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Can you hear me? All right.

So let us go around the room and introduce ourselves and because we have people on webcast please use the microphone.

[Roll call]

So we should have some folks on the phone. Let me see if they are with us yet. Christina?

I am here.

And the children's healthcare of Atlanta.

Don are you on?

Dawn Goldman, chief scientific officer emeritus for healthcare group and health services research and epidemiologist at Boston Children's Hospital.

Monica? And Sandy Schwartz? Anybody else on the phone from NAC?

There may be people that are coming in and out like Mike might be joining us at some point. Okay. The first order of business is to approve the minutes from the July 26 to meeting. There is a copy in your folders and so I would just ask if there are any changes or edits and if not I would entertain a motion to approve.

I moved to approve the minutes.

2nd.

I 2nd.

All in favor. Any opposed?

They are approved. David, we just finished introductions. Would you mind introducing yourself?

I am David Atkins, I direct health services research at the Department of Veterans Affairs here in DC.

Welcome. I will now turn it to go Paul for the directors update.

Thank you all of you. Welcome to AHRQ. I appreciate you being here and your engagement with us in the time you give us. I appreciate and I also know that all my colleagues at AHRQ really appreciate that . I have been here for a few months now and it has been one of the most exciting things I've done in my life. And by the way I've done a lot of exciting initiatives. The reason I say that is because I believe AHRQ has some unique opportunities and the kind of people I'm working with and I believe that the opportunities that lie before us. So

I'm going to take a few minutes this morning to lay out my vision and part of it you may have seen in the blog that went out on October 17. I want you to know that vision that you read about was not something that just emerged in a vacuum. I've had a chance to visit with a lot of people, some of them are right here and others starting from a medical school students who graduated from George Washington University to recent scientists and CEOs of healthcare systems to nurses in the emergency departments and folks in the urgent care, practitioners, and I learned a lot. Today I want to share with you some of the emergences of those ideas which have also come because of tremendous engagement right here at AHRQ. We spent a lot of time and I learned a lot from them so what I will do is take a few minutes to present my vision and then I would like to engage you, my job is to listen to you and just be very short and sweet about what I see as the possibilities. I was thinking of having a rather long prepared presentation and speech. Maybe a part presentation so I'm going to just totally avoid that. I will talk from my heart so I am going to go there and be the artist that Lucy is.

I am not the artist.

What I see is a changing landscape. A landscape that's [Indiscernible - speaker too far from the microphone]. What I see is a grand challenge before us. The grand challenges how do we four for the better part of the last 20 years the healthcare system [Indiscernible - speaker too far from the microphone] it is becoming more complex every day because of factors at play. Because of economical and geopolitical four four [Indiscernible - speaker too far from the microphone].

It works now. What I see is that AHRQ has always had a place. Researchers always had a place but today as the environment is evolving providers, ACO's and on and on there's a lot of players. And even more so because people like the companies like Google's of the world, Amazons of the world, are figuring out how they can come in and disrupt the environment. Actually on September 14 I was at the meeting at NAM with [Indiscernible name], the CEO of S not that and he said Aetna will be a platform. It will not be an insurance company. We at our company see you on the board mentors and we had a conversation and I said I come from the insurance industry, one third have been has been in my -- how can an insurance company be a platform? Within four weeks at not get acquired $6 billion by CVS. We cannot imagine that. That's the kind of revolutionary change that's happening in the industry. So today AHRQ is a very important role , very important role. Evidence-based tools so we can research to practice and however, the question before us is what will AHRQ be? What will research look like? I have been thinking a lot about that. Talking to my colleagues about it so here is what I see. AHRQ has to do what we are doing today. That's going to change but we have to start imagining and seeing where the [Indiscernible] will be in that will be defined by the social economic geopolitical technological demographic changes that there is a tsunami coming. 18 million baby boomers will be retiring. 33 million are there, that's a large number will have to be taken care off. And we talk about safety issues, talk about hospital acquired infections, and if people are going to be taken care of in an environment where there is multifaceted approach is to care and it will be totally different. It requires the research to be totally different. What I'm saying is where the [Indiscernible] will be is the question before us. How do we get from here to where we need to be. That's the grand challenge. We have done a marvelous job at AHRQ over here but we are in a box and this is a bottomless world where we have to be super specialized in our space, deep in research, deep in practice but at the same time we are have to think horizontally and by the way within the digital age we live in, it's a bottomless world. It's a global world. There will be disruptions happening in our environment. Not just in Silicon Valley but from anywhere and everywhere. We talk about Internet of things, it's about Internet of everything. Having said that what does this all mean to us? You read my blog, this is to warm over here. The list for strategies be laid out after much deliberation and those for strategies let me go one by one. The first one -- these are the kind of flips I like to do. Just an example. The first strategy centers on the data. Enough has been said and written about it, I'm a data enthusiast, the volumes, variety, and the velocity with which it is coming it's transforming our space. Through research and everything within the ecosystem that in this by the way for me is ecosystem is what the issue is today. We are talking about the ecosystem. And I'm a systems guy, I'm thinking completely realistically. Data is one strategy and within data we set I went back and talked to my colleagues and said what are the core competencies and reset oh my God, we are sitting on data which is effective and is being used -- items from the private sector and trust me, not too many companies have the data capabilities and analytic capabilities we have here at AHRQ. Now are we fully utilizing it? Know. Because we have been strained. But that's not the question today. The question is what is going to be our data strategy? We have surveys, we add more data, we link and we

create information and insight. But today is it reputable and recognized? Similarly we have -- by the way June 26 last meeting you had a presentation of [Indiscernible] and today we are going to show you information on our platform. I call it platform because it has the power and the potential of being expanded horizontally. Today it has discharge information, inpatient, ambulatory care, and ED visits. It has the power of being expanded. So what does that do? It provides [Indiscernible] trends so they can look at the trends. But I believe if you can expand this we can change the power to the state this way. That's where the rubber meets the road. They need to understand what the trends are and I give you an example over here and how we can -- hurricane Irma and Harvey. Why can we go back and look at state data. From hurricane episodes and events in the past and predict the future and lo and behold they were able to do that. We are moving away from looking at the data and just a snapshot ensure of the past. Let's look into the future and see if we can predict analytical capabilities. We had AHRQ have that. We just have to build upon it. Strategy number 1. Strategy number two focuses on learning health systems. Over the last several months we've talked about learning health systems and AHRQ has an enormous amount of work. We went out to stakeholders Cullison, we need to focus on that. We all talk about the data, the vicious cycle of data and knowledge, practice and this vicious cycle keeps on going and helps the system. Lucy was at the last meeting on September 15 and some of you were there. It was a partial approach to [Indiscernible] what will the environment look like. By the way this is all practical stuff that I come from an operations background and at the end of the day you have to take ideas and implement them and make them a reality into the transformation. What we are looking at overhears taking the next step and the next step and we can go [Indiscernible] from the CEOs. [Indiscernible] systems all across the country. The third strategy pertains to a very different paradigm. Let's call it person pre-60. What we are doing over here is that for the better part of our research work, for the better part of the healthcare industry we've always seen the individual as healthcare paradigm. But we talked about it that social determinants, risk factors, external [Indiscernible] as a patient the person really needs to be at the center of other services. But you can go to the state and local level. I worked at the state level, a child is in distress, and they say that might be a child abuse situation that by the way in the year 2015 3 million [Indiscernible] across the United States were child abuse. So when the call comes in the investigator runs, 60 address, goes in does [Indiscernible] and by the way there are 60 programs in the health and human services side of the equation that impact the social behaviors or services relevant to the situation around that individual. So the investigator goes in, Mary Jo gets some information, it's not enough, goes to the healthcare system, and it takes three months before they have enough information. At the time can imagine what's happening? The child is going to the hospital system. We have to make the paradigm in the state and the local [Indiscernible] so our healthcare space is an ecosystem. Our research needs to have both healthcare and human services that and by the way I will go beyond that and I will say to be ready for this research has to be done in a multi-discipline manner. What that means is we have to look at the individual and say what are the other determinants. When we ask the question here is not just centered around a narrow deep view. It's both, it's all. So it's a horizontal view and we have to take a little less view over here and that bottle less view is because of data that changes the paradigm. So how does AHRQ fit into that? We at HHS the department has only made one of the recent shifts as going forward strategy is to put the people at the center of Health and Human Services. I challenge our community to think in terms of transdisciplinary research in the future. With you and other researchers help define that and create more steps so we can be the catalyst for change at AHRQ. Arc -- AHRQ has a unique opportunity because we are the only ones [Indiscernible] to the patient to primary care. And the individual may go to the emergency room for a bypass surgery. A person can go to the primary care doctor and say you need to go to neurologist. There is a malignant cancer the need to be taken out. The neurosurgeons comes into play at the go back to the primary care what I'm saying is that AHRQ ability to be the primary care physician centered to have the experience and do the research and the evidence, and all the due diligence in time to put methods and treated tools. We are extremely well-positioned in the entire HHS family. We can take the lead. The fourth when I call it -- I'm still trying to figure out what it should be called. Let's call it delivery to service. At the end of the day when the researcher looks at a question and they're looking for a question to be answered because they are curious as to why a certain condition happens, is it effective, is it efficient, can there be -- is it approved for their coming up with practices. What they're doing is they're basically doing research to evidence to doing whatever test needs to be done to prove their logic. They come up with the tools and the look at the simulation strategy, look at implementation strategy and however, at the same time the delivery system over here has different challenges. The gap over here is the last mile which is keeping up, that's the last mile challenge we have as an industry and in the ecosystem when you take a systemic view, we have to address this AHRQ is good at bringing it to here so what are strategy? We want to go out and talk to CEOs and delivery

systems small and large and engaged him and say I we have a going out and spoken to somebody? We need the research over here and has to be operationalized. We have to change the conversation. The narrative has to change. If safety process and procedures that have been invented over here or defined in terms of tools and whatever it might be, if it's not operationalized, it's not good enough. I think it was June, I was at a [Indiscernible] meeting and am trying to remember the name of the gentleman who came from I think Tennessee. He started talking about [Indiscernible] that has unique continues design. That's where the [Indiscernible] will be. We at AHRQ are extremely well-positioned once again because this is our expertise. Now I know that there is a huge transformational strategy we have to think about because you have to keep the team running but at the same time they need to be [Indiscernible] the American people in the future. My job was to finish this in about 15 minutes. I have taken 12 minutes. I will now open the floor for conversation because you need to ask you is are rethinking right? Our goal at AHRQ has been to put everything in the same of our core competencies that we don't want to become something that others are. We don't want to compete. We want to accentuate what we are good at and the same time serve the American people. So the question before me is are we addressing -- is the approach right? Is in a right direction? What the conversation should be be having with our stakeholders when we go out. What would you suggest to us? What I would propose is something I learned that works extremely well on September 15 when we had a summit was co-creation. I would like to open the floor and just listen to you and maybe I will invite Pam and David to come and help us take notes so we are really co-creating with your ideas with what I want to walk away with. How do we operationalize these ideas?

Thank you so very much.

Thank you very much. Obviously AHRQ has to be thoughtful about our positions its resources and many of us in the field have looked over the years to AHRQ to be the basis of advancing our methods and the tools we use to advance healthcare and you mentioned it limitation science and the how of care not just the what of care and the NIH spends a lot of money on the what of care but you're right that we have to get to the house of one of the things that I would like to see AHRQ be able to have strongly in its portfolio is to leverage is advancing these methods and limitations. If you think back 30 years ago and clinical immunology was unfolding there was a lot of methods to advance of we did not know how to measure quality of life. We did not know all the differences. And then around the same time medical decision-making methods were unfolding but where almost in that era now in a limitation find where there is much we don't know. We don't know how to measure or we don't have the right variables and every what that we discover will not be implemented properly so we will never get to the opportunity that we could in healthcare unless we get to this so some part of AHRQ and we have made advances in that, and partnering with delivery systems and I consider CMS to be one of those delivery systems where the there and all the other major delivery systems really want to get to the answer about how to improve care but might not be able to invest in advancing the methods about how to do that. Somehow partnering with these other systems that once the answers but don't want to advance the methods and being the intellectual push behind investments, and the field in 15 or 20 years you might see where we have gotten. I would just have pushed for that to be part of the portfolio that

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Thank you. I was reflecting as I was listening to you on the trends. I've had a new position at Kaiser and one of the things I see it in our region there has been a lack of strategic -- the topics have been selected because they are aligned operationally so I think AHRQ stands in a unique position to think about not just aligning with the field but across HHS. And one of the areas I'm really interested in and it I've spent a lot of time working on it is around social determinants reported measures and we -- the science is very limited. So echoing what Bob said there's an opportunity for us to think and understand how to use these measures and which measures are the right measures. How do we set standards and what can we learn. Through the federally qualified community health centers HRSA has been collecting a lot of this information that we don't have a repository of the data we can understand modifications that one of the things I've seen in smaller studies I've done at Intermountain was the availability of social support as an effect modifier and a lot of these social determinants and we just have not done the science to know and understand when CMS came out with a conference of care for joint replacement and everybody is talking about the promise well, when should there be a therapeutic response? These are important questions and we know it's important to measure them but if you are not going to use the data in an effective way, we should not be burdening people by collecting it.

Thank you for sharing that vision. I am thinking about how is it that you would execute on an agenda such as this and for some extent we talked about one possibility. There is so much going on right now in innovation and primary care which is really really going to be dependent on figuring out how to integrate social determinants of health. Or Health and Human Services into some kind of pool which will be dependent on our capacity to build our science and information. Dependent on our capacity to curate evidence and say what's the best of what we know. That can tremendously accelerate changes in primary care contact and how is it that we deliver on that research delivery so I guess they thought might be to really capitalize on the patient centered medical home will CPC plus initiative which does have multi-stakeholders involved in this and it allows for alignment but it would force a real reckoning with the gaps around longitudinal assessment of impact, the gaps in it limitation science, the gap and actually meeting the needs of very complex people with health and human services. Anyway to me it seems a terrific opportunity and everybody is counting on it. The business community is counting on it, family caregivers are counting on it so.

