USC MPH: What's Trending in Public Health Jobs

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Paula Amezola: Well, good evening everyone. Thank you for joining us, and I love to see a full room. Right now there's prospective students next door, and that's why we didn't get the big room, but the great thing is that you may get to mingle with some of our prospective students during the networking event. They will end after ours, so hopefully you get to see them, if not, just welcome them to our school. At this point I would like to thank the MPH program for allowing us to hold these networking events, and for sponsoring these events. Also, MAXA has been an integral part in helping us coordinate and facilitate this. Without the student volunteer help, it would be really difficult for me to hold such events by myself.

For those who have not met me, my name is Paula Amezola, and I'm the career services advisor and coordinator. I am an epidemiologist by training. I have been in the field of public health, for 14 years. I started my work doing epidemiology in a clinical setting, and then came to USC and worked mainly doing research. I found my passion, which is, community base participatory research. I still do some work outside of career services so I like to stay in the loop of what's happening in public health. That's just a brief introduction of what I'm ... Who I am.

Here's our agenda. We will have presentations that last around 10 minutes. Tim will have a more fluid presentation where he is welcoming questions during his presentation. Please feel open to asking questions during his 10 minutes. Then subsequently, all other presenters will have a formal presentation, and we can ask a question at the end. I am hoping that we can, after the presentations around 6:30, move into our lobby area, where we will have some light refreshments, and each presenter will have a table where the students can go and network one on one with each of the presenters. I encourage you to talk to each of the presenters, because they just have a wealth of information, and you may learn something that you didn't know or that you didn't learn from the presentation.

We are recording this session so please turn off your phones or silence them, and try your best to be as quiet or as silent as you can, so that our online students or those students who couldn't come today can have good audio for our presentation. Our first presenter is Tim, and I'm sorry if I kill it, Laios.

Tim Laios: Perfect.

Paula Amezola: Okay, fantastic. Thank you. Mr. Laios is the Chief Data Officer and Vice President, Analytics and Informatics of Health Services Advisory Group. A position to which he brings more than 15 years of experience leading health care data, analysis, and informatics contracts for a wide array of federal, state,

and commercial clients. In his role he at actively oversees approximately seven employees, I mean 70, consisting of health care analyst, statisticians, and researchers that support more than 50 active projects.

During his tenure, Mr. Layels has served as a program director for multiple federal and state contracts related to informatics data analytics, health care research program evaluation performance measures calculations, and survey assessment. I'm really excited that he is the primary survey contact with the National Committee for Quality Assurance, because a lot of our students are interested in conducting and doing and working with quality assurance. He is one of our ... A person that can answer some of your questions. He oversees HSAG's state and corporate survey activities, including the Consumer Assessment of Health Care Providers and Systems. He has an MBA Degree in health care management and a Masters of public health in clinical epidemiology. Please give him a warm welcome. Thank you.

Tim Laios: Thanks Paula, I appreciate it. Well good evening everyone, I'm very excited to be here and have this opportunity to chat with you about a field that I'm extremely passionate about, and that is public health. I think all of us in life at some point find our calling. In about 20 years ago I identified public health was my calling, and more specific data analytics within public health. I'm really excited to talk to you about public health today, because we really are in a exciting year. It's an era where big data is emerging, and we're leveraging that data in very new and exciting ways to improve our health care delivery system and a quality of care that patients receive. So, I'll talk to you a little about what we do at Health Services Advisory Group, talk to you a little bit about what our Public Health and Analytic employees do, then I'll try to answer some of the questions that Paula was so kind to share with me.

Paula Amezola: Can you come to the podium so that we have that-

Tim Laios: Yeah, absolutely, would it be helpful for me to come up here? Let me just grab a flyer too, you guys. So at the end of the presentation, if you want to learn more about the company, because obviously I won't be able to cover everything, we'll have a little one page flyer that will summate. Health Services Advisory Group has been around for almost 4 decades. We are a firm that is focused on health care quality. When I say health care quality, I'm talking about the entire spectrum of health care delivery of the United States. We focus on assisting facilities, whether they be hospitals, nursing homes, home health agencies or dialysis centers, and even all the way down to providers with the delivery of care. From a data perspective, a lot of what we do has to deal with evaluating the performance of these providers.

So as part of our work, as I mentioned earlier, we're involved in a lot of big data projects. When I say big data, let me give you the scale on this. We oversee quality oversight for Medicare in four states, California, Arizona, Florida, and Ohio, as well as the U.S. Virgin Islands. I'm hoping I get to visit

there soon, I hear it's very nice. That constitutes about 25% of the Medicare population nationally, and that is kind of what were we're capped at as an organization. The federal government says "No one firm can oversee more than 25% of the Medicare population as it comes to quality." That's what we do, and as you can imagine the Medicare population is a population that often from a clinical perspective, has numerous challenges in terms of managing these populations. Not only do you have patients that are older and have multiple chronic co-morbidities, but they also tend to have many social issues that come and evolve as part of the normal is aging process.

In addition to that, I mentioned our Medicare work, we are involved in Medicaid quality oversight in 17 different states. That's about 45% of the Medicaid population nationally. I want you to think, we have data on all of these patients. So, a quarter of the country's Medicare population, we have all of their claims and count their clinical data. 45% of the Medicaid population in the country, we have all of their claims and count much of their clinical data. So we're actively involved in ensuring that not only are these individuals receiving the highest quality of care, but as you can imagine, the big focus these days is on eliminating health care disparities.

