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PERSPECTIVE: PART I

CAN WE AFFORD PRECISION MEDICINE?

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Note: This essay was adapted from remarks delivered at a panel on the "Future of Medicine" at my 25th college reunion on May 26, 2018. Most of the panelists discussed technological advances that they envisioned, with a focus on *precision medicine* (an emerging approach to medicine that proposes to customize the selection of treatment for patients in part based on genetic variability).

I'd like to contribute to this discussion by talking about healthcare costs. I'd like to start with the intentionally provocative assertion that we can't afford precision medicine. We as a country can't afford it, so we shouldn't pursue it. I say this not because I really mean it, but because it so striking that we never say things like that. Can we afford it? How do we figure out what we can "afford?"

When I was in college, I majored in psychology, fascinated by the concepts of motivation and behavior. Why do people do what they do? What are the incentives that influence them?

I graduated from college in 1993 and went straight to medical school, which meant that I was a first-year medical student at the time that the Clinton health plan was being debated. I took an elective in health insurance my first semester of medical school, which was taught by Dr. Rashi Fein, a professor who was in Washington, DC in the 1960s when Medicare and Medicaid were created. I was absolutely captivated by this course. I thought, here was a social system, health insurance, that was profoundly influencing the way patients behave and the way providers behave. And we weren't being taught in medical school how those forces would affect our practice of medicine or what to do about them. I tried to engage my classmates in discussions about health insurance. I would say something like, "Hey, guys, let's talk about health insurance." My classmates would say, "Lisa, we're studying H2 receptors." And I would say, "Health insurance." "H2 receptors." I didn't get far.

I have since done a residency in internal medicine and a fellowship in research methods and healthcare policy called the Robert Wood Johnson Clinical Scholars Program. I am now an associate professor at Weill Cornell Medicine, where I do research on how to improve healthcare delivery and how to measure those improvements. I also teach medical students, residents, fellows and faculty. My favorite class to teach right now is for second-year medical students. I teach a series of lectures on healthcare policy, and I basically try to answer the questions: "How did we get here? Why is healthcare such a mess?"

As I have taught this class, I have tried to emphasize just how much our healthcare system today is a function of choices that we as a society have made in the past. So, allow me to take you on a whirlwind tour through the history of healthcare financing to see if that helps us answer the question of whether we can afford precision medicine or not.

Prior to 1870, doctors made house calls with their little black bags.[1] Patients paid their doctors directly, or gave them something for their effort—perhaps a chicken or a loaf of bread. There were no intermediaries.

Hospitals developed in late 1800s only when we as a scientific community figured out that it was a bad idea to operate on someone in his or her home.[1] We figured out sterile technique and then—all of a sudden—we needed expensive equipment and specialized staff, but we didn't need those things all the time. Physicians were self-employed, and most of our patients were still at home. But physicians needed operating rooms, and hospitals needed patients. So they agreed to share. Physicians were given "admitting privileges" to bring their patients to the hospital and use the hospitals' facilities when needed.[2] The patients then paid the physician and the hospital separately. No money changed hands between the physician and the hospital. The physician and the hospital were each autonomous, dependent on each other but separate.

Health insurance didn't develop until the 1940s, in the context of World War II. During that war, many men of working age were overseas fighting, and the U.S. govern-

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ment froze wages at home, so that any extra money could be put toward the war effort.[3] This led to fierce competition among employers for the scarce employees (including women) that were still in the United States. Health insurance began as a benefit that allowed employers to compete for scarce workers without raising wages.[3] Health insurance developed in a way that allowed patients to contribute funds to an insurance pool, employers contributed funds, and the insurance company paid the physicians and the hospital separately. Sound familiar? That is the same financing structure we have today. This is important, because the way health insurance developed in WWII was an artifact of history, not a national strategy for how to structure health care for the country for decades to come. Health insurance may be good (and I believe it is), but it also somewhat unintentionally made healthcare costs invisible. No one could tell anymore how much healthcare costs. No more chickens or loaves of bread.

Now fast forward to the 1980s, when I was in elementary school. The United States at that time spent about 8% of the economy or gross domestic product (GDP) on health care.[4] By 2014, that had increased to more than 16%, and it's still rising.[4] So the percentage of the economy spent on healthcare has more than doubled in my lifetime.

Now, most people can't feel the difference between 8% GDP and 16% GDP in their daily lives. But I did. My family and I live in New York State, and in 2011, Governor Andrew Cuomo signed a law capping property taxes, allowing them to increase by no more than 2% per year.[5] That's not necessarily a bad idea. Force people to live within a budget. Except that perhaps it had unintended consequences. In 2012, my husband and I were at a meeting of our local school district when they announced that they would be cutting art teachers from the district. Why? Because the amount that the schools had to spend on healthcare for their teachers was going up, and they could no longer increase the school's budget, so they had to cut somewhere. The art teachers had to go. Wait, what? The United States can't manage to control healthcare costs, so my kids lose art instruction? Yup. The economy doesn't keep growing indefinitely. When we spend more on healthcare, we encroach on funds needed to support other parts of the economy.

My students and I have found more than 20 reasons why healthcare costs so much in the United States. The role of insurance and the lack of price transparency are parts in a much larger story. But we don't have a national budget for healthcare, and no one is incentivized to help the costs come down.

So, can we afford precision medicine? Precision medicine is supposed to be individualized medicine, customized medicine. And you can be sure that anything custom is more expensive than anything standard. I don't know if we can afford precision medicine. But I'm thinking that the music teachers will be the next to go.

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