You are seeing that there is a demand for it?

Oh, yes. Our assessment is there is a tremendous the men and I was thinking you have these dimensions and person 360 and delivering and getting research to the delivery that's done and so want to hear you have this really big effort going on right now that is at the starting point in trying to understand how we are going to refrain and redesign our primary care system. And you have partners I know this is beyond evaluation of the effort itself to would welcome the opportunity to figure out what are the big gaps and what are the big opportunities to develop knowledge and knowledge implementation.

Don Goldman? I think you have a question.

Thank you. That's great. I was going to make a comment about the use of the term implementation and dissemination which is the current federal language for how you implement what we think will work and how you disseminate it and the missing piece in there at least in the way the terms are used is how you actually scale up what you have implemented and learned in the learning healthcare system and we notice well because Kaiser Permanente they often say we do things extremely well somewhere but not everywhere. That's a huge problem. I would just share some lessons. We've been helping spy foundation to put together a plate book -- playbook for patients with complex health care needs. We find it quite difficult to find models that have been really steady -- studied thoroughly. I think all the models we found for that patient population is suffering and has a lot of needs and cost a lot of money. They were almost no trials, even using methods like step wedge or others are practical methods, they cannot find the kind of thing. We had to curate them and look on the website you will see an evidence table that points out the problem that secondly, almost none of those models had been tested beyond the place in which they originated so they had not even spread to a few places let alone nationally. So that was the second problem that the third problem was almost none of them dealt with equity or true population health and none of them had a really strong voice of families and patients. These were all issues. And finally something that resonates with the previous comment. How do we get the federal agencies, the private industry and insurers and academics to work together to share the information. In putting together this playbook, as it turned out it was relatively inefficient to find out what was being learned at CMMI so we could included in the playbook in a way that it would be credible we had a hard time getting private entities and I'm not going to point any fingers but large hospital supply chain organizations for example or large insurers to share the model that they are in fact consulting with members who pay them and often these models but not willing to put them in the public domain under the sponsorship of the foundation. These are some of the challenges and I really do think we have to work on a better transparency and find the best models and thinking about how we're going to determine how to scale them beyond their originator so they don't sit in these isolated pockets and everyone can benefit.

I was going to ask Don a question. How do you see AHRQ's role in achieving what you just articulated?

One way to do it -- there's two ways to think about it. One way is to be a clearinghouse that embraces the idea of public project partnerships and federal academic partnerships so that the grants that are given are not just disciplinary but also across and expect sharing of resources and ideas from private entities and the government so that academia can function more broadly and efficiently. And then I think funding research spread and scale

up. We have here at IH I a really terrific grant from [Indiscernible] to spread new best practices evidence-based practices on the preventing of bone infections after [Indiscernible] for hips and knees. And actually validated that the campaign approach for doing that through state health departments and improvement organizations reduce infections nationally. So that was a wonderful federal grant and it had sufficient funding to be able to partner with a good evaluator and ended up with several publications and there will be more. That was terrific. Terrific funding. Maybe there is some more for the organization to approaches and scale up. The other thing I mentioned run equity, and AHRQ is very generous of funding [Indiscernible] I read a paper some years ago that said don't just call us that you have a diverse population and your study show us how you're going to take the data that you're finding in your work and then remedy what you will inevitably see. Bake equity into the scoring brands and expect the folks who do research for AHRQ to address that important problem and I think Gopal, you said this is for the people and we mean certainly I know you Billy for all people regardless of who they are and where they live and whether they are poor or rich, black or white, Hispanic or Somali. That should be part of all the grant and ensure patient and not just shows you the diverse population you are studying.

Thank you so much for sharing your vision. I wanted to echo what Mary said about primary care and opportunities we have at AHRQ and helping us build community laboratories and some of the other initiative evidence now being currently happening. I have been really struck by the incredible vision by what primary care needs to be and dictation among all Americans and everyone. In the world about what they expect primary care to do and the gap between what we expect in the vision of primary care and what it could be and what it currently is. I would echo that there are so many organizations within government and also all over the country that are working and this space and AHRQ really has unique ability to facilitate centrally coordinate among CMS, HRSA and many of the NIH institutes as well as the national Academy of medicine. The last time they look at primary care seriously was over 20 years ago and thereby the selection -- direction in the future of our medical care system our healthcare system and our help so I do think it's AHRQ's role to continue to build on the great work you have done in that space and help us build a laboratory to transform primary healthcare to be division we wanted to be and to meet all of our expectations stop there's a lot of work to be done.

Jose'?

Thank you so much for your presentation. I just want to make a couple of comments about this issue but social determinants because I think anybody who is in this general field of either health or healthcare believes that social determinants in terms of their importance trumps healthcare. And it's really one of the fundamental drivers within our country. And relatively low ranking across indicators cross country. And yet my sense is that and I'm not sure that it might but my sense is that in policy discussions etc. it's never taken pretty seriously as an issue related to health. And it's interesting when people are talking about all of these issues, often the sort of concern about social determinants is relegated to the healthcare system. We talk about health systems taking in getting involved in a social determinants of course at this point patients are already sick and they suffered a lifetime of being impacted in the way in which they live in the context in which they live. I think that I have been thinking a couple of things. First is the opioid crisis is a perfect example of social determinants if you well. I know that opioid painkillers have been too widely available perhaps in all of these things but fundamentally it's affecting a certain class of person and a certain social economic and educational stratum would certain labor market opportunities so I wondered if given that it's gotten so much attention I wonder if it's an opportunity to help people, Americans, of talking about both policymakers and politicians but people in general to make them understand how it is that the way in which people make -- live shape leaves to detrimental health. And with regards to AHRQ I've never seen AHRQ heavily involved in the decision of social determinants and I'm wondering to what extent -- maybe they were but I've missed it if it happens. I wonder to what extent AHRQ would have within it mandate or mission to become more seriously involved in that realm. I know the answer to that but that would be one implication for arc -- AHRQ to think about. Those are my comments.

So what you're saying is that the opioid crisis offers a unique case study or use case for our 350 review.

I wonder whether -- given that it's gotten so much press and many Americans know that is going on, without in any way because the problem here is it can also be interpreted as blaming the victim but if it's a vehicle, very present in the press, very obvious, a vehicle for having people understand a certain set of circumstances lead to a

certain behavioral that hurt you and then somehow try to make it a broader message about how the way in which people live leads them to behaviors or not. Maybe it's just the impact of those conditions that end up with us being 37 in terms of life expectancy and Lord knows where we are in terms of infant mortality. Those things don't happen by accident and there not a failure of our healthcare system. But they are rather if you want to call them a failure, a failure of the way in which environments in which people grow up and live in the United States occurred. That's my sense and I think this could ever be relegated to the healthcare system. This cannot be fixed to the healthcare system. It's interesting and I'm sure many people around this table know that the UK for example, one example, takes this very seriously and they are indicators of sort of social determinants if you will. They track them on regular basis. And they track them for the purposes of their impact on health. Not for some other reason like we track the poverty rate and so forth. Anyway, those are my thoughts.

I just wanted to echo some of the comments about primary care and expand that a little bit. I applaud you for thinking about health not just healthcare. Because everything we are doing is branching out and all the work I've been doing over the last decade and a half, has really all roads lead back to primary care. If you are talking about shared decision-making and talking about prevention, we keep burdening primary care as the place where that happens and anytime you walk into primary care clinic, there like we cannot do one more thing. I think we have to think about new and better ways to do that so I would echo what Jen said, we need to revisit what is primary care and how do we best deliver that. The other piece and I will say that I'm a national policy counsel for AARP in order the things that come to my attention the last two or three years is the important role of informal caregivers in our society were completely ignored and I think it's really -- it's a real deficit that we have not looked at them. AARP did a survey in 2015 and they found that 47% of informal caregivers deliver nursing level services at home. If you think about productivity in healthcare one of the things we have done we have shortened length of stay we have moved procedures into outpatient settings that when I was in the University of Iowa there doing bone marrow transplant in the outpatient. Things that we would have never envisioned and tries to ignore that group of people who are providing services especially for women, who are dropping out of the workforce to care for parents and they lose their retirement income, I think that there's a lot of things to think about societally and now we are relying on that group of people to provide services and really keep that level of spending down.

I agree with all of these comments about focusing on health and social determinants in primary care. However, I think it's very important for AHRQ to be able to have a constituency that supports it and let people know what it's doing is different. We are not the CDC, we are not NIH and if you try to become the CDC they will try to write you out and say you are irrelevant because they are the CDC. The CDC I think believes is doing social determinants, that needs to be part of everything just like primary care and so on. But I would caution us to think about what is AHRQ's niche. Where are you going to get political support that your colleagues at NIH and CDC and other places feel like the VA, HRSA, they do that and we are not doing that and that's important because if they're not doing that no one is going to do that and we use that is important for our work. If you become too much overlap you can easily be written out and no one will care. In fact, they might even be happy because you are infringing any you're taking over -- they would like to take over some of your stuff. And HI are in the limitation science. I nothing that's what you need to do but I would be cautious if you're doing too many things into broad you become just a history of AHRQ itself is in its own survival. We just have to keep that in a clear vision.

I could not agree more that I think we have to become focused and not be with other groups that might be providing the services and that's when we have to be sure we do that and we will be coming back to you to make sure that that happened in the second thing you raise this having the constituency for support. That is critical and I would love to hear more about who are some of the stakeholders we should be talking to. And what should the commission strategy be as well. I would like to share more as we have this conversation today.

[Captioners Transitioning]

The [Indiscernible] for support is critical. I would love to hear more about stakeholders we should be talking too, and what should be the education strategy as well. I would like to hear more as we have the conversation today.

Christina?

Yes, I fund it fascinating. Thank you all for presenting this. It's my question around the issue of primary care, and I thank Mary for her wonderful comment. I think in terms as a practicing Nurse Practitioner and looking at [Indiscernible] research, how can we equip providers to handle some of the -- not even equip, but how can we harness or measure data around some of the new market realities? I saw a patient using [Indiscernible] which is a pediatric house call. Even though I'm in a pediatric home for poor population in Atlanta, there is other -- they can access healthcare through other venues that are reimbursable. It kind of undermines the whole concept about pediatric medical home where we can manage their care in a consistent, cohesive manner. I wonder if we thought as we talk about and looking at some of that data with primary care, looking at some of those -- I think of in terms of disruptive innovation that is really coming down the pike to handle where people do not have good access or do not have good choices, if we are even considering those.

Alice?

I just wanted to reiterate the focus and talk a little bit about the brand, building the brand Mark.I think we talked about it before and I remember with Sandy, the importance with once you lay out -- I am thrilled to be included in talking about the vision and how we focus, and then really, really build the brand. I think there is a way that as we are hearing about the opioid c risis, when you tap into thinking about health care and health delivery, and the focus on health, rather than, now, what do we do in more of a reaction? As you were talking, you are going to go after the [Indiscernible]. We are not going to chase it. Or do we need to go? As we think moving forward and I start to think of some of the -- we talked about obesity in the studies, and looking at obesity you see major companies going too other practices where it's people that were not obese there are obesity epidemic's following in the U.S. footsteps. If we can really think about that brand and also thinking about where we need to be going to keep our community as healthy as possible.

Thank you. Alice, a question and maybe it cannot be answered today. I would like for you to ponder and based on where the needs are, the unmet needs in the future, and as we prepare ourselves for the focus to flow through that need based upon a niche, what do you think would be our brand? What comes to my? CDC is very easy public health, N IH.

If we say let's use opioid epidemic as a case, where is AHRQ's role, not that it would embrace the opioid epidemic and do everything across the access of the opioid at the -- epidemic, but on one access various agencies and AHRQ is one of them and opioid is one of these problems, then where do they intersect so that you can use that opportunity too say -- and AHRQ has to be here because if you are going to solve this problem, here is a piece of this problem that is part of it, AHRQ is here to do that. Not that we can solve the whole thing but each is a piece. Whether it's obesity, primary care, opioid epidemic or so on, we had the key piece AHRQ has to play in advance. Every time one of these content areas come up we play on that. We say, here is a big problem. Here is where you need as you build your brand and your constituency. You have to decide what that piece is.

Jen?

I think I am echoing again what many people say. I have been struggling at our institution with primary care especially and health research, [Indiscernible] a social determinants. Many are crosscutting issues, the horizontal integrators. We have so many vertical silos that if AHRQ can somehow position themselves to be that integrator in some of these key issues, and what I struggle with -- one example, at our institution I am focusing on primary care and building community laboratories. I get told, it's in this funding stream for public health. It's in this funding stream for rural health. It's in this funding stream for women and children. It's right, it's everywhere and nowhere. Figuring out how to be that horizontal role and bridge that is one of the strengths that AHRQ has and can build on being a small Agency in comparison to NIH and others, that might help secure some of this uniqueness and play that unique role. Just thinking about creative ways to do that.

Very interesting.

Shari?