Unfortunately, despite the best efforts of many, we have a health care system in which there is disparate delivery of care, and there are populations of patients for a variety of reasons who aren't receiving the standard of care, and we as an organization are focused on that. So, in addition to the projects I've mentioned, we have a number of national projects that we're involved in. I won't get into all of them today, but they're summarized here, and you can come stop by and chat with me, and pick my brain. I'd be happy to discuss any and all of it.

How much have you guys heard about MACRA, and MIPS, and qualities, new acronyms? In here's a shy group, or no, not a shy group? In 2014 ... So, you guys have heard about the affordable care act, right? Obama Care. That has really changed health care delivery in this country in exciting ways, but also in challenging ways, because with any new implementation, it's never going to be perfect right? So, over time the legislation associated with that type on endeavor needs to as well.

In 2014, the federal government introduced what's referred to as MACRA, which is the Medicare Access and CHIP Reauthorization Act. I won't get into the details of that today, because an important component of that, that you'll hear a lot of physicians in the community focus on, that has to do with a merit based incentive payment system prepositions. What's been happening over the last 10 to 15 years is, we're transitioning away from a system where we just pay facilities and physicians for providing care based on the frequency with which that care's accessed, to a system that is now going to pay and reimburse facilities and physicians based on the quality of care and the value of health care that they provide. So those entities and those positions that are

providing a higher level of care, will be reimbursed at a higher rate. So, what is the goal? The goal is to reduce cost, because in theory the more valuable the care is, the less expensive it becomes over time. In addition to that, we're hoping to improve patient outcomes.

We as an organization are leveraging all of this data that I talked about to evaluate physicians, facilities, to determine the value that they're providing to their patients, and then we work with them. We have a clinical side of the house that will actually work with them, help address and deficiencies they might have, and to really help them improve the care that they're providing. So, we work with a lot of different types of data. I mentioned administrative data, claims and encounter data, which is basically billing data. In addition to that, we work with electronic health record data. I'm sure all of you have been exposed to a little bit of that for your education today, or heard about the concept.

We collect data directly from patients. A lot of that survey data, and it's very valuable. It's always important to keep the experience of the patient in mind, because even if from a clinical perspective, you've provided ideal care to a patient, if that patient reports back that they're very dissatisfied with that care, they're less likely to be adherent with the treatment regimen moving forward, and thus are much more likely to have poor outcomes. So, it's always important to view the patient perspective. There are variety of surveys, one I've mentioned in my bio are the NCQA surveys, the HEDIS/CAHPS Surveys, but there's a whole assortment of surveys.

So my division, as Paula mentioned, right now we're probably close to 80 employees, I think by this spring we'll be closer to 100 employees, but this little group is actively growing. We're focused on taking the data that's available to us, and evaluating that data in a variety of different ways, to not only assess the performance of facilities and individual providers on a wide array of different topics. For example, we may be evaluating physicians in the state of California as it relates to the quality of cardiac health care they're providing. They have a cardiac patient, are they properly managing that cardiac patient's blood pressure? Are they properly managing that patients record values? Are they properly following up with the diabetic patients, for example, initially diabetic patients, in other words, properly? That's one aspect of what we do.

We're also actively involved in looking at patient safety in the nursing homes. Patient safety is, all of you will find that you enter the quality room, is a huge area of focus. From my perspective, and when I talk to my staff when I on-board them, one of the most striking pieces of information that they come across is they're much more likely, each and every one of us in this room, is much more likely to die due to a physician error or a preventable event in a hospital, than we are to die at the hands of a firearm combined. Some of those studies show that we're 66 times more likely. So, there's a huge need to

focus on improving the quality of care, ensuring patient safety, and given that we spend more on a per capita at a basis than any other country in the world, there's no reason why we can't address the current deficiencies that are preventing us from providing the highest quality of care. So, that's kind of what we do, why we do it.

One of the questions that Paula was nice enough to share with me is, "What are the types of jobs available within my organization for public health professionals?" As you can imagine, there are a lot of data related positions. We have positions vary, they're referred to as health care analyst or informatics analyst. They're basically one in the same, they're data analyst type position, and these are individuals whose focus is on actually evaluating these data, and working within a context of a broader team to extract value from that data, and based on what they determine conveying that information back to the clinical staff so it can be taken and leveraged to help improve care. For example, within a particular population.

There are also analytic coordination in management positions. I know many individuals who go through public health training may not be interested in a career where they spend a significant amount of time and stay perfect. They come to me and say "Hey Tim, I love epidemiology, I love statistics, I love being involved in research design and writing, but I'm not somebody to sit there and write SAS all day, every day." So, in those cases these individuals can get involved in coordination positions, where they're either coordinating from a data perspective, coordinating activities that need to go on to ensure that everyone that's working on different data components of a project are doing so in a collaborative and cohesive way, so that we can address the research questions at hand. For example, is this community in Southern California reducing the admissions, and if so, how are they accomplishing that? Or you may be working with a clinical team, and helping to facilitate the implementation of an intervention in the community or implementation of an intervention in the nursing home side. So there's a lot of opportunities within my organization, as in with the public health professionals and that type of work.

We did have a successful internship program this past Summer. Just so you know, we're based out of Phoenix, Arizona, that's where our corporate office is. We have 500 individuals, 500 employees across the entire organization right now. As I mentioned about 80 of those staff are analytic individuals within that division. The majority of the analytics staff are based either in Glendale, California, which is very close, looks like a 20 minute Uber ride from here, you could do that. We have some in our Phoenix, Arizona office, and then some in Tampa, Florida. So, for those of you that aren't tied to the bay area or to the bay area kind ... I'm from the bay area, so sorry, and we do have an office in the bay area as well, Burlingame, right outside of San Francisco. For those of you that aren't tied to the L.A. area, there are other opportunities within our organization throughout the country. The other question I often get

asked, I was glad ... Oh, I'm out of time. Are we okay?

