Kaiser Permanente’s CMO: How AI Might Help Clinicians Address Patients’ Social Risk Factors

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This conversation is part of a series of interviews in which JAMA Editor in Chief Kirsten Bibbins-Domingo, PhD, MD, MAS, and expert guests explore issues surrounding the rapidly evolving intersection of artificial intelligence (AI) and medicine.

AI may be on the way to developing an enviable bedside manner. It can aid in early sepsis detection and has been viewed as more empathetic than physicians. But what about some of the fundamental factors that affect health, such as stable housing and access to nutritious food? Efforts are underway to use AI tools to help clinicians learn more about the social risk factors that affect their patients’ health.

Andrew Bindman, MD (Video), recently spoke with JAMA Editor in Chief Kirsten Bibbins-Domingo, PhD, MD, MAS, about this and other aspects of AI in health care.

As a general internist and executive vice president and chief medical officer (CMO) for Kaiser Permanente, Bindman has a distinct perspective on the challenges and opportunities of AI within a large health care organization.

The following is an edited version of their conversation.

DR BIBBINS-DOMINGO: What I think about with Kaiser is using the data to continue to improve care for individuals as well as for the population. We have the ability to think about using data at scales we’ve not really imagined before, but you all have probably been thinking about this for a while.

DR BINDMAN: One of the really powerful examples is how we use information collected in our hospital settings—where we integrate information on vital signs, neurologic checks, updates to lab results—in a tool to start to predict which patients are most likely to be headed toward a decline that could result in them having to transfer to an ICU (intensive care unit) setting.

The AI tool is able to do this in a rapid fashion and send an alert to the primary physician involved with that patient to say, “Hey, there’s a pattern emerging here that you may not have seen on your own. You might want to go back and look into that.” We implement these tools in a learning context. And what we have found is that we are in fact better with these tools at predicting who is heading to a decline and might head to the ICU and have a worse outcome.

Another example would be our ability to better identify patients coming to an emergency department to figure out, based on written natural language notes, when that patient perhaps had visited an urgent care or saw their primary care physician initially expressing some current concerns about a symptom or some signs. We’ve been able to use AI tools to capture that information and to help the emergency physician better predict who might be at higher risk of having sepsis so that they’re identified earlier.

And then finally, one other really interesting example is thinking about social risk factors. We’ve been using AI tools to look at things like missed appointments, missed picking up of medications that were prescribed, and saying, “Huh, I wonder if patients who are showing some of these behaviors are actually signaling to us other challenges that they’re having with, say, transportation or other things going on in their complex lives.”

So the AI tool identifies these kinds of gaps or people who might be slipping through our system and alerts the primary physician to say, “This might be a good patient to reach out to, to identify if they’re having certain challenges related to social risk factors,” and then making an intervention. So these are ways that we’re trying to use and develop these tools and learn about them to improve the health of our patients.

DR BIBBINS-DOMINGO: Let’s talk a little bit more about the gritty stuff. You and I are both general internists, and we know that these tools that are supposed to make our lives easier are the things that we oftentimes like to click and avoid and say, “Okay, stop telling me—I know what I’m doing.” So how do you know these tools are really working and what guards against thinking they’re supposed to make our lives easier as doctors, but it’s really making it harder and we start to ignore them?

DR BINDMAN: That’s a great point, and we do have to be sensitive to that kind of alarm fatigue. It’s critical that part of our evaluation of these tools really does take into consideration both what they do to improve our patients’ health but also the experience of our clinicians in terms of using them.
It’s still important to pair the use of these predictive tools with a clinician who is still actively involved in providing oversight. We haven’t turned over responsibility of care to machines or AI decision-making. It’s all done partnered with our clinicians. I think these tools can enhance predictive powers that our clinicians recognize are greater than what they can sometimes see on their own. When we’re predicting who’s likely to go into the ICU from our hospital wards, I think our physicians recognize that this is really a great adjunct.

But in the primary care practice, I think there’s also going to be this important trade-off where these tools can start to not only add predictive power but also take away work from some of our clinicians. We are experimenting, for example, with the use of these tools to essentially be a quiet listener in the room and to generate notes related to the interaction between a primary care physician and a patient and to create an excellent first draft for our clinicians to then review and to more quickly do the documentation component of their work rather than sitting at a keyboard and glancing occasionally at the patient. This allows for more full attention that the patient deserves.