I have a couple of thoughts and I appreciate the [Indiscernible] and refreshing approach. [Indiscernible] is very interested in User-centered Design, going to the customer to ask what it is that they need is a fresh approach that I think is needed, but I would also say though that AHRQ has a very unique ability to go beyond what NIH does in that you have an opportunity to understand the behaviors of the system. We know that there are evidence supported recommendations that are not taken up, and it may be not taken up in a very diverse way w ith -- so, the question then becomes, why are we not doing what we know works? So being able to kind of wrap are arms around that can unveil some opportunities for intervention, but there, again, going back to your partners are to intervene, that is also critical. That is one thought. As part of the behaviors of the system, what kind of actions or evidences require for us at every level, me and my clinic, and a health system, what would take away those barriers too permit uptake of what we know works? I think that is one point I wanted to make. And what works for whom is another point. Your approach to developing robust predictive analytics, analytics that can then be used to inform practice behaviors, I think, it puts data into action in the hands of those who really need those tools, which brings me to my final point which is, in CMS we are greatly appreciative and as users of AHRQ's fine work, and we use it for quality improvement purposes; use the tools to drive down the events of harm across this country, so that partnership has really, really, really, worked well. There are also elements of CMS business case that are statutorily dependent on AHRQ. I think that is preventive services, as an example. The fact that the preventive services must follow the preventive service Task Force, and it's written in statute is a great need that is pretty foundational as far as business needs for AHRQ, so not to lose sight of what your customers really really need. Likewise for coverage determinations, for Part A and Part B services. AHRQ is a trusted Partner and a necessary part of defining what the questions are with clarity, and informing study design in a way that questions are answerable and policy can be built upon that work. I want to thank you for that work, as we are thinking about what your unique niche is, there is the future, but also the current need that will continue because it's in statute, so thank you.

Thanks, Shari. I am glad you mentioned that because over the last four weeks, we had our MEPS team step back and say, who are our customers? We spent time defining the customers, including CMS. We flipped back and say, okay, what kind of data can we access, link, and come back and provide value proposition? What kind of questions can we answer? What would be the ROI for the customer? I am glad you are saying that because it's music to my ears. I am sure there are members hear from our team that our experts in MEPS who are interested so, thank you.

I will play the role of timekeeper and say we still need to hear Sharon's presentation. I have -- David, Jose and Lucy, if you can be [Indiscernible] -- I just want to make sure that we don't. We will have an opportunity as we go through the day with other presentation to come back with a lot of things that are coming up and it's not your last chance to raise the issues. David?

Having been in Washington for 20 years, I picked up on Bob's comment. I think you have two issues to think about. What will know one else do that you need to do? But those may not be the things that are best for building a brand, so you probably need to do a combination of both. There are things that no one else will do related to the methods and serving as a check on the enthusiasm of the day. There will be lots of innovation in the system. There will be lots of people using data. They will not always use it well and not always be testing their innovations rigorously and AHRQ plays a role too make sure the science -- how we measure quality and how we measure how systems are functioning. And the plays a role in sort of looking at, nationally, is the needle going in the right direction? Is the enthusiasm about the quality and what's happening to quality and cost on a national or State-level? I think it's critical to continue to support that. That's not necessarily going to be the brand that makes people happy, especially in different administrations. I think the brand that is sort of unique is where the patient meets the health care system and thinking about the patient as the center of the health care system and what works and doesn't work. It as the system changes from the patient perspective, and thinking about how you can both be a Convener and a clearinghouse too help changes, things that actually work get up to scale. Then I will echo the last point that other people made is that space that is missing across all of the other funders is, how do you take something that works and actually get it delivered consistently? And that can either be a health system, a delivery system issue or a public health system issue, depending on how you frame it.

Is a?

Jen anticipated what I was going to say so I could be particularly crisp, I hope. This issue in your presentation, this issue of silos came up in two ways. First to talk about the need for into disciplinary a multidisciplinary research. The other was your description of the Child Welfare, or the abuse system, if you well, wherever it was that this happen. And of course, in a sense, that's actually what we're talking about with regard to AHRQ. I am sure everyone of those 16 agencies had a particular role that it needed to keep and it defended very strongly, because otherwise it might not have existed. In the real-world, that's certainly the real-world in which we live and in which we operate, and every observation about AHRQ having to have its own mission, and the thing that different about and it brand is completely accurate in the world as it is. But I grant -- but I guess the question then becomes at the margins, because we are living in a world where everybody talks about teams. Many of the technology companies that have these teams, and with regard to health care they are Team-Based Care. With research there is in research and so on and so for. One practical question would be, how can AHRQ do something or a number of things too try to break down silos in different institutions? How can it promote, for example, one of the things AHRQ does is fund research. How can it fund research to bring down silos? Within its walls, how can it try to break down silos to the extent that are there already? And outside its walls, in working with other institutions, how can you break down silos? Maybe the purpose has to be quite incremental, white marginal at times, perhaps, small. Picking about it in that way and heading in that direction may be [Indiscernible] thing.

So is what you are saying is we could use the mechanism and tools we have, i.e., plans, et cetera, and [Indiscernible] amongst the research community to take a more horizontal approach to be answered [Indiscernible] horizontal problem?

It seems to me that could be done, a very careful and directed sort of program announcement. That's how you can accomplish stuff for [Indiscernible]. Intramural he, it's about -- today.

Too follow on the comments about branding and differentiating AHRQ from others, I am the Chair for Committee of advocacy for public policy at [Indiscernible] health. My plea would be -- I sit around and listen to the comments about people making these comments about statutorily, we are charged with doing this and that. I need a three minute to five minute elevator speech. There is such confusion when I go and meet with people in the [Indiscernible], about is AHRQ any different than PCORI, [Indiscernible]? I think one of the ways in which AHRQ has not done a good job in the past is communicating effectively. However you choose to do it, in English, in common language, these are not scientists we are talking too.

Okay, so, hopefully, that was helpful, and I want to say, David, especially, for having brilliantly captured -- I was watching you and it's a real talent to listen and capture the thoughts so, David, Thank you. That will make sure that you captured the advice that you have gotten thus far. Without further ado, Sharon, I fear you may have to speak in triple time, but to you for the next part.

Thank you, very much. This was a really great discussion, and I hate to kind of cut it short, but now is the opportunity to really tell you what we have been doing since we met last. I think it kind of hearing your comments about what we have been doing, it would be really helpful to hear from you about more of t his, is this consistent with what you have been talking about, et cetera, but we like to give you a flavor of what we have been about. That is what I am going to do now. First on today's agenda, we just had the Director's vision. Now, I'm going to talk to you about the activities. We've got a number of sessions plan for further discussion. We want to talk to you about data and analytics too address emerging issues. This is on HCUP presentation about what HCUP is and some examples of work that we have been doing. We want to provide you with an update of where we are on the learning health system area. We have talked about that in a number of prior meetings, so we want to provide an update. Then over lunch we wanted to present to you what we presented at the Learning Health Systems Summit, was it last month, where we had folks talk about some of the key programs within AHRQ that we are calling exemplars of work in Learning Health Systems. You can learn more about some of those programs here and how we frame them in terms of learning Health Systems. Then we want to end with an

update on our patient safety learning l abs, which is yet another good example of moving in the direction of Learning Health Systems around patient safety. That is our day-to-day. First of all, I want to just give you an update on NAC member u pdates. We have a new CMS Ex Officio member in Kate Goodrich. Unfortunately, she was not able too be here today but will represent CMS in the future. I am hoping, Shari, you can continue to come because you are a great participant. As Beth mentioned, there are a number of folks whose terms are expiring and we will be very sad to see you go, but we will find ways to keep you engaged. As many of you know, AHRQ is under continuing resolution until December 8. That level is kind of the current budget level at $324 million. There is some talk of maybe extension of NCR so we may not have a budget in December. We will let that play through. There is a house market $300 million and a Senate market $324 million, so that would be flatlined. They have slightly different priorities in them. The house expresses support for continued focus on evidence to improve quality and safety, accessibility and affordability of care. A problem with the house Mark is that it provides a certain Mark for health services research, but only earmarks a little less than $26 million for investigator-initiated research, which is problematic in that it would require us to end some continuation grants. We do not think that was intended, so we are with the appropriators on that, and hope that will be smoothed out in the final Bill. The Senate focuses on a strategy to enhance research to improve diagnosis in care. This is something we embarked on. It focuses on evidence-based practice, particularly on disabilities and chronic condition. It includes support for Health IT, I continue support for patient safety, and continued investment in invested [Indiscernible] research. Neither the house or the Senate directs AHRQ to be merged into NIH. In fact, both asked for a study to look at that further. Research Learning Health Systems, we had an invitational Summit, which was a different kind of meeting for us on September 15. It was an invitational meeting attended by 64 stakeholders, so, a small meeting a different. It was very interactive, and it was a great meeting. We have participants from the NAC there. I think when we have the presentation, more detail on this I think we're going to ask folks too talk about their experiences at the meeting. Next we have started blogging a lot more as a way of disseminating our research and data and activities. We have had 34 blog posts in 2017 so far. We have had a mixture of AHRQ senior staff, a lot of page views. You see some selected topics there. We would love to hear from you if you have read any of them, or if you think any of them are particularly compelling. Now, I'm going to talk about research and evidence. The USPSTF has been busy, as always, with a number of activities since the last meeting. The Evidence-based Practice Center's have just put out a systematic review on anxiety in children and a couple of methods reports. This is a much reduced set of activities from before, and this is really a function of the reduced budget that we had in this last year on this activity. The EPC program actually did put out a report on pharmacotherapy for childhood anxiety -- pharmacotherapy for childhood anxiety disorders, a PCOR [Indiscernible]. This is really interesting findings. We just released the initial version of our Company of Health Systems. We are very excited about that. As many of you are aware, we have a program compared of Health Systems program that is a combination of work by three grantees rad, BER -- R,E&D, BER and Dartmouth. We have a policy research and doing intramural research. This compendium was led by the intramural staff and Mathematica, but with input and assistance invaluable input and assistance from AHRQ grantees. This is the first publicly available database that identifies Health Systems in the United States and provides a snapshot of their characteristics. Some of the highlights, by the end of 2016, there were a little over 600 Health Systems, private Health Systems in the U.S., according to our definition. About 70% of nonfederal general acute care hospitals are part of Health Systems. Hospitals in these Health Systems account for the majority of hospital beds. Over 90% of discharges as well. Almost one-half of physicians are in these Health Systems. The majority of them serve high proportion of low-income patients. It's good news that the systems aren't only for the have but survey broad population. This was the very first release of the compendium. In the short-term, we put out a list of systems and owned components and a short list of attributes of the systems. Over the longer-term we hope to add to that with information on financial arrangements, information supports, learning and research, PCOR Dissemination, performance. A lot of this additional information will come from our grantees, and the information they are collecting, and we are also looking to external data sources to continue to add to this book I think this is a very exciting project, and we are very happy to have the initial public release. We have a couple of new funding announcement, but one I want to call to your attention we talked about in the past. We just announced a K12 Learning Health Systems mentored career development program. It's a partnership with PCORI. We will fund up to 10 training programs that will embed [Indiscernible] in Health Systems and provide training for the new generation of Health Systems. We have had very, very robust interest in this, a huge number of folks are interested and have expressed interest in applying. The FOA is still open. We cannot say very much about it, but we are very excited about the interest. Tools and Training-we had just pulled together a collection of

almost 250 tools and resources to help implement Medication-assisted treatment. This was done to support a number of grantees that are examining the how of how to provide Medication-assisted treatment in primary care, and to support these grantees, we pulled together all of these resources. This is available on our website. The tools are categorized by topic and address the full spectrum of needs for patients. We are very excited about this response to the opioid epidemic. We have also released a number of tools we had prepared after Hurricane Katrina in light of the more recent events. Those are up on our website now. We have two new Toolkits that we have just released. The first is a toolkit on falls prevention in hospitals, a training program for quality improvement professionals. Also one of pressure ulcer prevention in hospitals. A good feature of these Toolkits is there not prescriptive. They are not you must do ABC, but they are really working towards getting hospitals too implement a bundle of services in whatever way meets their needs best. We also have a new TeamSTEPPS app online training. We are really excited about that. I hope that this will serve to continue to expand TEAMSTEEPS use. We've released quality and disparities report. A couple of slides on that, as many of you know, quality varies across the U.S. You can see the gray areas where we have kind of lowest quality. The blue areas where we have highest quality is indicated. It continues to show some rather striking kind of geographic patterns. Although some gaps are getting smaller, disparities remain. I point your attention for black versus white, there are 77 measures that are worse for Blacks than whites. That is still a huge problem. We also show the people who identified hospital emergency or clinic as a source of ongoing care by residents location, Metropolitan, small Metropolitan, et cetera. You can see differences in patterns of there, and of course, you can see the disparities in folks who identify a source of ongoing care.I am trying to go really quickly. We continue to track, potentially, avoidable hospitalizations, and you can see on the left, the graph to the left that, locally, that has continued to go down, which is really nice. That by Metropolitan area. On the right, we show that tracked by race and still disparities, more than we would like. The quality and disparities reports offer State Snapshots. We have an online tool, and we continue to get a lot of use about those tools, a huge number of hits. I want to provide some examples of some maps data releases. We just put these out. We continue to track the percentage of private sector employees in establishments that offer health insurance. You can see it's pretty stable in large and medium establishments, but there has been a decline that has been a historical decline, even before the ACA in small establishments offering health insurance, although it seems to have leveled out between 2015 and 2016. Premiums continue to go up, but at a much slower rate, which is good news. Now, turning to HCUP, I am really scathing through this.

Amazing job.

Maybe at your leisure but we just put out an HCUP brief on the characteristics of homeless Emergency Department briefs -- visits, and we saw that teaching hospitals received more than three fourths of all emergency department visits by homeless individuals. Of course, as of interest as the homeless crisis continues to w orsen. We also looked at a common mental and substance abuse disorders among these ED Visit by homeless individuals, and as you can see, schizophrenia and other psychotic disorders is a huge percentage, mood disorders, alcohol-related disorders. You can see the different patterns by racial ethnic groups. Another recent HCUP brief was on breast reconstructions. We had found a very steep rise in breast reconstruction surgery after mastectomies. Interestingly, the sharpest rise was among elderly women. This doesn't mean that elderly women are having more, but they are just catching up to where the rest of the population was. As you can imagine, this got a lot of pick up in the local press. Back to today's agenda, I think I caught us up. I think I caught us up with this whirlwind tour.