Paula Amezola: Do you have one more question?

Tim Laios: One more question, and please ask questions afterwards. The other question I often get asked is, what constitutes, or what are we looking for as it relates to a potential candidate that's interested in a career in data analytics? They want to be a data analyst, a health care analyst. The first thing that I look for, and you got to understand I've hired hundreds of people within the country. The first thing I look for when I go to a candidate is, are they passionate about public health, and are they passionate about the quality and focus of our organization? If they're more interested in programming, or they're more interested in expanding their statistical knowledge base, we're probably not going to pick that. If they're really passionate about saving lives, improving care, then we're the type of organization that they would thrive in.

Beyond that, the second thing is what all of you are doing. Having foundational education in something that's public health or public health related. I'm biased that MPH is good, because I have an MPH, but you know, MPH's, MS's, all of them are individuals that we hire, and all them have been successful within our organization. What you're going to find is, either training is going to provide you with the foundational knowledge you need, and that once you start working you're going to rapidly begin to build. Beyond that, it really comes down to strong communication skills, because you'll be working in teams. If you're working with individuals in different offices throughout the country it is imperative that you're able to communicate with everybody.

If you're considering a career as a data analyst you probably want to have some experience programming, whether is be SAS programming or programming another language. Not that it's critical to joining our organization at being able to take on work from day 1, it's more important for you as a candidate to understand whether or not you like that work. So, the more exposure that you have to that in advance of applying, the more informed of a decision you'll be able to make as it relates to that type of work. I'm sorry I ran over Paula. I want to thank all of you for your time. Please feel free to ask me any questions you might have later. Come talk to me outside, I'm here. If you want my business card, come grab my business card, I'd be happy to connect with all of you and keep in touch. Hopefully we'll see some of you in our intern program and working for our organization in the future.

Paula Amezola: Come this way, go ahead.

Mona Desai: I'm sorry. [inaudible 00:20:05]

Paula Amezola: [inaudible 00:20:06] That'd be great.

Mona Desai: All right, thank you. I'm so sorry, [inaudible 00:20:14] from the town.

Paula Amezola: We'll this is perfect timing, because I did have Mona scheduled for the next speaker.

Mona Desai: Are you serious?

Paula Amezola: But I'm going to be nice, since she is one of our alumni, and let her de-stress a little bit.

Mona Desai: No it's fine, I can do it.

Tim Laios: I knew Mona was running late, so that's why I ran a little over a little bit.

Mona Desai: We're all working together, it's a community.

Paula Amezola: Thank you Tim, that was a really good presentation. I really appreciate the combination of bringing public health into big data, and how these two are working together now. That is the shift, and that's what we're seeing in the workforce, that big data is impacting public health in a very big way, and this is why we're having this type of networking session today. Now I'm going to present Mona Desai. I'm sorry if I ... Is that correct?

Mona Desai: No, that's perfect, yeah.

Paula Amezola: Okay, fantastic. The first time is perfect, the second time I don't know. Well, Mona is one of our Alumni. She received her MPH here at our USC MPH program in health communication. She currently works as a director of marketing at Jacobus.

Mona Desai: Jacobus.

Paula Amezola: See, I'm sorry. I apologize to all of you, because me and names don't get along. All kinds of names. Where she develops and leads growth in innovation strategies in the health care enterprise software industry. As director, Mona is responsible for driving market leadership and awareness, content marketing, demand generation, public relations, strategic events, and digital communications. Prior to her work, Mona led collective marketing at Zynx Healthcare, and worked as an analyst at Hollywood Health & Society, and Mona is passionate about health education and healthcare policy analysis. Please let's give a warm welcome to our alumni, Mona.

Mona Desai: Do I just come up here?

Paula Amezola: Yes, please.

Mona Desai: Okay. Hi everybody. I'm so sorry. It took me almost 2 hours from the west side so ... Never fun to be in traffic. I also lost my license, so I had to take an Uber.

Paula Amezola: [inaudible 00:22:49] the mouse or the arrows.

Mona Desai: Okay, cool. Yeah. So, I mean ... and I should speak into this?

Paula Amezola: Yes.

Mona Desai: Okay. Can you guys hear me okay? Are we good? Okay. Nice to see you guys. I'm going to take a minute and just soak you in, because on the road yelling at the cause of traffic. So, when Paula asked me to join you guys today, I really didn't know what she wanted me here for. I come from a various background. I started really actually in law. So, I thought I'd become a lawyer, I had these big ambitions, and then realized that most of the lawyers I work with were completely miserable, and they were doing it for the wrong reasons, and so I thought that can't be me in my life, and then I went and I searched, and did a little more soul searching, and figured that communications was really kind of my steam, and I thought health communications was really great.

I found USC, and I applied. I got in, and it was an amazing program to be a part of, and the opportunity that I got was an internship at the company called Zynx Health, which is a healthcare information technology company, which I'm sure a lot of you guys are hearing about health IT and all of that right now, it's pretty big. Big data, I heard one term when I walked in. After that, I did that for a few years, and then after that, I joined a consulting company. So, Paula reached out to me as sort of you're in the consulting business, and what can you teach us about that as it relates to public health? So, I put together a really small presentation. I think that's what you want me to focus on, right? So, all right, cool, we'll start there.

So, I'll just give you a little background about what we do. We're a consulting company, a professional services firm, that offers services to healthcare organizations of various kinds, so community hospitals, critical access hospitals, innovative delivery network systems. So, we have pretty large clients, and some really small clients as well. What we do, is basically go into different hospitals and work on their clinical care delivery systems, their financial performance arenas, a revenue cycle and things like that, as well as the overall sort of, financial components of an organization. A lot of EHR implementations and optimizations, and electronic health record systems, and ERP systems as well, which are really enterprise wide systems that really organize your operations at a hospital.

