed by it. So you create two paths: one, you can think about the future and plan for it, and the other is risk being obsolete. So the question ends up being, what's going to happen in health and medicine?

04:50–05:41 **Neal:** Ten years ago the conversation was how do I get more data? Now it's I have so much data, how do I make sense of it? The next 10 years, it's going to be how do I connect these and draw insight? So I don't think this is an accidental progression. You've seen it coming. We know it's coming. So I think as we think about these cycles of innovation, the next seven I think we're directional. It's going to be the interoperable data, the insights that emerge from it, the sensors that give me even richer data, maybe more real-time, the algorithms, the AI that led to a lot of this becoming automated and not human dependent, but what's really interesting, and this is his exponential point, the third seven years? 2040, who knows? That's where it gets really interesting because it's not linear, it's exponential and it's unexpected, and this is going to be where the pressures as it converges, the next two cycles really come to bear on the third, and that's where the exciting things are going to happen.

05:41–05:46 **Heidi:** Radical interoperability, how radical is radical?

05:46–06:28 **Neal:** Interoperability today in terms of data is linking my wearable telling me how many steps I took with my sleep patterns and connecting that with other data, maybe heart monitor plus something, and we're trying to say what does this mean for me from a health perspective? That's interoperable data. Radical interoperability is the convergence of data sets across a whole continuum: individual genome, gut biology, mental health emotional status, right? Link those up and tell me what it means. Now link that with population health, what's going on in my community, and link that by environmental factors: heat index, pollen count, other dynamics, and put all of that together and now give me the answer in real time. If you want to call that radical, but that's, that's the thing.

06:29–06:38 **Heidi:** I want to bring the person into the conversation of data. So let's talk about this fundamental shift on wellbeing. What do you think the impact of this will have on the industry?

06:38–07:41 **Asif:** A lot of data doesn't mean complexity. It's only complex when you don't have the tools to understand it and the tools to change your process in life. People respond very well once they have the power to understand the data at hand. My brain has, like your brain, has a hundred billion neurons. Those neurons are constantly being programmed with sensory input and they create programs for decades. Then we go to a doctor and say hey doctor, make me stop eating snacks and other foods that are terrible for me. What likelihood would that single program have against 40 some-odd years of programming for all those neurons firing? With AI and huge data sets starting

to understand the way my brain processes information, I might be able to have a fight back. People think we'll become less human but, how human are we when we're subjected to a biological computer that says "Go," that we have to follow, and ends up getting people doing unhealthy things. We might have a chance to fight back.

07:42–07:54 **Heidi:** So thinking about this seven-year innovation cycle and the introduction of 2040. Should we be talking about near term rather than this future future? Should we be talking about the five- or maybe the three-year cycle?

07:54–08:47 **Neal:** As I speak with my clients—health insurance plans, biopharmas, hospital systems—make meaningfully large commitment-type investments, you better believe there's an expectation that there's an ROI still coming off those investments in 2040. And the fact that we're now in front of disease because sensors detect anomalies I can intervene with AI in precise ways that prevent disease from advancing, all of a sudden disease complexity, disease volume declines. So if you're a health insurance company, dependent on a business that's volume oriented, well, oh-oh that's a problem. I think the 2040 lens has allowed us to arrive at interesting insights around how this industry is going to deconstruct and reconstruct given the data and the technology available. So what we found is our clients are very receptive to a 2040 frame because it actually shines a really bright light on where opportunity and risk lie with investments they're making right now.

08:47–09:14 **Asif:** If you can set a vision far out and then walk back two cycles, you know what your destination is going to be in your near term. You'll know what incremental innovation you're going to have to put in place, what invention you'll have to think about, and what radical innovation you'll have to think through—in order to be able to make smart steps when thinking about what might the world look like in the future.

09:14–09:35 **Heidi:** Asif, Neal, you're describing a world with radically interoperable data that will fundamentally transform the structure of the underlying industry and the roles that organizations will need to consider to be sustainably successful. I want to thank my guests Asif Dhar and Neal Batra for joining me on Tales of Transformation. Thank you.

09:35–09:36 **Asif and Neal:** Thank you.

09:37–09:44 **Heidi:** Stay with us as we continue this exploration of the trends driving and defining the future of health. Thank you.

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