I think we should give her a standing ovation.

I gave you my stark AHRQ elevator speech. It was kind of like watching those cards, when as kid you flipped cards and it gave you a motion picture. You shine a light on how will the healthcare systems functioning in terms of coverage usage, quality and spending. And provided tools that can help all stakeholders improve. That's what I heard.

I did write it down because I could not have remembered it. Thank you, Sharon. I am glad we had the hardcopy, because there was a tremendous amount of -- yes, my head is about to explode. A tremendous amount of detail

and it really great work. I think some of the areas that you touched on, we will have a chance to spend a little bit of time on throughout the day.

I'm happy to discuss any of those with you further, later during the break. And I certainly will put you in touch with the staff person that is responsible for the work as well. Thank you, very much.

Thank you, and thanks for helping us stay on schedule. For the next segment, which is on AHRQ data [Indiscernible] issues, I am delighted to introduce Jenese Nair and Pamela Owens. Jenny is Acting Director of division of healthcare delivery data measures in research. In this role she leads division development production and improvement in data and tools for research policy analysis and quality improvement. She is particularly involved with the HCUP and the AHRQ quality indicators program. And Pamela is a Senior Research Scientist in the Center for Delivery, Organization, and M arkets. Pamela is a great example of, she was at to five from 2001 to 2008, could not stay away and came back in 2012. I think that it's always a good sign when people come back. She is currently involved in the Design Management and dissemination of outpatient data for the HCUP project. Without further ado, I will turn it to the two of you.

I just said we could not let them stay away so we are really glad she came back.

I am Jenny Snare and will talk about HCUP. We talked about it in July but today our focus is going to be more on how HCUP can be a national information resource to support healthcare research and inform policy practice. I'm going to do a fairly beef background and I will try to give a little time back. Pam will then talk about several of our you sent -- recent uses of HCUP questions.

At a high level, what is HCUP? HCUP is a comprehensive set of publicly available All Payer healthcare data. It covers over 97% of the U.S. population, which means we have nearly the Universe of inpatient encounters in acute care community hospitals. It also then results in the largest collection of longitudinal hospital care data. -- hospital care data in the U.S. It includes multi-year inpatient and outpatient data based on hospital billing records. As you can see from this illustration, HCUP is more than the databases. We have online tools and research statistics and user support. I'm not going to focus on that so much today but on the core of the data. What is HCUP data briefly? Or is HCUP a project?

It includes inpatient emergency department and ambulatory surgery data. It is a census of discharges and visits, which means it allows robust analyses of common and uncommon conditions or procedures. We have multiple geographic levels for the data. We have national, regional, the census divisions. We have 48 states. We have some that are at the community level. From our State data, we create nationwide data, as samples from State data which I will talk about in a moment. It's also with the discharge-level. That allows us to produce information that can be linked. Over time it can provide links to geographical and other hospital data. We also have online query systems like HCUP net and HCUP fast Stats. We provide support by providing Clinical Classification software, or cost to charge ratios. And we provide technical assistance to users. Finally, be on building the data, we create statistic -- statistical briefs, of which Sharon just showed you two of them, homeless and breast reconstruction. And we also conduct research. One thing I wanted to highlight is what I think of or we think of as HCUP is a team effort. It takes a lot a work from a number of us. It's a completely voluntary partnership. We have agreements with 47 states and the District of Columbia too share data. From that data, we are able to create the multiple resources that I just described at a high level. But the Partnership I wanted to note is 25 years in the making. It's been a lot of relationship building and information sharing, and keeping on top of those conversations with our partners, because, really, they still on the data call the State level data they give us belongs to them. We are creating other data resources and products from their data. The nationwide or national database as we create our sampled across the statewide databases that we are using. We as a Memorandum of Agreement to categorize what is and is not allowed with that data. If you think about it, data partners represent the data gathers at hospital level. They have to carry forward whatever restrictions and agreements of they have for having the data or regulations at the State level protect gets the transferred to us. We negotiate a work together under the MOA. There only two mandatory requirements for data partners. They have to agree to participate in our national inpatient sample database, and to allow AHRQ to use the database research. This data is very sensitive and sharing it can often be of a major concern. I don't have to tell all of you that but a big part of

what we spend our time on is making sure that we have understood their restrictions, observing the restrictions, and preserving the confidentiality of the data. Lastly, I think the Partnership helps us to facilitate standards. Over the years we have helped work with partners and others to create standards, communicate those standards on race and that this of the. We did race and ethnicity codes with CDC. We also worked on Peer Coach with the national uniform billing community. We worked on [Indiscernible] admission codes and ICD-10-CM translation. We share what we learned, and our partners share with us. Intern, that comes back to us in their data over the years so that we have more robust data. This map shows you the states that participate in HCUP. The darkest purple blue shows the states that are able to give us all three types of data inpatient, emergency department and ambulatory surgery. In essence, we have collected all that is available too be collected and able too be released. The states of Alabama and Idaho do not have a statewide collection that we have been able to discover. Delaware has just elected not to participate so far, but we're hopeful we can include them in the future. We have 34 Emergency Department State partners, and we have 35 ambulatory surgery. Of these partners represent the data organization in the State that has the statewide collection, and the authority too release. One thing I wanted to mention is to give kudos to our partners. We are really leveraging their investments. They are making the investment in the collection of the data. We would not have a project like HCUP if we had to start from scratch of where they are coming from. I wanted to mention that and our appreciation for their contributions. Briefly, this will be familiar to all of you. As you know, when a patient enters the hospital, a billing record or discharge record is created. At some point, the hospital may add additional elements to the billing record. They send that to the data organization that is authorized in the State. It comes into HCUP and varying formats. It can be as simple as a paper record from a rural hospital or part of an EHR record. A big challenge for HCUP and responsibility is to standardize the data across all states so that we have a common set of data elements. That represents a pretty big challenge. It's tens of millions of records on an annual basis. I will not describe all of these because that would take us a while. There are seven types of databases that we release to researchers and the public under data use agreement. We have of the State inpatient databases State inpatient database, which is inpatient hospital discharge data, including those admissions that start in the ED. We have the State emergency database, SEDD and S AASLD, State inventory surgery and services databases. These are drawn as a sample across State databases. The NIS, national patient safety -- some of that may be most familiar is a sample of discharge records from all hospitals that participate in HCUP. It contains data on all patient type admissions including ED. I also want to mention nationwide readmissions database, which For Fun we call the nerd. This is pretty unique to our project and what is available. It's a database of all payer hospital inpatient stays that can be used to examine national estimates we're readmissions. We are able to do this with 21 State partners' product have the data elements that allow us to track a patient over a year and the hospital. We have one more nationwide database that has not yet been released to the public we are beginning to work with ourselves. We created a nationwide ambulatory surgery database. We're going to try to start using that internally before we are able to release that to the public. Are we doing okay on time? Okay.

I have been focusing a bit on unique advantages, and I'm going to highlight a little bit here. Because of the standardized data, we are able to facilitate multistate research and across a comparisons. When someone uses HCUP databases, they can look across. The data from Hawaii can be compared to Mississippi, Florida, Texas or the New York. That allows enormous about the research to be conducted. As an example of the size of the data, we have in an annual period over 4400 hospitals in the databases, over 33 million hospital stays, over 77 million ED visits, and over 8 million ambulatory surgery visits. We also have one-stop shopping. Years ago, we developed will be called a central distributor, which is a simple dissemination method. We are able to facilitate researchers access to the data and also decrease the burden on partners by represented the partners and creating one resource for researchers to come in. Instead of having to file multiple data applications and data use agreements, and find out all of the procedures, we have accommodated application. We review the requests. It's all centralized to us, and I will also mention that the sale of the State databases, those funds go back to the State because it is really representing their data there. The national databases are also In the Central distributor, and right now, HCUP is the only current source of national inpatient statistics. I also wanted to mention, because we're pretty proud of this, as of the end of last Calendar Year, we have distributed over 52,000 databases cumulatively over the central distributor. I just looked it up and last month the logo we distributed over 600 databases, a combination of State and national databases. That gives you some sense of the use and the pickup of the data. Another really important advantage of HCUP is it's the only source of all payer data. We have the uninsured and Medicare Advantage patients. And because of all of these r easons, HCUP is able to support

research on nearly unlimited t opics. Several of them are listed here common conditions career procedures, critical s ubpopulations, and we have demographic and clinical information such as age, sex, race, month of stay and revenue codes. We have expected payer of services, hospital and County identifiers, status of discharge upon release from the hospital. Those are a few of the highlights, but we also need to acknowledge that hospital billing data has limitations as well as benefits. I will put a few up on the slide. While HCUP contains a large amount of records, there may be differences in the way that information is reported across hospitals. Although HCUP provides uniform coding, there is a lack of detailed cynical and revenue information. HCUP is easily accessible but does not include all hospitals. For example, we do not have the federal hospitals, Department of Defense, Indian Health Service, veterans administration. HCUP include information on all payers, but we're not able to capture the entire episode of care, especially in the primary care setting. If I know benefit I will mention is that if you are familiar with HCUP or our website that you know there are many tools and supplemental files we make available to researchers to facilitate their work. Activities to take to do our work, for example, development of cost to charge ratio. Once we develop that ability, we try to create that as a resource to put that out for others that are going to use the HCUP databases. That was a bit of a whirlwind. I think we are doing okay on time. Before turning this over Japan, want to see if anybody has any questions just about HCUP in general that we can answer.

Before -- before turning this over to Jen, I want to see if anybody has any questions.

The 52,000 data sets you have made available, are you taking what happens to them in the context of the research being produced, the analyses and so on, so you can give credit to AHRQ for making all of that happen?

The one way you we are able to track that is that quarterly we do publication searches. We keep a running list of all of the new research publications that we can see. Obviously, we try to keep track of other uses we hear about but that's really the primary way we are able to identify that. We put that on the website both to demonstrate how it's being used, and to inform others who may be looking for a resource about HCUP.

[Indiscernible - low audio]

Sorry, Pam is reminding may not only do we had to but we give our report to partners for feedback so they use for their needs to demonstrate the value of what they are contributing and how it's being used.

Yes?

Thank you so much. One of the great things about HCUP is the way it has expanded over the years with terms of new types of care and with more states. I'm wondering one of the things, at least got for many researchers would be extremely useful will be additional direction of expansion. That will be the ability, for example, to link these data, the hospitalization data, we're actually, any of them, but too national death Index. I wonder if that has been export explore? It has been explore. I assume it has not worked?

Not to date but does not mean it will not in the future. It is an Act of Congress.

That's great.

Thank you.

Yes, David?

A quick question.

And the NERD database, do you include observations day data?

Only observations inpatient admission. But in and of itself, know. We don't have a separate observation stay database. We have observations days in every State database.

Okay, thank you.

Chesley, your card is not cooperating.

You may have mentioned this but, can you link across the emergency room visits and the inpatient at the individual level?

The Emergency Department and billing record, or patients admitted to the hospital, it's rolled up into the same Bill, so, for that peace. For those states that provide person level identifiers, if they had an ED Visit, they were treated, transferred someplace else, or treated and released and went home, and then had a subsequent ED Visit followed by an inpatient stay. All of that you can see.

Okay, thank you.

David?

I am with the VA. I'm wondering the history of [Indiscernible] VA Hospital data. Is that you that is worth me trying to take up again?

We would love to take it up again. The conversations we have had in the past, I think, indicated the VA that they could not share the data at a level at which we would have information in HCUP, but we are glad to have that confirmation. I think it would be really helpful. Why don't we talk about it afterwards?

So the beauty and the vast utilization of this makes me wish that if we were building on a conversation that we had earlier, if AHRQ were able to develop new metrics for actually measuring system performance, to get out the how and not just the watch, because you are measuring all of the what that went on but not necessarily be cut you -- cultural and how but better metrics to understand the outcomes which are often influenced by the how than just the what. You can see how that ties together in both developing advancing metrics and able to disseminate [Indiscernible - low audio].

We agree. We're going to be starting a new scope of work on this contract next year. One of the areas we plan for is to be looking at measures of systems, things that we can include in HCUP. We are going to be beginning that starting next year, if all goes well.

Do you prefer to do it?

You can do it, that's fine, or I can reach over you.

I know where you are headed.