So, the consulting services are what we provide, right? We go in and say, "Okay you have a broken system, we're going to come in and fix it. We're going to come up with a strategy. We'll bring our people and our processes that are tested and proven, and implement all of that in holistic fashion to really bring back your ROI, make you more money, because right now of course the theme in healthcare is improve quality of care, but reduce costs

rates, right?" So, that's kind of the biggest issue that everyone's facing today, and there's tons of regulations around that the hospitals are faced with. As we know, the cost is rising for healthcare. So, it's just getting ... The demands are really, really high on providers now, as well as patients, because we now have the divergence on the patient a lot too, with Obama care and everything. So, that's in a nutshell, kind of what we do. I'll just move on because questions are coming later, right?

Some of our clients ... Just so that you can see who we've worked with in the past, they're just a variety of different ones. I just put up some of the logos that we work with. They're all over the United States of America. We also have some clients in the U.K. and in Ireland. This is just a really tiny slide so you can check this out later, but this is a summary of our services that I basically gave you an overview of, but as regulations change, I think the largest challenge for a professional services firm is figuring out how we continue to stay relevant, because things change constantly. So, not only do we have to meet the needs of our customers, but we have to be ahead of the curve to ensure that whatever they're dealing with, or will deal with in the future, we can actually address for them ahead of time and be proactive. Because at the end of the day, we're the smart ones coming in to solve their problems, because they're heads down in whatever they've got to do, right? So, that's kind of the role we play.

Here's a lot of stuff here that you can look up later if you want. I can send you the other slides after this. So this an example of what we might do, we take broken systems and then we fix them. I kind of explained this earlier, but on the left hand side you'll see kind of an image that we put together which is really ... There's different pillars to how the patient centric revenue cycle could operate, and because most of the hospitals function in silos, each department doesn't communicate, and that includes not only through technology, but also through themselves, that they call us to say we need help, we need you guys to come in and just really make us work together, make our processes even more efficient, and help us make the money that we're losing every day. On the right side is what we basically do by the end of it. It's a transformed revenue cycle. I kind of talked about this a little bit already, but strategy pulling process technology and people, that's really the job at what we do at Jacobus.

I was kind of proud of this, so I thought why not just include this, but we were Class top rated. I don't know if you guys are familiar with the Class Research Firm, but they're basically, they evaluate healthcare systems. They evaluate healthcare consulting companies, and healthcare technology companies, and provide what they would consider non-biased commentary and scores to consulting firms like myself, like ours, and give that information for free to providers. So for hospitals, like CEO level executives, so that they can evaluate which vendor they want to purchase and work with, or collaborate with. So, we were really proud of this that we were ranked pretty high on their recent

report. Those are some of our competitors and other consulting firms that we actually compete with. This is just a quote, we'll check this out later. Our mission at Jacobus is to really work with the healthcare mission, which is to achieve what matters most, and support our caregivers, and provide the best care possible.

I also have a question in the pamphlet that I got about just internships and what to do, and I thought you know, I think a good place to start would probably be at the HIMS organization, that stands for Health Information Management Society. They're basically the largest healthcare informatics, healthcare information technology organization out there. They have over 30,000 members that are a part of the organization. Every year they hold an annual conference, in usually February or March, and everybody comes together. There's a lot of education sessions, and it's all tailored to healthcare IT and everything else around it. So, informatics, whatever the trends are in population health, high statistic stuff. I mean, it's massive, it's really huge.

Every year they host in a different city, but I thought for people that are interested in getting into the health IT world, which is what we specialize a lot of our work in, this is probably a good place to start. They actually offer them to students. You can just reach out to them directly, and they'll probably match you up with something if you're interested in this field, but they are really willing to work with students. You have to be a member, but I believe if you're a student they give you some leeway to work with them. I wanted to throw that in as something that you guys can consider. There are regional chapters all over the U.S. that you can join. So, if you live in Southern California you can join the Southern California chapter events. They have events all year around, all the time, and if you're a student you can probably either get a discount or get to go for free, which is kind of nice.

The next one I found was a career round table. So, if you're interested in going to that, it's in San Diego, you can make a weekend out of it or something and check it out. I mean, I just went over that really, really fast, and I don't if you want me to talk about trends in just other areas. Yeah? You want me to talk about improvements? Okay, I'll make this fast.

What are we facing right now? At least from a consulting perspective, our customers, which are really hospital executives are who we have to face, right? So, CFO's, CEO's, CIO's, which are chief information officers, chief medical information officers, chief nursing information officers, they're all facing a lot of different demands like I talked about. Some of the big ones that are really hitting them in the next wave of healthcare all revolve around population health and predictive analytics. That's kind of been the massive theme.

I think big data plays a really huge massive role in that, but from our perspective, we have found that, I was just at a conference recently talking

about this with a ton of people, that being predictive and trying to predict the outcomes of particular population is what's next, so that you can prevent it, develop the right community plans, put public health plans in place to really prevent it or reduce the rate of whatever it is, a disease or a state of affairs in a particular area. So, that's really been the biggest theme for us.

It's a challenge in consulting to address that right now, because a lot of the hospitals and healthcare organizations that we work with are not necessarily cutting that drape. They're still kind of catching up. I really liken them to DMV. The DMV systems were down all week, and I'm like, "You guys have to get your stuff together." So, there are such gaps in technology. There's gaps in communications, so they're still kind of working through all of that. They're always talking about how do we Uberize healthcare, how do we do that? You can press a button on your phone, and suddenly have technology wait for you, or a car coming to pick you up. How do we make that so that mobility is available for patients as patients aren't mobile?