**DR BIBBINS-DOMINGO:** I know equity has been an important issue for you, and with new technologies there are several ways in which equity experts have raised concerns. There’s been very nice work showing that when you learn from patterns of care that are not equitable, you end up reproducing that, and potentially even amplifying that, because of the ability of AI to scale. How do you guard against that?

**DR BINDMAN:** This is such an important issue. And we all need to really home in on it and learn together how to do it. So step number one, I think, is making sure that we have broad representation in the development of these tools. We are of course very sensitive and want to respect any patients, any members, that say, “Please don’t include my data.”

Many patients are extremely interested in having what has gone on with their care to be part of not only informing their future care but also helping others. There’s tremendous altruism among our members for that. So I think we have to make sure we have a good communication loop back to our members—anyone who’s giving us this data—to help them see how their information was helpful. We should make them feel like a participant in the process and be really mindful of getting a very broad cross-section of membership.

This is a critical part of what I think is the first step. The second thing is what you’ve said, which is if there has been bias in the care that’s been provided, we need to identify that and to look at how these tools could potentially exacerbate or lead to further examples of that. But I think that what you’re putting your finger on is something where we all as a community have a lot to learn—to identify our unconscious bias and ways that it has trickled into the health care delivery system and develop what I would think are really good ways of testing these models to look at those kinds of potential issues that that may arise.

I’m a part of a group with the National Academy of Medicine (NAM) where we’re trying to develop an AI Code of Conduct. And this issue has surfaced right away as something that we want to be mindful of. Not only what these tools are trained on and what the characteristics of the individuals are but also how do we do post-implementation surveillance to make sure that we are not introducing these problems? I think there is a lot for us to learn about how to get better at examining our own data, both on the front end as we adopt these tools but also once we implement them. What would be the signs to us that things are going on a track that we don’t want? We are trying to drive toward equitable outcomes and by focusing on those outcomes we can hopefully eliminate the bias you’re talking about.

**DR BIBBINS-DOMINGO:** Another thing that strikes me [as] related to equity is that we have talked a lot about population health, which of course has to appreciate the many social factors that influence health in general, influence processes of health care delivery, and those types of things.

**DR BINDMAN:** We have launched a very concerted effort to understand the social risk factors for our members because we know how incredibly important these are in terms of influencing health outcomes. That’s important to make sure we’re not being biased in our treatment but that we’re also focusing on outcomes. So we’re systematically collecting information about where people live and what transportation challenges they have, the challenges they have around food security and housing stability.

We do this by also communicating with our members about why we’re doing it. We’re not just collecting it and hoping to do something with it from a research perspective, but also because we want to take an action step. We have electronically connected and created a network of community-based organizations relevant to each of our geographic areas so that if a clinician identifies a patient who has a need in one of these social areas, they’re able to essentially do the equivalent of writing a prescription to connect that member with a resource in their community that is designed to help them.

And that organization is electronically connected with us and communicates with us. And we are particularly homing in on some of our members, for example, those who are going through very complex care like cancer care or who are demonstrating to us that they’re having trouble making appointments or picking up prescriptions. So using certain clues as a way to collect that information and to act responsibly by providing help.

**DR BIBBINS-DOMINGO:** Whenever we have a new technology like this that we know is going to be disruptive, there will be lots of good coming from it. But there are other issues that we have to protect. What do you think the role is for government—local, state, or federal—to protect the interests of patients, clinicians, or whoever it might be?

**DR BINDMAN:** This is a great question and a really important one—that we need to both recognize the incredible promise and possibility of these tools. What we’re seeing with AI and machine learning is both incredibly powerful and exciting as a potential tool. But you and I have enough experience to know that almost any innovation comes with risks of untoward effects.

So we need to make sure we’re building a safety mindset and an evaluative mindset into anything that we roll out. What’s tricky to think about is that AI encompasses a wide range of things. As you’re well aware, the FDA [US Food and Drug Administration] has already identified a certain role related to certain kinds of specified software that is very specific in certain areas related to using machine learning.

I think where it’s more tricky is in the generative AI area, which has generated so much interest in the last few months since many people are starting to explore that. What’s hard there, as I understand it, is that...
it doesn’t necessarily perform the same way each time. This creates a bit of a regulatory challenge about what, in fact, is the entity that is being regulated here. This has already come up in our NAM AI Code of Conduct work. Is there an entity that already exists that has the right kind of multidisciplinary mindset to be able to do this within government?