Too build on that, actually, one of the things too look at is linking HCUP data or combining HCUP data with data that is already in house and other places. For instance, the patient safety culture survey is being done. Is there a way to bring in that information be collected to what we have in HCUP, and thinking outside the box? Great suggestions. HCUP answers questions, building on the capacity, the unique capacities that Jenny talked about. [Indiscernible] cost cost of care, access to care and disparities, quality of care, readmissions, because we have patient-level identifiers. We have State identifiers. We can look at State variation. We have county level identifiers, so we can drill-down. The other part of that, speaking about social determinants of health is looking to link at the county level information to some of CDC social determinants of health databases. We can look at -- we can actually look at clinical detail from an ICD-10 ICD-9 to ICD-10 standpoint. We don't have labs and pharmacies, but we can look at quality of care, patient safety, and variation in clinical practice. We also have informational cost, which I mentioned a moment ago, as well as payer. We have not just Medicare fee-for-service data, we have Medicare fee-for-service and Medicare Advantage. Web private pay. We have [Indiscernible] ensure and we have Medicaid. HCUP has answered questions for a growing number of

stakeholders. Partners and elaborates across federal agencies and with our State a decision makers. For example, we provided input in terms of State decision-makers, because we have State collection, we provided input to State legislators on opioids days of they look at an acting PDMP programs. We are working with CDC to refine the definition of injury and Million Hearts, the cardiac conditions, as we transition into ICD-10-CM space. We provide hospitals and, the 24, you mentioned this to measure metrics and give [Indiscernible] State benchmarks for comparison. We collaborate with NIH on epidemiology and transmission dynamics of respiratory viruses. For this presentation though, we really wanted to draw on the conversation earlier this morning, pick up some of those themes, to provide a little more detail and three recent examples using HCUP. HCUP's ability to inform the transition from ICD-9-CM coding to ICD-10-CM, ICD-10-CM/PC is coding. I should stop here. Does anyone know what that is? International ninth revision content revision and [Indiscernible] procedure coding. It's used on administrative data bases to capture what is written in the medical record. We're also going to be taking a deeper look at the geographic variation in opioid-related inpatient and ED stays, going on HCUP's ability too drill-down to State and county level. Lastly, will look at HCUP's response to the departments ask for information on what are the projected health care needs in the affected areas after the h urricanes. Paul mentioned this -- Sharon also made to do. HCUP in -- HCUP AHRQ indicators has informed the ICD-10-CM PCS transition. As I was just say, the ICD-10 systems integral to understanding clinical detail of health service records. The clinical detail that's in health service records in a standardized way. On October 1, 2015, or FY20 16, the U.S. transition from ICD-9-CM coding system to ICD-10-CM PCS. ICD-10 offers many advantages, including increased specificity, but it also has a lot of challenges, and in some respects, is fundamentally different from ICD-9. This does have an impact on research. It has an impact on health care planning. It has an impact on quality improvement. And it has an impact on trending. Does to give you a bit of background, over the last decade, the HCUP team and AHRQ indicator team has Partner with coders and clinicians to extensively examine the ICD-10 code transition, using All Payer and Medicare fee-for-service data. We have worked and I'm going to talk a bit about the partnerships here. We have worked with the CMS ICD-10 interagency Committee that was across all of HHS. We worked with the ICD-10 coordination and maintenance Committee too look at what codes may need to be included as additional ICD-10 codes. We worked with our State partners to think about getting dual coded data so that we can look at this in more detail. We have also fed back to what we are learning in terms of ICD-10 does ICD-9 to ICD-10. We have done some empirical analyses, and we're going to continue to do that. We have created a resource page on HCUP U.S., which is listed up there. We highly recommend you use it for go to it if you are in that space. It is useful not only to HCUP, but actually to anybody using administrative data. Too demonstrate the impact, first, I'm going to start with the examples of patient safety indicators. This one on the far left is PSA nine, post-operative hemorrhage or hematoma rate. PSI 12, perioperative pulmonary ambulance or deep they told us. 13 is [Indiscernible]. Sepsis rate. These are [Indiscernible] and using fee-for-service their data. What we did and AHRQ QI is we looked at a great specificity of ICD-10. We said we wanted to capitalize on that. We don't necessarily want a record that we identified I nine to be identified in I-10 if it wasn't the same clinical construct we were trying to get that, but we're limited by ICD-9 not having enough detail. We went back to the drawing Board to find out what we were trying to get up. We did that as you can see. It perioperative hemorrhage or hematoma, you can see the observed rate drops quite a bit with increased specificity of ICD-10. That is not the case with post-operative sepsis right. Those are observed rate. The Risk Adjustment for ICD-10 for CMS will be available to CMS in December, but to others in the spring. Turning out to heart attacks and strokes, here, were partnering with CDC to look at the definition within Million Hearts for heart attacks and strokes in trying to see how ICD-10, we specified it versus ICD-9, and are we capturing the same thing? It looks like were doing pretty good for acute hemorrhagic stroke and acute but [Indiscernible] cerebral vascular disease. However, there may be something going on with acute myocardial infarction. You can see that bump up. We have a solid line to quarter 32015. That is the last of ICD-9 coding. We have a dashed line which is transition from ICD-9 to ICD-10. The line start up again and that's all I said he [Indiscernible] coding. The bottom two lines are fairly stable. The top two, there is a bump up and then he goes down for AMI. One could ask, are we seeing a problem with how we captured AMI? Is it actually something to do with how the coders are adapting because it then subsequently goes down. There is a lot going on with this transition. The last example I am going to bring up is the opioid-related stays. This was actually done by a project led by Kevin Heslin, who is sitting behind me. Yes, you are still here. This was looking at taking the explosion in number of opioid related codes. We went from 20 ICD-9 codes two one-to-one ICD-10 codes. What we wanted to see is, are we going to pick up similar estimates using all of these codes? What you find overall is a 14% increase in opioid stays. But want to break it down into the categories such as opioid abuse or adverse effects,

[Indiscernible], you see that the breakdown is slightly different. Adverse affects bumps up 61% of stays for adverse effects related to opioids, but a 20% decline in hospital stays related for opioid abuse. What does this mean for help? We got a lot going on. Or hospital stays going up? Or the going down? What's going on with this transition? A couple of things, you could say the increased number of codes say we are better able to detect it and not able to detect it before. Maybe it's a detection issue. Maybe there is a learning curve with coders. You can see for opioid abuse it's going up again. It's about knowing that the codes are available and to use them. At any rate, it is important when you talk about these issues to think about that we had this break. We had this transition from ICD-9 to ICD-10. When thinking about health care planning, you need to think of your capturing that information, and HCUP is able to do it because we have large data bases. We have both ICD-9 and ICD-10. We can break it down by quarter. We are doing that with our partners and looking at this in more detail. Our there any questions here?

I know, Sandy Schwartz, you had a question?

Are you on mute?

[Indiscernible - low audio]

I am stunned. I am worried. I think we should send someone out to check on them. In the meantime, Lucy?

This is fabulous. Is it correct in assuming that the HCUP data was not subjected to the SAMHSA [Indiscernible] of the substance abuse data, so you have the historical data which nobody else does?

For most states, actually.

There seems to be one or two that interpret the rules differently than the others and we have not really been able to sort that out yet.

[Indiscernible - low audio]

Sandy, you are back.

Can you hear me?

Yes.

[Indiscernible - low audio]

Sandy, can you mute the audio feed that is on year-end?

Does that's at year-end, and ask your question?

Just let me know when.

Go.

Sorry I could not be there but it has been a very interesting morning so far. What my thinking, my question has to do with is where HCUP is going or could go over the next day -- the next decade or so as the healthcare system transforms. And dramatic reductions and [Indiscernible] shifting care outside, not just searchable care. [Indiscernible] national organization this weekend his estimate was they did not do a lot of tertiary care but [Indiscernible] is 75% of what they do. Now, five to 10 years would do that as outpatients. The question is, now that it looks like the ambulatory surgery has been brought online, and the staff is getting -- beginning to get experience with that, I think, now would be a good time to have planning going on to deal with part of what [Indiscernible] suggested in trying to understand more of what's happening, and trying to be able to build in and

I think what Bob was getting at, the electronic systems to get a better understanding of the critical detail and the underlying thinking. Also being able to create a database over time that will not be limited by the geography of which service is provided, but will be able to look at the episode of care for the patient as a whole. This is going to be a massive effort. It's going to take multiple years to do, but I think that is where the healthcare systems going with changes in it's payment and other structural changes. I think it's important that we start doing some formal thinking, and the initial thinking is begin planning for this.

I think that's a good suggestion.

Turning now to the opioid crisis, and we did want to leave sufficient time for you to give input I will try to go a little more rapidly. Between 2005 and 2014, the national rate of opioid -related inpatient inpatient stays 64%, and the national rate of opioid-related ED Visit increased 99%. We see this increase for both sexes and all age groups. It's highest rates are among patients in urban and rural areas, depending on the State. For most states, highest rates were among patients residing in communities with lowest income communities. The results do vary by State. This is showing a map that aggregates of information we put out in five HCUP breeze. The map shows percentage change in population right in opioid-related inpatient stays by State. You can see that some states have had over 51% increase in their population rate of opioid-related stays. We also wanted to highlight for you that you can drill-down by State, and you can do it on the Web e asily. I thought I would pick -- I thought I would pick a couple of states for those of you who are represented here. I was show you the capacity. California, I think some of you are from California. We will look at -- let's look at payer -- let's look at all states first so you can see. I will pick another State to compare it too. I believe two of you are from Oregon. I'm going to click there. What you can see is the rate of opioid-related stays is going up in both California and in Oregon. Now, to show you, let's look at it by age for both California and Oregon. You can see that there is a large difference in terms of the variation by weight, one to 24 and Oregon is relatively stable, wife age 65 -- well age 65 plus has increased.

[Indiscernible - multiple speakers]

I agree with that. We're all sitting there trying to fix that. As I was practicing this, that is the one thing I checked is our axis the same. I apologize. Thank you for pointing that out. I wanted to show you another interesting thing is that we can look at it by payer. Again, we have an axis problem. You can see the differences by payer are quite impressive. The bottom proper one is the uninsured. You can see that it has gone down.It has gone down in 2014.

Amazing, I wonder why?

We just wanted you -- you can play around with this. It's on HCUP U.S. There are various things you can do. There are various paths you can take. You can do payer. You can do sex, community income, patient location.

-- you can do sects.

That fastest Stats. was developed and the brainchild of Anna licks Hauser, who is retiring at the end of this month. One of the things we wanted to open it up to questions. Do you want to open it up for opioids now or go through hurricanes first?

Let's finish hurricanes first.

We can talk about all crises together. We can talk about the impact of hurricane on the opioid crisis, is what I recommend.

That actually is a study. You all our getting to the point of what we want to, which is input in terms of what are additional opportunities for HCUP to inform each of these examples and more broadly? Lastly, we wanted to highlight an example using quarterly data to and using past information too project estimates one month

following disaster. Periodically, we get requests from the office of the Director of Health and Human Services. We had Hurricane Harvey in A ugust 2017 and Hurricane Irma in 2017. They asked us if there was information we can provide so that they would know how many people and what specialty to said, what medical resources might be needed? What might be the impact on hospital care? For certain populations disproportionately impacted? We were informed by the Assistant Secretary a preparedness and response that there were hurricanes in the past that sort of mirrored what happened with these two hurricanes. We had hurricane Ike, Category 4 in 2008 that hit Texas. And we have hurricane Wilma and hurricane Frances, category five and Category 4 in 2004 and 2005 that hit Florida. We used those estimates to project what happened -- what might happen one month following hurricane Harvey and Hurricane Irma. We used the quarterly data for each respective State. What we found was that hospital admissions were projected to increase 2% and the month following hurricane Harvey in Texas, but only 3% increase was expected in F lorida. This information, and that projected increase was by age and condition. This provided inside as to who should be sent down and for what, and I will explain. The first bar chart shows the 2% at the top, the projected 2% increase in total discharges. But it is disproportionately for asthma with 41% increase expected for hospital stays for asthma. You would want to respiratory Specialist down there. The next slide shows something similar where we are looking at the expected increase in the number of states for Florida by condition. Again got respiratory illnesses came to the top. It was also important for us to give information about what counties would be most effective. We created this map for the that showed them where they might most likely see the increase in hospital stays by patient County. That is what this shows. We asked them to focus those in very bright orange. That has the most stays of i ncrease.

Again, were asking you, what are some additional opportunities for HCUP to inform disaster preparedness?

OneMerck, sorry.

That's okay.

We talk to about unique aspects of HCUP, and HCUP can enhance 2.0, which you read about and seen. And the data platform. We can expand collection of data. We can combine data with other data sources. We can capitalize on partnerships, which Jenny will show you are HCUP partners. We can expand our outreach too states, and we can expand our predictive analytic capacity. But really, this is a short list. We would love your input in terms of additional opportunities.

Lucy?

I actually was funded by AHRQ during emergency preparedness work after 9/11. One of the things that we did was we did Annapolis the looked at the location of nursing homes, hospitals, public health departments, and after Hurricane Katrina -- we did a [Indiscernible].

We were the only Agency that link across all federal agencies. We brought all of our data from North Carolina and work in the Secretary Incident Command center. I would suggest that one of things you could do now is like all of that data.

I think this is fantastic.

I wonder, what are you doing to alert all of the agencies in the Federal Government or State governments about the capacity? If you are thinking of building stakeholders who are really now increasingly aware of what you are doing and contributing, I am wondering how messaging is getting out. I am not sure if [Indiscernible] reads the blogs so I am just asking, is there another really big broadcast opportunity to communicate what you are doing, and that you would be accessible to answer key questions and so on?

We have a long history of working with staff in each of the agencies, and we are continuing to do that. In fact, Jenny and I had a conversation yesterday about how requests we're exiting capacity at this point. We are having to triage them a bit given Staff Resources. [Indiscernible] has done a good job of talking with new leadership in each of the agencies about our capacity. We're kind of continuing staff-to-staff conversations. And

[Indiscernible] is tied to talk about capacity from a top-down level. I think the work we have been doing around projecting hurricane response is one of the examples that, we did this relatively quickly, and used as an opportunity too showcase what we could be doing. Those are the kind of things we are doing, but we are really open for any other suggestions about how we get the word out.

That's really cool. Thank you, very much. I have a question. You looked at her case that had hit Florida and Texas. Obviously you did that intentionally. I wonder if you have how idiosyncratic the particular State are and so forth, because of they are that's an issue. If they are not, I can imagine, there are so many hurricanes that hit every year and in different places. I can imagine building a more generalizable model that predicts sort of, more or less, obviously, with some margin of error, what's going to happen based on strength of hurricane, the rain it brings, for example, all of those things, as opposed to focusing on the particular State, because that really narrows or shrinks the number of hurricanes you had to work with, if you will. Anyway, that's one top. I had a question, just a question. It strikes me, and RECOE is not included in HCUP, right, and I wonder, it's not a State, but has anyone ever tried to include Puerto Rico in HCUP?