As you are all patients. I'm a patient. We're all a patient at some time in our life where we take care of our families or something. How do you meet them where they are? So, it's really about consumerism in healthcare is really the next thing too. How we actually meet patients where they are? How do we ensure that as they are changing and evolving in their life, and actually not even needing to come into the hospital in the future? That scene's all virtual, you could probably get your pharmaceuticals done through the internet, or your appointment scheduled through the internet. That's becoming more and more common. How do we make sure that we can, through the protection of health information, continue to provide them quality care and quality services?

So, that's been the kind of recent sort of uptick, if you will, around topics that are really of interest to more of the academic institutions, and are the sort of the forefront communities out there and the healthcare organizations. The others ones that we're still working with are smaller are smaller community hospitals, and they are kind of, kind of back, they're behind a little bit, just because of their resources and they're really struggling with their money and all that kind of stuff. I think I'm out of time. If you have any questions please feel free to come ask me.

Paula Amezola: Thank you so much, Mona. You're so brave to walk in here after dealing with traffic, and just come and present. She did a great job for just walking in, right? Thank you. So, our next presenter is actually someone that came last month, and we had a cancellation. I think I emailed like 50 speakers for this presentation, and I have at one point eight like, "Let me check my schedule." By the time it was getting close, I said, "You know, we really need to just go with who is gonna show up."

So, I invited Ragy Saad to come again, because he does work with health data,

and I just thought it would be a very interesting, to have this group of students who are interested in data hear from him, and I did see his presentation, and it is a little different than last time. Let me take his [inaudible 00:35:04]. I'm sorry. I just briefly wanted to mention why we have brought him back, because he so graciously was available to come back, and we needed him.

So, Ragy is also a alumni. He did his master's in global medicine from USC, and he has been with Doctor Evidence for four years, and currently serves as Associate Director of Clinical Operations and Data Integrity. In this role, Ragy oversees all aspects involving data configuration and quality assurance, practices among various teams analyzing published peer reviewed clinical trials. This data serves as a foundation for analysis that stakeholders within the healthcare field use to guide the methods patients receive, and the interventions they receive, okay? So let me just ... Let's please give him a warm welcome.

Ragy Saad: It's good to see everybody again. Paula said I changed it, I just changed the background, it's the same thing as last time. Before I get started, actually I like doing this again, because I want to thank Paula and her team for inviting a team of us to come and speak with you guys. I think all of us have had experiences going to other schools and other programs, career fairs, things like that. It's really rare to have a graduate program that puts so much effort into ushering students into a career.

So, I want you guys to think about the anxiety that you feel about finding a job, finding the right job, finding the right job quickly, and imagine what that stress would be if you were at a different school that doesn't have a networking night every month. That doesn't invite employers to come and travel, and meet you guys, and offer internships and job positions. So, let's just thank Paula and her team, because this is really, you know, this is for you guys, and that's a lot of effort that they put. Of course, we are excited to meet you guys as well, so thank you for bringing us.

So, with that said, let's get started. I wanted to frame what Doctor Evidence does a little bit more specifically into how ... Excuse me, my voice is just gone today ... How big data intercepts with healthcare. We've heard a lot of different scenarios, and there's a lot of ways that it does, but just from the vantage point of our companies, what is that intersection? How does it play out? Before we answer that question, let's take a step back, and let's think about, how do we achieve high quality patient care? What is the recipe? What are the components that go into high quality patient care?

There's a few different perspectives, but if we take a look at just the patient perspective, there's probably a few key components. Now, all of these kind of function in harmony with one another. If you put the emphasis on one over the other ones, you guys will see how it starts to, it actually, it takes away from the quality a little bit. So, let's start with the first one. Patient

preferences. We can actually call those probably patient concerns. So, what are the concerns of the target population for a specific disease that you're trying to treat?

Now, you can see if you put an over emphasis on patient preferences, you start seeing a marginalization of different patient focus sites. So, I'm sorry if there's any fans up here, I have to put it up here, WebMD. There's other patient focused sites where they transfer the onus of diagnosis and treatments from the clinicians, to the patients themselves. So, patients now are taking ownership in researching their conditions, researching interventions that are available, and then approaching their doctors with their recommendations, or with their thoughts and their plans. It's a very integral component, so long as it's not over emphasized.

What's another component? Clinical judgement, or clinician judgement. I think this is probably more reflective of what the modern day healthcare system looks like. So, patient preferences working in congruent with clinical judgement. So, you go to the doctor, he tells you you have high blood pressure. The doctor tells you, "We have these drugs that can help lower your blood pressure." The patient can say, "Oh, I prefer Lison medications, but if you think these drugs are better, then I will take these drugs. That's probably the normal scenario that we've experienced, although it's definitely shifting.

But Doctor Evidence believes that there's a third component that goes into providing high quality care, and it's so important, we actually put it in our name, and we call that evidence. So, Doctor Evidence is all about integrating evidence into the model for providing high quality patient care. So, I'm sure everybody here has heard about evidence based medicine. Is there anybody here who hasn't heard those three words? Awesome, you guys are in the right place.

So, evidence based medicine. So, evidence, patient preferences, clinician judgement, now we have a focus on evidence. When did healthcare, when did medicine become evidence based? When did evidence become even part of the equation? I think this is really important to go into, because the intersection of big data and healthcare is actually here. Evidence based medicine is the product of big data and health, that intersection. Historically, this goes back to a publication back in 1992. Gordon Guyatt, who is a researcher working up in McMaster University, published a paper about changing the paradigm of how healthcare is practiced. How clinical settings can be shifted to incorporate evidence based practices in treating their patients. This was probably at least a decade advanced from reality, because back in 1992, some of the paradigms that will shift, I don't know if you guys can read, pro not, but I would look at this paper.