It seems like this is a broader and more complex task than we’ve historically given FDA alone to do. The FDA may be good for narrow prescribed uses of AI in which it’s analytically bringing together certain data elements to predict a certain outcome, like whether a hospitalized patient is declining and therefore heading toward the ICU.

That sort of tool performs the same way over and over again, and the FDA may be in a position to regulate that kind of tool. Generative AI, which functions in a different way in terms of repeated use, may be harder to regulate. But your question raises a key point, which is that we don’t want to introduce a tool that will create risks to people’s sense of privacy and introduces errors that humans are not able to oversee in some way.

So we need that in place. The thing I think that has been fascinating from our conversations in this NAM group thus far is that it has pointed out that care as we deliver it today is fraught with all sorts of challenges of taking the best evidence and turning it into the best care, that lots of decisions wander away from what might be the best actual advice to give our patients.

So the advantage of these tools in terms of closing the gap between evidence and practice is really powerful. I guess what I would say is what our group has said, “Let’s not make perfection be the goal that has to be reached in terms of how we regulate these things. Could it be that it’s just way better than what we’re currently doing?”

As a result, there should be, some have said, maybe an imperative to actually use these things because of how much better they could be. And I think that balance has to be found between improvements in care as well as some of the identifiable risks that we’re willing to accept or how we can control those risks in some ways.

So I think this is a real challenge with things, like some of the tools that are being put in place to support cars and how people drive. These same tools might make for overall safer driving, but when we see accidents happen with those tools we all get very alarmed because we wonder, did the machine lead to this problem?

This is a difficult challenge that society has to figure out, that right balance. We probably can’t eliminate all risks, but these tools can perhaps help us to eliminate some of the risks that are not always visible to us today in how we practice medicine. That’s really some of the discussion we’re having at NAM about how to make those things visible and to figure out what are the right safeguards to put in place. What’s the role of government around that? What’s the role of private actors as well?

A model is our National Transportation Safety Board, where there is federal oversight that brings together the information but also requires private entities, in that case private airlines. In our case, it would be private health systems sharing data in a way that allows everyone to learn from it but isn’t done in a way that introduces new risks—legal risks or things that would get people sued or put at a competitive disadvantage because they’re sharing the information. And I would love to see thoughts about that kind of a structure put forward because this is such an important area that we all need to learn together. I think there’s an opportunity to consider that kind of a model.

DR BIBBINS-DOMINGO: JAMA recently put out a call for papers on AI in clinical practice and AI in medicine. You have a long history as a researcher bringing data to bear on these important questions. What types of studies would you want to see that would help us as we continue to move forward?

DR BINDMAN: I’m so glad you’re doing this at JAMA. Thinking creatively about all these applications and how AI might be used is really an exciting thing to create a forum around, for us all to be learning collectively. It really runs the gamut from some of the things that can go on in what I call the back office. Like how do we more effectively do some of the documentation, some of the logistics around effectively helping patients steer to the right level of care based on their problems or symptoms.

You and I, as primary care physicians, have personally provided that role for many of our patients over the years. It’s like, okay, we’re the first stop and now we’re going to help you navigate this system. Wouldn’t it be amazing to have these tools be able to provide some of that navigation? We all know how complicated our health systems are. There’s a tremendous amount of opportunity in that kind of space.

And then clearly you could run all the way up to the diagnostic end and the treatment end and think about how we can create better alignment between evidence and putting it into practice. To me, that’s where there’s just so much promise of striving for innovation in health care.

What’s so unfortunate is that we have so many innovations that we don’t even fully implement and give to everyone who could benefit from them the chance to benefit from them. So I’d love to see work related to creating better alignment between things that can help patients and then getting them those treatments and learning the difference it made on their health outcomes.

These prediction tools are super important, but we’ve got to learn about the experience, too. We need to understand how patients feel about these things and how our doctors feel about them. Everyone still has to be in the arena of care and understand how care is changing for them. And we need to listen clearly to our patients about their experience.

I was so struck by the study in JAMA Internal Medicine about empathy and how patients responded to AI-generated answers to questions vs those that physicians provided. And we got real insights that there could be real power in the ability of AI to assist us to give the kinds of answers that are meaningful to patients.

That’s an incredibly important area—communication and how we can become more efficient and better at that. This is such a tremendous opportunity. But I hope we will continue to think about all the stakeholders in the environment. That’s the patients, the clinicians, the nursing staff, all of our health professionals involved in health care delivery, and everyone who supports that work.

And think about how these tools can be used to support their work, to make work better, to ultimately lead to better care experiences and health outcomes for all of our patients.

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