The last time we spoke with there was quite a few years ago. At that time, we were still recruiting. We still had State to recruit. Basically, we added a few as we could. DC was the first time we reached out passed a State Rick it took us almost three years to get them on board, but as a result of these conversations, it has come back on my list. I would like to really support t hat. I don't right now -- I don't know right now. They have to have a complete data collection, and we do not know what that looks like. It takes time to make that happen with a State that has never released data before. I think we should really start talking to them.

My final question is about methods. It depends on what work you are doing, of course, but there are a lot of researchers who said, we basically have to start over, ICD-10, we're starting over, and then -- is that the way you feel about this?

It's a good question. For some things, I think, it's okay. For C. difficile there is one ICD-9 code and one ICD-10 code and works very well. If you are interested in studying that, that works for other things, yes, you have to re-baseline. CMS made the decision in the hospital value-based purchasing program to rebased line their hospital performance scores. The baseline starts from IT and and then they have to look out, and not to cross ICD-9 with ICD-10-CM. For the most part you always include something that shows a distinction in the trend unless you have done the analysis too show that it's really a good match, to not report across a trend.

Do you want to address the first question on generalized [Indiscernible] and State factors in a arcade?

I think that's a fabulous idea.

And in fact, Pam and Kevin have been working in partnership with somebody in the office of the Assistant Secretary for preparedness and response. They been working to pull data together and develop such a model. Hopefully, we will get the funding internally to be able to do that, because, obviously, doing this development work could take additional resources above and beyond what we have. I think think we have tried to demonstrate the potential opportunity. I think there is interest in maybe supporting this going forward.

I would say going back to the theme of the morning, it's actually a partnership across several agencies, and the data that each of them have. Lucy cut to you're point, some of that data resides now with Sally Phillips down in [Indiscernible]. That is the Secretary in preparedness and response. Again, it's coming back.

I wanted to call out something we all struggle with. That is that we have the ability evidently to build the data sets and infrastructure. That could take all of our resources. We actually need the resources then to use it and apply it. If anyone has advocacy, strategies or clues how to balance those two buckets, much appreciated.

I would say I would put earthquakes on your future disasters to model, just from the great State of California, and Oregon, yes, that's what were expecting. We did not talk about fires, but the fires are one, but earthquakes are when not whether, and likely to have some similar kinds of devastation in terms of complete shutdown of

healthcare systems and the ability to get to them. It just might be an interesting other, and probably requiring some different kinds of -- and may have some similar Equifax. Anyway when I would put anticipatory really -- some similar affects. Anyway I would anticipatory really put it on your list.

Cool, all right. Thank you, so much. Very exciting.

[Applause]

Because you are show -- so Chetty, will cut your 15 minute break -- chatty, we will cut your 15 minute break to 10 minute break. We will be back at 11:10.

[The event is on break to reconvene at 11:10 a.m. Eastern]

[Captioners transitioning] [Captioner is ready and standing by]

So could we reassemble please? Apparently not.

Thanks for taking a shorter break. I'm pleased to introduce you Amy.

Thank you. We're excited to be able to report on the summit today for two reasons. One is it's really fun to play musical chairs and see everyone else's reaction from a different angle, but, two, we worked really long and hard over the course of a year to plan pan agenda and plan a meeting that is incredibly interactive and based on a model of cocreation with our attendees and stakeholders and we're excited to share the results. We have two goals. One is to give you a sense of how this meeting was structured. We had a very diverse attendee list that includes healthcare organizations both large and small as well as more established organizations like intermountain and Keyser but also others like Denver health. We had representation from professional medical societies like ABIM, the her college of surgeons, state level policy leaders and other federal stakeholders. So we had three main goals at the sumy. The first was to identify the aspects of learning healthcare delivery organizations and practices that are necessary to achieve better organizational performance objectives related to quality, safety, cost and the work force. Two, was to recognize the role of ad this des in -- attendees. We wanted all folks to recognize they play a role in this process and three, to explore how it can act as a catalyst and by this we're trying to get at concrete examples of work we could do to support delivery organizations in their eafort -- efforts. So this is the agenda for the day. The agenda was designed to give folks background that was necessary to arrive at the desired outcomes. We also gave folks prereading material in advance and we structured it to be as engaging as possible with two interview style panels, including two members. Thank you for that. This is followed by exercises to develop a shared purpose among all the attendees and a speed dating exercise to learn more about specific or exemplars that support systems and you'll hear about this over lunch. This is all followed by work to generate ideas. That we will also be reporting about in the presentation. To give you a flavor, we'll show you a short video clip.

It demonstrated its commitment to patient safety. They have engaged patients, so I think --

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I feel very passionate about it. There is no other agency in the U.S. that focuses so much on patient safety in the outpatient setting.

Our mission is to promoat healthcare. So it's incredibly important. They have been interested since the start.

They're measuring what happens in actual healthcare and how we know that a change in the rules is making a difference. For example, if we say we will not pay for people staying -- being readmitted to hospitals for a short period of time, does that make a difference. The answer is yes, it does. Some of the work that ARC has done on readmissions. [No audio]

We will have more video to share with you. So as I mentioned one of the outcomes was the development of a shared purpose. Our facilitatetor was Daniel wolfson. He asked attendees, what is the purpose of the ARC

collaborating with healthcare. Why are we doing this? So at first folks gathered and and developed their own. Then they worked together as a table. Eventually it was voted on as a group and some modifications with us. We arrived at this shared purpose. Collaboration with healthcare delivery ahrq will provide tools and training for learning health systems that can create can -- can generate use in best practices to improve patient care and health outcomes. So with that, I'd like to turn to our colleagues, Mary and Lucy to tell you a little bit about their panels and share some overall thoughts. I think Don had to jump off. If Don is here, he can make some reactions.

I had the good fortune to have a conversation with Mike McGinnis. We were reflecting, set the stage since the report had been produced. It was five years ago to the month of this summit and Mike Ames major comments were we made major progress, both in accelerating signs. He talked about the work in genomics in thinking will leadership, culture, incentives and reflecting on the attributes of other learning systems that have a lot to do with how we have or have not made an investment in the infrastructure needed to make this happen, so talking about, in some parts of the system we have plenty of really good data and in other parts we don't have good data or the fact that data is not a public or common good. Even when it's good, it's not for all. I talked a bit about our team's experience in attempting to move research into practice and health systems and communities throughout the country and described what I thought might be some of the lessons learned. The first I really highlighted was humility, that researchers really, really have to approach the work that they do in trying to help systems and communities effectively and implement evidence with a great deal of humility and recognizing that we don't have all the answers. We haven't tested our work out in all the context. People have a lot going for them, so it's a partnership that needs to be created, not just with the players in the community but all the stakeholders who need to be involved. Then we talk about some of the issues -- these are really questions that came from the audience, which is how do you get to what you describe as P360. That we really need to understand much more fully the whole experience of people longitudinally as they interact with all of the systems to get to that goal. We talked a lot, I think -- let me just think. Oh, I also stressed what our team has learned, which is it's not about how AHRQ can promote adoption of evidence, but rather that this new world and adaptation needs to be a huge part of our thinking. We've used the transitional care model across the country and 95% are adapting and making it theirs and we have to understand what that means and how it is they might be getting better care, better outcome than the original work of AHRQ. Those are some of the reflections. Let me reflect on the day for a meant and I will move on. It was the best opportunity. I mean, I'm pretty sure I walked away with, you need to take this on the road. You need to take what you're doing here, which was so beautifully presented to the stakeholders and the engagement of the team at AHRQ with all of the stakeholders. It was one of the most exciting days I've had and many of us spent a lot of time in D.C. in meetings to really think about bringing everyone together, engaging them in thinking about your future. The second part I would say is where you are today is at a tipping point. The kind of work you're describing is you're now really so positioned to get R to D, research to delivery. So this was a fabulous, fabulous experience and I think it needs to be bottled, shared because AHRQ will be the center piece of what we should be investing in in our society once everybody understands what you're doing.

That's a hard act to follow. [Laughter]

Kudos on the pick toral display. So I would thank you for inviting me to be included. I have the pleasure of being on a panel with Karen finestein and what we've been asked to talk about is what's the vision of a learning healthcare system and what does that meenlt Peter was talking from the John Hopkins experience and I was talking from the inner mountain collaborative experience and I would say that one of the reflections I had from that channel was we need to be really careful because what a learning healthcare system means for one person is different for the next. Not all healthcare delivery systems are poised to have the capacity to be a learning healthcare system at the level of a Mayo or intermountain. So we need to create a place at the table for everybody and one way to do that is not necessarily expect individual healthcare delivery systems whose margins are shrinking. , to embed research, so groups like the healthcare system, network, groups like the high value healthcare collaborative which are more private entities. Also, I mentioned on the pan necialtion the existing as set, the groups are linked together. So there are ways you can use that to leverage and understand what's happening. One of the things we did talk about a bit because when you contrast the intermountain with Hopkins, Peter and I were like we need to learn from each other. Intermountain had the infrastructure that Hopkins doesn't have but Hopkins has other advantages. So I think it's important for us to know and recognize there are these different configurations and some are really broad based and some are no the other thing we don't

know a lot about is what are the barriers for this to happen. So remember that a lot of these delivery systems, especially operating in the same market spaces are competitive. So when you think about the fact you're asking people to be transparent for the public good, there's also a cost to those systems for doing that. What are the ways in which we can do this and overcome the barriers and recognize what those barriers are. I think there's a lot to learn there that would really help us accelerate the process moving forward, especially on areas that we don't compete on. I can give you a good example. I was one of the board members for high value healthcare collaborative and I worked with providence for a long time. Now coming to Oregon, providence is a come pet -- competitor. I said to the leaders, there are certainly things we can collaborate on that are community wide problems like the opiod crisis, you know, like patient safety areas. These are things that really affect our community and the list goes on. I think thinking about what are the enAbe blears that AHRQ can identify and share problems. And it all comes back to strategic priorities. I think the extent to which you can align those things, there's room for progress. I think it was a hopeful meeting. Some of the things that came out in terms of the data issues were really important. You know, I think that there's a lot of hope and potential for this avenue and it's clearly something we can brand.

It was a really great meeting. Thank for recognizing it. I came to it with a feeling I always have. There's -- I think there's a real role for active facilitation. Yet, I always come with a degree because there's good a sillation and not good facilitation. This was good. It was not overbearing. It provided a structure for people to cocreate and have an active dialogue where differences come out. So that was fabulous and it's a mark of create preparation and creativity by the staff. One of the issues I thought we began to, lower is what do we mean by learning healthcare system. There is a lot of confusion about this. I thought the meeting began to get a grip on what we mean. One way to think about it that was explored is to consider it at three levels. The first is the national level and some of the collaboratives you mentioned, a way to get at that. How do multiple health systems, not just health systems but community health systems and other agents, combine their data.The FDA is an example of how we can use large data sets to find the post marketing trends. I think we will see that with efforts that will transform how we learn in both the rigorous research oriented way and in a way that looks for signals and trends and develops hypotheses that need to be tested. So that's a very promising area. [Captioners transitioning]

Will put in our priority list to get back to you. How do we get much more agile so that the data is gathered in a critical way ? Those are the 3 levels. And they all need to be addressed in a coherent way so we can live together as rapidly as possible. They met at this point I will turn to my colleagues.

As Jamie and others have mentioned, we have a tremendously knowledgeable and diverse group of stakeholders. And the knowledge is really hearing from them to promote health learning systems. This lays out what we heard from the participants in terms of how AHR can provide value. This was a very collaborative process. Everyone wrote down an idea on a note card and the notecards were passed around and voted on. The top ideas were flushed out further detail. To identify specifically what the proposal is, who might be a helpful partner to push that ideal for work, how we can evaluate the idea for success, and these ideas were voted on again. And these are the top 5 ideas as voted on by attendees. And I will point out, the staff participants were able to generate an initial idea but did not participate in the voting. I will go into each of these and subsequent slides. I will point out that the 1st one has 8 management aspect in terms of selling the idea to management. Ideas 2-4 talk about promoting the idea in organizations and helping them best share information and implement best practices. In the 5th idea is around measurement. Of the top ideas, this was voted on by 42 stakeholders which is over two thirds of the audience. That is giving you an idea of how much people wanted to see this idea pushed forward. The largest challenge that people kept raising with that, executive in an organization that not see the business case. They want to know why they should invest their resources and helping to build a learning healthcare organization. The top idea was to help build best business case for investing and learning healthcare systems. The proposals were to help learning health systems. As Don engine we need to learn what is learning mount -- health systems. We have to quantify the return and investment. And then help develop tools to disseminate and pitch becoming a learning health system to executives in an organization who are able to make the decisions.

The 2nd great idea was to help develop a guide to becoming a learning health system. This is an acknowledgment of the fact that care in the United States is now is based on the best available evidence. We

need a health organization to move that evidence into the practice and care that is delivered. With that, AHRQ should develop a guide to becoming a learning health system with practical tools and guidance for healthcare delivery organizations. And it needs to specify the essential components of a learning health system and a guide would be developed to help organizations implement and there would be tools to help with this as well. And we could measure success by tracking the number of organizations that are learning health system, and also looking at the level of maturity and organization has in terms of its degree of learning math -- -nes.