The evidence based practice really stopped at clinicians doing informal literature reviews, and then bringing that information, doing qualitative or

quantitative assessments of that data, and then using that to guide the treatment plans that they provided for their patients. This was evidence based practice that revolutionized what evidence based medicine means. Now big data comes in and basically takes this to whole ‘nother level. So, what is big data? It's kind of misleading, because big data puts an emphasis on the data. Do we suddenly have a large amount of data? Yes and no, but big data is really talking about the technological tools that we had to digest and analyze large amounts of data. So, patient records, clinical studies, which is what we focus on. Big data tools and practices have allowed us to digest and analyze this data in efforts of promoting high quality patient care. Not just that, but to do it efficiently and transparently.

This is really important to emphasize those key points, because have we ever had the ability to digest and aggregate large amounts of data before? Yes. Systematic reviews are one great example of that. So, in a systematic review, you have a couple of bio statisticians, with a couple of key opinion leaders get together in a group, about nine to twelve months, and they come out with a 12 page PDF document on the systematic review, and that becomes the new landmark for what the body of evidence says about certain types of treatments. Now we had the ability to do it, but it was neither efficient, nor transparent. So, it didn't really have the impact of ushering the EBM field. Big data, the ability to compute large amounts of population data, that now allows us to integrate those type of needs into healthcare.

So, how does Doctor Evidence play into this? How does Doctor Evidence utilize data analytics, big data, to change the way patients receive care? Let me give you guys a case study. This is a very recent one, probably a couple of weeks old, and a very true one. I haven't changed anything, I just got names and ... But you guy will see data that we collected. We have a male patient with late onset hypogonadism, so he had low testosterone level, which is really common for elderly men. He approached us, and he wanted to know about the safety of taking testosterone replacement therapy. Do we have any medical students here? Anybody MD, MPH? No? Anybody going the clinician route? What would be some of the safety concerns of taking testosterone replacement therapy for a long time?

Speaker 6: Side effects.

Ragy Saad: Okay, what would be an example?

Speaker 6: Um.

Ragy Saad: Tim, you can answer.

Speaker 6: [inaudible 00:44:48]

Ragy Saad: Well, let's give one more person a shot first.

Speaker 7: I don't know, maybe acne, or hair over the body?

Ragy Saad: Yeah. Yeah, definitely. Unwanted acne or hair growth. Tim, you can answer.

Tim Laios: Elevated hematocrit's a big one, that's a short term, and also worried about its impact on HDL. Some patients are very sensitive to that. It can basically crush their HDL, which puts them at much more risk of developing atherosclerosis, and there's a whole body of evidence. I'm sure you're going to get into it, that's a little bit controversial in this area, but this is revolutionary. 20 years ago, older patients that had symptoms of hypogonadism, they weren't put on TRT. The only type of hormone replacement that was talked about 20 years ago was estrogen replacement for women. What we found though, is in elderly individuals, if they don't receive testosterone replacement, that puts them at risk for a number of different poor outcomes, one of those outcomes being increased risk for poor cardiovascular outcomes. So, I'm glad you picked this case study. It's an interesting case study, and I don't want to steal anymore of your thunder, but those are the big things that you worry about right at the beginning.

Ragy Saad: No, it's good. The hematocrit point is actually interesting, because it's one of the most common reasons for drug discontinuations in clinical studies for testosterone replacement therapy. So, you know, one of the things that you might think, and I was hoping to pick on a medical student, because the first thing they would have said was prostate cancer risks, or elevated PSA, prostate specific antigens. There's been a couple of recent systematic reviews that have debunked that, so I wanted to pick on somebody. That's okay, we'll do it another time. The hematocrit, cardiovascular, lipid levels, those are definitely some of the things that we looked at.

So, the patient comes to us, wants to know about safety. So, how do we apply big data, and data analytics to that situation? We frame their clinical question ... We re-framed it, we contextualize it into a different framework, and we call that PICO. So, PICO is the patients intervention, the comparator, and the outcome. There's actually a few more subsets of that acronym, but that's what we focus on. So, we looked at all the studies that have ever been published that looked at men who were otherwise healthy, but had late onset hypogonadism, and they received, our introduction was testosterone therapy, and all subtypes of testosterone. The comparator was placebo okay, because there is a difference between placebo and no treatment, which I can't do in three minutes. Placebo, no treatment, and other testosterone therapy. That's what we wanted to note. What is the safety in comparison to these? I blocked out the O for a specific reason. So, we brought back, we did a literature search, we had a medical librarian conduct a literature search in Pub Med, and base, and Medline, pulled back all the studies. We had a title abstract screening, to which studies were relevant, and then we did full text screening, and from that we identified 36 studies.

Am I out? Okay. 15 seconds. ... 36 studies, from that, I'm going to run through. The client is a patient. The patients, they don't know hematocrit levels, they don't know PSA levels, they don't know. They might know acne, body hair, that's a common one, but they might not know the specific safety options they're interested in, so what we did was, we actually gave them what we call, [term invest 00:48:21]. We told them, "Here is every single clinical outcome found in your body of literature. You tell us, what are your safety concerns?" From this, the patient, we sat down with the patient, they selected the outcomes that they were interested in, and we finalized a protocol, and these were the safety outcomes that we focused on. Then we mentioned some additional ones that he was particularly interested in, and from there we went into the actual body of literature, so those studies. We identified which studies had the outcomes that he selected. We did value extractions so we converted a static PDF document into a digital study summary.