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there was hope that AHRQ could help develop this across learning health systems. There are a lot of options and decisions they have to make when they begin their journey with how to implement the evidence that is abundantly around them. So AHRQ should accelerate the spread of evidence-based practices for learning health systems across the country. AHRQ should define what constitutes best practices. And help disseminate best practices. They could evaluate this effort by looking at the number of organizations that contribute and use this information as well as looking at measures of impact within an organization in terms of outcome that is related to quality, cost, etc. Finally it was acknowledged that technology is a major hindrance in learning health systems. There is not one focus or platform for sharing innovation. So a role for AHRQ could to be help to build a common platform. This should accelerate the sharing of data tools and resources, this would require working in partnership with stakeholders in the space such as HL-7 was mentioned. Obviously there are others as well. This will require defining learning health elements to be included. So we would like to work collaboratively with stakeholders to help identify what some of these elements are. We can measure the success of this by taking a look at demonstrated youth cases and documented adoption of a common data platform. So now, to move on to something a little different.

This idea is around supporting improvements and outcomes that are important to patients. Obviously, patients are at the center of what we do. So the suggestion here was that AHRQ should work to report the patient reported outcomes and measures to support the measurability of learning health systems. The thought here is that we could convene key stakeholders around using these measures and practice and support research on making this measurement more useful in the field and also for patients and clinicians. There is a lot of talk about measurement burden and we want to make sure that the measures we have are useful to us. And then, we can support pilots of these measures and learning health systems.

In terms of next steps. Since the summit, we have been busy looking at all that we have learned. Yesterday we sent out a message to all participants at the meeting. We shared an executive summary that pull together a lot of what we heard and a lot of what we have gone through here today. We also updated our website. There is a page dedicated to the summit that shares the learning and provides additional resources. We have begun planning how to develop the business case. It's important that we go out and talk to the CEOs about what is needed. With that, I will open it up for questions.

Thank you very much for your presentation. Let's assume that this is a good thing. It is possible in the real world that there would be a divergence between private return on investment, a return to the institution, and societal return on investment. That it would be really good for society. Obviously, when that happens, it is likely there will be a market failure. [laughter] I wonder if part of what could be done here, and another of the areas to work on would be thinking through what payment would have to look like in order to provide incentive for the development of learning healthcare systems ? This is one place where those incentives may actually work. They do not work well in general for clinical care, and that is for a lot of reasons but in investment system, they may work well, thinking through that, it needs to be part of what you're trying to do.

That is a great suggestion. Thoughts ?

We have been at this for a while at Vanderbilt. Addressing the issue of the business case, what we found is that our leadership is very engaged and willing to participate. We have started with some pragmatic clinical trials and build some infrastructure under which to address operational issues. It ended up being an expensive proposition for them that we were able to show them that they did not have to go with what they were planning to go with. Someone came out with a study that was not very good and thick, we need to switch to this expensive thing and that is what everyone in the country was doing. We thought we could study yet and we can study it by

randomizing everyone cheaply and we did not need to do that. And, we have just finished a study that those of us in medicine have been long before for 30 years. To begin normal saline ? And we just finished a randomized trial. So the ROI for our CEO is that we are saving money and we have evidence, and instead of everyone coming to the CEO all the time think we need to send back, his responses, let's study yet how are we going to learn if that really goes and we can turn to this process which is up and going. That is getting at a lot of what and not the how. But, what I was thinking about the proposition for the CEO, it is case studies. I did not see that here. We take case studies and say this is an example of what it is like. They have a hard time imagining how is my hospital going to look differently if I'm doing that versus how I am behaving right now. Some of the eerie is, -- some of the beer he is, I would try to articulate a vision. You want to get people to imagine what the future could be. It is about what it could look like and how it is different. What does it look like if you are clicking on all cylinders ? How do people behave differently ? So that they can imagine that, the Picasso real concrete example that they can say, I can see how that works. I would push hard on that.

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3 quick points. One is, I think it is important that as you are trying to incentivize the creation of learning healthcare system that there is a focus on the need to build infrastructure, not to think of it on a project by project basis. A lot of times when you are talking to the leaders they are making an investment think we need this project in that project. But what you need is a steady stream of funding so that you can be responsive and you can have those assets in place. The 2nd thing I would say is, I would encourage you as you are speaking to people, do not just talk to the CEO. In many cases, they are not the people that would be able to answer this fully. You may want to include some others like the CMO or someone who is the head of the search of an organization as well. And, the last point I would make is, as we think about establishing the maturity of the learning healthcare system, to be cognizant of the fact that it is a dynamic, that it is not a static status. You can have people leave, I am big about my own organization, where they are out of the learning healthcare system and it has fundamentally changed.

So, --

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this is amazing to hear. It's wonderful to see this evolved since the start of the conversation about what the learning healthcare system is and how to record highs it. I do have -- I agree with the recommendation to broaden who you are listening to. One thing we do know, a microcosm of knowledge is when it comes to doing something different that requires even a change in culture. That it is about leadership. And what the incentives are, they may not be financial, they may be referred, they may be leadership filing and buy-in. -- Leadership style and buy-in. Those are adopted because the leadership says, this is a cool idea not because they get paid more for it. That is an important recommendation. I also think, and to your point, there will not be a one size fits all. So, having the ability to see yourself and how it has worked in that it can work is important. It is not a matter of adopting the recipe. It is having the tool to build your own recipe but works for your system. In the last point I want to make is a question about sustainability. We are working to evolve the healthcare system to one that learns. And, I think of how we address learning. Because, I think that is a necessary part of sustaining what you have learned. So what thoughts are they are ? We have an emergency resident with us today and others who are in the training process, they have a different approach. And they will be from challenges that we do not know yet.

I thought it was a fantastic meeting. Picking up on Bob's point, one of the things about the learning healthcare system is more and more people have data, but the critical components are partly the culture of the idea that made the decision that should be informed by evidence. But, it is also applying evidence in your context. So, where I think we get confused is, some people think of a learning healthcare system is, we are a system that looks for evidence and implements. This is the evidence of what we should do and should implement it. But, what I always keep in my head is the cycle that the IOM has. It is applying the data that you have in your own contact. And in your system to see, does that evidence from a published study apply in my setting ? And how do I need to adopt and adapt it in my setting ? I think that is the piece that is missing usually. Everyone has systems that look at applying guidelines and point-of-care prompts. But, where we can help is, how do we help the people who are drowning in data to think about how to use it and not use it inappropriately ? I think a lot of places are identifying outliers based on small samples and spending a lot of effort responding to noise in the system. So, anything you can do and pulling out the need for, how do people use their own data appropriately

and efficiently and what are the tools and how do they avoid making mistakes ? And the last point is, people are great -- the VA and we recently looked at it. We have 2000 dashboard. We have looked at data for 20 years. You can produce a dashboard on anything. It is what do you do, it's like the light that goes off in your car. You have gone from green to red on your dashboard. Now, what do you do ? So trying to think about how to you link whatever signal you were getting from your data to something you can actually influence ?

Thank you David. I want to say, I cannot agree more. This is probably not going to be welcome. But I wonder if learning is the term we want to use ? I think it is about how we go from having the insight, what we do differently, the acting and the doing something and implementing in the healthcare system. Learning is great, but, we have a lot of examples Maxi I think learning is important in the sense that previously we talked about evidence-based healthcare, which means there is some truth out there and we are going to implement it. And I think the critical addition is you need to learn continuously because that term may not apply in your setting or the truth may have changed. And you can continually test and learn in your own data. But you are right, learning is not the end of it all. The learning is better than repeated discoveries. Which is what we do a time. So, anyway --

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I was going to try to go to lunch before. Are we ready to go to lunch now ?

Here is the proposed game plan. We are going to take 15 minutes for people to get lunch, or get [indiscernible] and munch. And then, we will, back and David Myers is going to have a world when exemplars opportunity. You do not want to miss that. So, let's go get food, photos and be back here as quickly as possible.

[Event is on a lunch break. Captioner standing by]

Are you ready for us to start ?

Know I'm not but I will.

I wanted to know if they had the Korean noodle munch ?

That is the best thing. She met it was really good.

Thank you everyone for doing that rapid fire acquisition of food. I am delighted to introduce Dave Myers. He is a fabulist [indiscernible] but he does other things. He is the chief medical officer for AHRQ and he has been a critical piece of strategic planning . And he is going to introduce us to a rapidfire exposure to some AHRQ exemplars prison at what we are hoping you will do now is eat slowly. But listen quickly. This is going to be rapidfire. And I want to put this in context. At the summit in September, we had a funnel approach. We started from the period of the health learning system that got down to some of the practicalities. And then, we wanted people in the afternoon to spend time coming up with those great examples that we saw. But to get them from the eerie and practice and thinking about what AHRQ can do, while we did have some NAC members, we had people who are very new to AHRQ . And will you start us off.

I am looking at Jamie could because she was strict about when to start. Thank you David and thank you to the AHRQ with the opportunity to speak with you. My name is Edwin Lomotan and I am here to tell you about CDS tonight. That sounds that make the stance for critical decision support. CDS connect is all about cutting edge digital infrastructure for sharing clinic my critical decision support and to advance evidence at the practice. The point I wanted to make is that this is as much about a digital platform as it is about the content. 2nd, CDS connect is a new program. We just began our 2nd year. And I am describing the prototype infrastructure for how learning healthcare systems can use this infrastructure now. Lastly, I want to ask you to think about CDS in broad terms. CDS is not an app or a widget. It is a process that used together people use technology to deliver the 5 rights of CDS, the right information to the right people using the right technology and the right format at the right time to improve the quality of care. At the in the day CDS can take the form of alert reminders and innovative forms such as dashboards, shared decision-making tools and the audience is not just physicians, it can

be other numbers of the care team. For learning health systems that are trying to advance evidence into practice, think of CDS as a suite of things to help them do that. And CDS connect as the digital infrastructure to support the process. CDS connect has 2 primary goals, one is to advance evidence into practice and the 2nd is to make CDS more shareable standards based and publicly available. As a proof of concept, we focused on cholesterol management we translated guidelines from the American heart Association around the use of statins for the primary prevention. We translated those into interoperable standards that we call artifacts. In our case we lamented this as a screen or tap the clinicians used in the EHR to help them have a conversation with their patients about their cardiovascular risk. And whether taking a statin was appropriate for them. The CDS that we developed is posted in a shareable form, ready for local implementation and adaptation and is publicly available. The idea is that if you are in healthcare practice, a learning health system or becoming one, and you are interested in improving the heart health of your patience and cholesterol management you do not have to start from scratch. If you are going to use your EHR to help facilitate. You could go to CDS and find resources or artifacts and guidance about how to use them. The part about guidance is an important one. CDS is not about plug and play widgets. It's about improving quality by knowing your staff and patients and where technology can help. So the CDS platform is about how it is developed, tested and implemented. We are exposing as much as we can about how we did what we did. Recruiting all the assumptions we made from going from guidelines to writing the computer code to what clinicians and patients saw during their visit on the computer screen. This will help others decide what is appropriate for their own setting and how much adaptation may be required for their own implementation. Another exciting part is the sponsoring tool. They are international standards that describe the language of clinical decision support and how it should be specified. We have built a tool so that others can use this CDS standard language to make it easier for others to use and reuse. Ultimately, the decision support will help practices and systems learn from each other. And put evidence into practice more efficiently.

Are there questions ?

The question should be quick.

We did that same think is probably 1000 other systems did across the country. How can people share what they have developed into the system ? Can it be bidirectional ? So that systems can go in and share if it is not a proprietary tool ?

There is meant to be up public infrastructure, we populated -- others can contribute it and share it. There is a repository and if you're planning to stick around for [indiscernible]. It is open source. We hope everyone reads it.

The other thing is this will help how you will share with you develop with the public ?

You are so clear, thank you.

Good afternoon. My name is Herbert Wong. I am happy to be here to describe to you the comparative health systems performance initiative. This contributes to the focus on learning health systems. When you hear the term health systems, the long-term health systems might come to mind. Kaiser and Intermountain health, both have a long tradition with a reputation for efficient, high quality healthcare. But what are the factors for this positive reputation ? How well do they perform ? Is there performance related to the fact that they are health systems ? Or other factors involved ? Over time, the number of health systems have increased significantly and today there are 600 health systems. The prevalence of health systems, surprisingly, we do not know much about them. For example, what is the difference in performance between these institutions and other institutions ? What health system characteristics are associated with their performance ? To high-performing health systems adopt patient centered outcomes research or PCOR findings ? What lessons can be learned ? Can they be applied with other systems ? These are the types of questions that this initiative seeks to understand, to answer and to spread. The main goal of this initiative is to identify, to classify, to compare health systems, all with the eye towards accelerating the dissemination of evidence that will improve the performance of the health system. To accomplish these goals, we partnered with several institutions, 1st, we are anchored by 3 grants that AHRQ has announced. These institutions are Dartmouth in partnership with Berkeley, the national Institute of economic

research and Penn State. We are also partnering with policy research to coordinate activities across 3 brands and disseminate findings. And trap with staff is contributing to this with research and data development activities. Using this team, this will take on 3 broad activities. 1st we will create and disseminate databases. To conduct research and analysis, we will disseminate these findings into evidence to promote the learning health systems. What are some of things we are now dealing ? A major project of this initiative is the compendium of US health systems bid a database that was developed that documents all the health systems in the US. Sharon mentioned this earlier during the AHRQ update. But just as a reminder the 1st release is made available in September , that identifies over 600 US health systems and we have 25 organizational attributes. This provides researchers, policymakers, and this gives a snapshot of the healthcare system. The compendium will be continuously updated with new information and a goal of the compendium is to foster greater understanding of the characteristics and practices of high-performing healthcare systems. In addition to this, there are 90 planned research topics that will produce the evidence that we hope to disseminate to improve delivery of healthcare in the US. These topics are quite varied. For example we have a set of research topics that investigate the role of health system integration and how that plays on quality calls. We have studies that look at how different management approaches care transition strategies and how that impact outcome. These are only some of the areas that we hope to gain an understanding and disseminate the findings. This initiative seeks to identify the characteristics of health system associated with better outcomes. We are identifying and comparing health systems all with an eye toward accelerating the dissemination of evidence that makes the system works better. At this initiative has a court feature of what AHRQ has been known for. We create and disseminate databases, we conduct research analysis, and we disseminate the findings. I am happy to take any questions.