I mentioned this last time, once you have the data in a digital database, you can do anything with it. Once it's in this format, you can do nothing with it. You can read it, and pass it to your friend, and walk away and forget it. But in database, you can do whatever. You can meta analyze, you can do landscape analysis, you can do so much with it. The patient was really interested in very broad, he wanted just to answer a question, and we did that in a couple of different ways. One is we ran just a very quick, small meta-analysis, and we did this again, I'd like to recreate one sometime, but we did this one like in probably about 35 seconds. It was just a matter of choosing the right studies with the right groups. We looked at mortality all costs. This was one of those prevalent outcomes. I like to show the relative risk difference first, because it's the most eye shocking, but all our biased statisticians, I'll show absolute risk first, or second.

They're phenomenal, but definitely a significant protective factor for patients who took testosterone therapy versus no therapy or placebo, and even no different is important to know for patients, right? Especially when you're interested in safety. So, we were able to present this to him, and we were also able to generate an evidence report that said, "Based on the body of evidence, here's what happened to every patient across these charts." Now, as part of an EBM center, we wouldn't just leave the patient with this. We have to go back to the model for high quality patient care, and there's three components. There's the patient preferences, clinician judgement, and evidence.

Now, we covered the evidence portion, we have a systematic review, we have the evidence report. I know it's hard to see. So, that's our evidence line. Our patient preferences is him being able to select the safety outcomes that reflect his chief concerns. Now, the last portion is the clinician judgement. This is where the patient sits down with their doctor, and they interpret the evidence report together. They look at the studies, they say, "This one had this result for this reason, it's not applicable," and they make their determination

about whether this patient should take TRT or not off of that. So, that's a very quick example, I do not have time to get through this, but we'll share this.

Lastly, I just want to leave you guys with this. As MPH students, you're probably joining a community of public health, and one of the most exciting times. I don't know about you, but this is the ... You're probably one of the most in demand college graduates there are. I think engineering is definitely, they were definitely high for a period of time, they're still high, but public health graduates, you guys are sought after at an incredible rate.

So, I just want to promote one thing is, after we came last time we developed a part-time training program, because we want to integrate as many USC MPH students as our evidence handles is possible. We have one who's here today, Samantha, who's gonna start training soon. We're looking to fill up training groups with the students that are in this room. So, we're gonna offer a new part-time training program. We're also working with Paula about maybe doing satellite training on campus, if the commute will be difficult, but I don't have time to get into that. I'm gonna turn it back to Paula.

Paula Amezola: Well, I hope that our last three presenters have answered the question that I get. The number one question that I get from our bio stats ME students is, "What do I do with my bio stats ME degree if I don't want to become a faculty. So, we have three very different examples, and there's gonna be ... Our fourth example is a fellowship. We learned from Tim about the quality of data and how to improve the quality of life for our patients. We learned from Mona, how to use technology to facilitate systems in healthcare. Then we just learned from Ragy on how we can use evidence to provide better healthcare to our patients.

Now, we're gonna hear from Chelsea Pho, a very exciting opportunity that I wish when I was getting my degree in epidemiology that we had this fellowship, so that our training could continue, because it is an important aspect that what you learn in the classroom, that learning continues for us who work with data. It doesn't stop, and I myself continue to learn. Even though I'm not actively working in a public health project, I still continue to keep myself updated with the information that's happening in public health. So, let me just quickly get Chelsea's information. Okay. So, Chelsea came last year to present, and I think it was late for the application for this fellowship. The application opens tomorrow, right?

Chelsea Pho: Monday.

Paula Amezola: Monday, it opens Monday. So, we are all here in time to apply to these fellowships. Chelsea is a second year CDC CSTE, and I'm gonna let her take what CSTE stands for. Oh, there it is, Council of State and Territorial Epidemiologists. She's a fellow for the last two years, and she's working at Los Angeles County Department of Public Health in the Communicable Disease

Control Program. She works on issues regarding healthcare associated infections, and supports various outbreak response efforts. Last time we learned about her play in Yosemite, I hope she has another story to share with us today, and Chelsea received her MPH in Epidemiology from the University of Michigan with a graduate certificate in Health Informatics. Please let's give a warm welcome to Chelsea.

Chelsea Pho: Hi guys. Yeah, so my presentation will be a little bit different, I'm just gonna talk more specifically about this fellowship program, which I'm a part of. So, a little bit of background about CSTE, it's a professional network of more than 1,800 bio-epidemiologists spanning all public health specializations, states, and territories, and levels of governments, state, local, federal, everything. Members lead national policy in programmatic change through specialized subcommittees and stewarding national notifiable diseases and conditions.

CSTE's vision is using the power of epidemiology to improve the public's health. We do so through projects, special committees, and member driven work in state, local, territorial, and tribal health jurisdictions. Every three years, CSTE convenes a committee to review and plan for the next strategic plan. Our current goals for 2015-17 include population health surveillance, increasing CSTE's visibility as the home for applied epidemiologists, and building sustainable funding for epidemiology related public health agencies.

So, one way that you can get involved with CSTE now is through our student membership. Being involved with CSTE as a student affords you opportunities such as, annual conference scholarship opportunities, networking with professionals, access to professional mentors, participating in webinars and other training online, and becoming a part and/or participant of the student subcommittee. All of those are really great opportunities that I wish I had the opportunity to take part of as a student, because the student membership is fairly new. So, I really encourage you guys to go to cste.org and check that out. So, sorry we're moving kind of quickly, because I didn't realize we'd get the signs or the time.

So, moving into to more specifics about the fellowship. It began in 2003 as a way to increase epi capacity for state and local health departments. There are three main goals of the program. First is to increase supplied epi capacity in health departments, not only while the fellows are placed in the program, but hopefully afterwards they hope that fellows choose to stay on with their host sites. Secondly, the fellowship provides service to the host agency while the fellow is placed there. And finally, the program provides an accelerated high quality training experience, and prepares the fellows for a long term career placement at the state or local level. I've lost my button.

It's modeled after the EIS program, which is the Epidemic Intelligence Service program, a long standing CDC fellowship. So, this fellowship is competency based program that uses a mentorship model. So, in the fellowship, it's a two

year fellowship, and you're matched with a model based on ... You're matched with a mentor, both based on the mentor preferences and your preferences. So, the way it's set up, it really helps to make sure that you're going to have a good two years, a productive two years, for both you and your mentor that you're working with. There are different program areas in the fellowship. Here are just a few of them. The availability of positions is based on placements in specific areas and locations.

So, like I mentioned, it's a competency based program, it falls into three main categories, epi methods, communications, and public health practices. So, this is just a sample of the different competencies that you're expected to meet during your two years. Having these different competencies really ensures that you get the well-rounded experience, a really comprehensive experience, in an accelerated amount of time. So, here's some of the fellowship compensation and benefits. It's a unique employment category for research fellows, because then your employers of CSTE, CDC, SAMSA, or their host sites, it's a little confusing, but because of that the compensation is the same across the country no matter where you're placed.

In addition to the things listed here, there are other benefits that come up through it, so you also get funding to go to a subject area conference. Last year I went to SHEA, which is the Society for Hospital Epidemiology of America, and I got to present a poster there. Also I got to go to CDC person training on healthcare associated infections. Also, for HAI fellows, we get training and get our exam fees covered to get certified in infection control. So, there are lots of other surprise benefits that come up during the fellowship.

So, I won't get into this too much, but as you see, we have graduated over, or we've had over 300 fellows enter the program. Each year has been about 30 fellows. As the program continues, CSTE has been looking for new funding opportunities. They work with CDC, as well as SAMSA as of last year, and they are also scoring new opportunities this year. So, here's just a breakdown of the different subject areas in which our fellows are placed throughout the country.

Here's an example of one of our fellows. Nate is class 13, and he's placed in Minnesota. Here's a short list of his projects, you can see, I believe he's environmental health, so these are some of the things he's working on. Virgie is an HAI fellow, she's placed in Arkansas, and you see she has some of her projects look drastically different, which is the great thing about the fellowship, you can really mold your projects to your personal interest and the needs of your host site. If we have time at the end I'll share some of my stories too, since Paula alluded to some of them, but I'll get some more about the fellowship.

So, to be eligible, all fellows, we need at least Master's trained, so you guys are in. You need a minimum course requirements are at four graduate level

epi courses, and one bio stats course. Those are the minimum requirements, successful applicants usually have much more than that. You also need to have an expressed interest in a long term career in applied epi, as well as strong analytic skills. Finally, fellows must be US citizens unfortunately, otherwise you do not ... Those who have permanent residency status are not eligible for the program.

So, if you're interesting in applying, please note you have to ... They're very strict about the eligibility, and so please make sure you meet all of the minimum requirements. As Paula mentioned, our fellowship application opens up on Monday. It's pretty extensive, so if you're interested, I encourage you to go check it out. Look at everything that it requires, and start gathering materials sooner rather than later. Should any dates change, information will be posted online on the CSTE Fellowship website. So, as I said, it's a pretty lengthy application. Here are the different components that you need. So, again it's really important to pay attention to detail, make sure you have everything, make sure you get all your documents ahead of time, because they need to be received by the January 13th deadline, and they get over 500 applications each year, so the program's not able to accept any late documents. That's not me, so don't get mad at me if that happens.

So, like I mentioned, there's a pretty large applicant pool, over 500 people each year, so it's a pretty rigorous application process. It goes through two stages of internal review at CSTE. An external review committee that independently scores and ranks the top 140 applicants, and then CSTE interviews approximately 35 to 50 candidates each year in person. Then if you get beyond that stage, then you get to talk to your specific host sites, and you submit your top three preferences for host sites, and then host sites submit their preferences, and CSTE will match them based upon that secret algorithm that they use to do that.

So, for more information you can go to cste.org and click right there to find our fellowships. If you have any questions about the fellowship, this is not me, this is Valerie Godson, she oversees all of the fellows. I don't think she sleeps, but she's great. She's surprisingly responsive. So, you can reach out to Valerie Goodson at CSTE. Then with that, I encourage you guy to come and talk to me and if you're not interested in the fellowship specifically, I'm placed here at a local health department, I can talk more about what it's like to do that, and maybe different opportunities you might be interested in. So, thank you.

Paula Amezola: Okay, so it's past 6:30, and I really was hoping that you could have one on one interaction with our students. The voyeurs have interaction with our students, and alumni. How many alumni do we have today? One, two? Two alumni, okay. I really hope that ... There are a lot of questions that our students have, and some of them came really late, and I hope that anybody that RSVP'd past the deadline, they did not receive the questions, so please make sure that you touch bases with them, and talk to them. I saw the RSVP list today, and I saw

new questions, and I just want to mention this is why they weren't answered.

So please, if each of the employers can please go to one of the tables outside. There's gonna be refreshments, and I just want to give one last round of applause to all our speakers for enduring DMV, and traffic, and Uber systems, and to thank them for coming today and giving up two hours of their time. Thank you. And please, I will be taking these handouts to the tables where the speakers are at. So, please make sure that you visit them.

[End of recorded material]