Lucy ?

I have one comment. The comment is that NPR has an article coming out in November that will talk about some of the data issues and we will be interested in seeing, the 2nd thing, are any of the projects looking at the opportunity of the public/private collaboration with these systems ? Many of them are dependent on federal funding. 1st of all thank you for the comment. As I mentioned before there are a number of different projects. Many of the centers of excellence are in partnership. They are partnering with systems with understand the data issues. I would have to ask my team about the characterization that you have mentioned.

Is important to understand that the project is not about learning how systems work. Some will be learning, so will be looking at the definition of health systems. And hospitals affiliated with a certain number of physicians. So we have to come up with the definition of a health system and the evolution of the health system does not include the definition of whether there is learning going on right now.

I think it is an important attribute while you are collecting the data.

Desiccant observation thank you.

Health systems are evolving and consolidating and growing and getting bigger. And are at different points in their journey. The process itself is something to understand and learn about and study. So, how are you taking into consideration the evolution of these systems ? And how do you characterize that evolution so that when someone wonders what they learned they can find groups that are like them, and an important piece over the next 10 years, we will see this consolidation and how academic hospitals linked together because there will be systems that have more than one academic health system.

One of the key things we have recognizes that over the last several years, the explosion of health systems. And we go into a situation where we struggle. In fact, to -- to define what a health system is. We have a compendium based on the AHRQ definition that has incredible input from technical panels. One of the key features we are looking is is for the understanding of the component. The characteristics of the system including some element of where they are in the development process. For instance if we identify a handful of systems that are long-standing, they have been existing for many years. That is an important feature as we look at how the systems perform compared to another system that may have developed over the last 2 or 3 years. Some categorization or

understanding of the elevator Lucian process and where they are may be an important feature. I see Jamie raising her hand.

Good afternoon I and Therese Miller. We decide to tell you why AHRQ is a exemplary program to promote health learning system. This is a three-year initiative that featured over a decade of AHRQ work to support and study primary care transformation. It is our hope that evidence will create a blueprints to build a primary care system that delivers high quality and patient centered care for all Americans. Evidence has one of the largest studies of primary care. It features 1500 care providers. This includes helping practices implement evidence to improve the quality of heart healthcare, helping practices identify ways to build their capacity to identify and use evidence in other findings in the future. Studying how support helps primary care practices improve the way they work and lastly, building and disseminating a blueprint of what works to improve primary care. So what is evidence now ?

Please let me interrupt.

The competitive grant process. AHRQ funded 7 regional cooperatives fit each cooperative has recruited and engaged with a few hundred small to medium practices. There were unique interventions designed to improve the delivery of cardiovascular care focused on the AB C's. Aspirin use, blood pressure control, cholesterol manage and smoking sensation. That's max cessation. -- Sensation. These include practice facilitation, health information technology, data feedback and benchmarking. An expert consultation. Each cooperative is evaluating the success of their intervention in both changing primary care practice and including improving cardiovascular care. There is a team to study the innovation across all 7 cohorts.

[Captioners Transitioning] other practices have changed and need to reengage with quality work and find ways to [Inaudible] in practice. So why [Inaudible] evidence now is helping small to medium-size practices identify and use new evidence, evidence now is helping to build practices in other clinical areas after it ends. It is learning how to extract data from their EHR and is learning a lot about how to improve primary care.. We will be able to share primary care practices and they will be able to use their own data to improve the delivery of care. Clearly, the evidence now is helping to take this new knowledge and implemented in practice. Evidence now is learning how to support any large or medium size practice and become a [Inaudible] system. We will demonstrate that you do not have to be large or integrated and that even small offices can improve the care they deliver. Thank you. [Applause]

That was very nice, thank you

After you disengage to these folks go back to baseline?

We don't have plans to study but we are learning a lot about sustainability at the operative level and there are a lot of different potential models and we will certainly learn about how you may continue to provide external support to primary care practices. Thank you very much. [Applause]

Good afternoon I am delighted to have this opportunity to talk to you about arks safety program to improve the safety of healthcare. It is a critically important component and sustains a robust portfolio of implementation to prevent HAI. It was shown to be effective in over 100 ICUs in Michigan. We have had checklists and guidelines for ever and we are all aware that these guidelines are offered in the breach and moreover several analyses have estimated that the average time it takes for medical clearly translating evidence into practices is a significant challenge as well as a core component. Of learning health systems, in this challenging space the cusp emphasizes on safety, culture and [Inaudible]. It is a powerful tool for accelerating practices to prevent HAI's. ARCs -- in fact, success of the early cusp project help to transform the medical communities [Inaudible] of HAI's. They are now recognized as being largely preventable. The track record is gratifying and cusp has reduced centralized bloodstream infections by 41% in over 1000 ICUs and reduced urinary tract infections by 30% in nonhospital ICUs and reduced long-term cow -- care in nursing homes and reduced surgical site infections by 25-40%. Cusp is a prime example of ARCs leadership method. Thereby improve the safety and quality of care actually delivered to patients. The nationwide cusp project [Inaudible] includes the following.

Engagement of frontline conditions and senior leadership, education in science and safety, assessment of safety culture, expert coaching and technical assistance, data collection and feedback for performance monitoring and patient and family engagement. In addition, the projects developed toolkits encompassing all of the educational directives to extend the development past their duration. The cusp projects evidence-based [Inaudible] they clearly -- beyond this, the cusp project relate also to other arms of the health system and constitutes many learning health system the cusp project not only translates into practice but generates data and these data are then used to evaluate the impact of the intervention and modify for greater preventive is. The data and lessons learned from the projects are used to formulate additional questions and generate new knowledge. In summary, CUSP accelerates practice and improves the safety delivered to patients and the CUSP implementation project exemplified the characteristics of learning health systems. That is my story and I am sticking to it. I am glad to take questions. [Applause]

Very nice, a couple of questions. We are trying to understand ARCs role in this , are you running these or are you submitting RFPs for projects that roll in in the general area or do you have generated -- targeted work you would like to do? What is your role in that?

These are quality improvement projects not research. We put out a request and we put out a bid for people to [Inaudible] contractors called the action contractors who are ready to bid in quick fashion on projects like this. These are maintained by our sister center and action contracting mechanism. It then leads the project with our funding and our guidance. We are very involved in steering what is going on in the project. There is a intermediary group in one set of cases it was Johns Hopkins, they then have a whole set of subcontractors and experts that work with them, it is a very integrated set of people that do this. It is basically work for higher. We know what we want to accomplish and we are asking people to help us get there.

Thank you, that was very helpful, my second question is in the metaphor of personalized medication -- Medicaid. We are talking about the process of care, you mentioned you are trying to learn what processes and best practices work, at some point we might be able to describe hospitals or units that have certain characteristics and if they are in those characteristics, here are the processes and approaches that have been found to work when you are trying to address these problems. On this kind of unit, I have these kinds of characteristics and I am facing this kind of problem. What are the opportunities for me? Can you organize your information in this type of way to get better specificity -- specific details?

For example, a follow-up research project to our very successful project where you had a 41% reduction in the cause of infections in ICUs, you follow her research project and you find that several characteristics of the most successful ICUs helped the effectiveness of the intervention. Aggressive goalsetting was very helpful for that set of ICUs and interprofessional communication was also a very strong communicator -- indicator of if it would be successful. I wouldn't say that it was totally comprehensive. Are you asking a question?

She is waving goodbye.

Good afternoon I will be talking about the learning health system core competencies. We are going to start off with a imagination exercise. Imagine your daily commute, whether it is to the office with a clinic or here. You travel by car and there are probably many factors that were involved such as monitoring the road conditions, gas, running late etc. For some, like myself to make sure where the nearest coffee shop is. Now, imagine that if you are a researcher where point B is improving quality and health outcome. This involves developing, synthesizing and incorporating new evidence into practice. Pretty much attributes of the health system. Researchers in a learning health system can analyze system data, develop quality improvement strategies, testes strategies and refine them in real time. The challenge, however is that limited attention has been given to the unique attributes of these researchers as well as providing the adequate knowledge and skills. In order for these researchers to be successful in conducting this research, recognizing this need and challenge, AHRQ developed these 7 domains that were developed in focusing on these competencies. They are system science, understanding how things work in health systems. The second one is research questions make sure we are asking the right questions and the ability to evaluate the science, research methods know how to develop research in complex settings. Informatics, knowing how to use sources to conduct such resources. Ethics, ensuring that research is done the

right, ethical way. Implementation science, integrating the knowledge generated from the research at the point of care. Finally, engagement and leadership, employing the skills to employ a variety of stakeholders across the continuum and leading teams. There are about 33 competencies spread out over these 7 domain areas. It is not expected that any 1 person becomes a expert in any of these domains. However, if there is 1 I would love to get their autograph. As you know, learning health system research requires multiple disciplines to work together to produce and use system data to improve. Right now, AHRQ is at a pivotal point in research training. To focus on training the next generation of researchers and to help us to get to this point B. This is what researchers, clinicians and patients care about. As Sharon mentioned, we are very excited about working with the patient center out term research Center, PCORI for this training program. Information about this training is on our website and applications are due at the end of January. At this time, I am open for any comments or questions. Thank you. [Applause]

Thank you, that was very helpful, over the years we hear a lot about interprofessional communication, in this learning health care system it seems like among the competencies that we forget about are the ability to bring together these groups of people and function in a way we are not used to functioning. How to communicate, talk, and create a transdisciplinary solution we may need, is this part of your training? Are you going to conduct research so we will get better?

I think it is a little of both, what is unique about this is this is the first time we have these competencies available, especially through the research. There are a number of other competencies out there that will delve into those areas such as team work and team dynamics and science and so forth. At the beginning, as we go through and continue on just like making real-time improvements we will make and explore opportunities to engage in our competencies that we develop. We will look at how to improve or expand on these as we forward on this journey.

Are you thinking at all about how to create an evidence base around the importance of these competencies? Right now, as I understand it it is best thinking of what we think people need based on experience, is there any opportunity to provide information about the importance of it?

I think, as we move forward, we have information on our website and how we got to this point and the work that has been done. Through this training program that we have coming up, we have a learning collaborative that is going to be a key component of this. Through that, we will be able to develop and explore curriculum and ways that these competencies are working in this training program as well as opportunities to explore other things needed as we continue on through the training program.

What I am thinking of is demonstrating that if you have a team that has competencies, the odds that you will be able to make changes in the systems that those folks are involved in if you don't have the competencies available. It is really if you can demonstrate that you can produce the outcome of interest.

What is the critical mass that is needed?

Exactly.

[Indiscernible - speaker too far from microphone]

I'm sure you are ready to go on to the next session so I will be brief. I will be sharing with you some information on AHRQs capacities of improvement. We know that one competency of learning health system is the ability to embed evidence-based practices such as research from outside sources into the everyday provided. Learning healthcare systems also use internal data from the own experience to determine how healthcare is delivered in a continuous learning cycle. One of AHRQs core capacities that addresses this capacity of a learning system is developing and using evidence-based robust detriment tools to improve the quality and safety of healthcare. How does AHRQ do this? As a research organization we start with the science base for measurement , given the data source or data sources available we get billing data, patient experience and registry data as a fuel examples. We also know the attributes of a robust measure. We use the science to understand the data and then determine

robust measure with understanding of the methodology. 2 examples that I am going to talk to about of this approach are AHRQs quality indicators program and AHRQs healthcare providers and system. Quality indicators or Q eyes are standardized evidence-based measures of quality that can be used for the holiday -- hospital to track clinical performance. This will solicit important information from patients about their healthcare and put -- surveys are evidence-based design principles that are insured to provide the quality over time. The Q eyes and the surveys capture data that provide important insights based on different types of a healthcare system data. The Q eyes from data and willing AHRQs's measure are not limited to the data and measures alone it implements the measures appropriately and more importantly to use the results to improve the quality and safety delivered by the healthcare system for example healthcare systems can and do use AHRQs ability to track improvement over time. AHRQ has also developed a toolkit to help patients understand quality and safety in hospital. The toolkit also follows the improvement process which -- tracking progress and sustaining the improvements achieved. AHRQ has also developed the prevention quality indicators that have been used to examine areas in the community or expanded healthcare system. Moving to our other example, the surveys are used by healthcare system to measure an experience of care. The ambulatory improvement guide is a comprehensive died for health plans and medical groups seeking to improve employments -- performance. Organizational use of the guide can help to cultivate and environment that sustains improvement in patient centered care. The guide helps healthcare systems analyze the results of surveys and other forms of patient feedback. In order to identify strengths and weakness and strategies for performing -- improving performance. This includes a walk-through of a QI initiative. Efforts and strategy and improvement, finally, medical offices and group practices can voluntarily submit their results to one of the AHRQ databases for a customized report to facilitate results with other submitters. Thank you. [Applause] comments or questions?

[Inaudible]

The pain questions were changed and they are more focused on digital Dr. talk to you about expectations for pain management as opposed to others.

This is done on the phone can you hear me okay? I have some questions, one is do you have a sense of what organization -- organizations are doing with this to help them use the results?

Don, can you mute your computer because we are getting feedback.

Don could you repeat the question.

I was asking if these organizations could help understand the data do you have some sense of who is doing it and what they are learning as a result or do you have a plan to deal with the use of NLP or things that are not captured by the quantitative data.

Don you were at the learning health system Summit, were you? I think you asked the same question. [Laughter]

I didn't asked the one about the QI.

I am looking in the room for my colleagues to answer the question from the QIs perspective.

We used to try and track where they are being used in the past but it is really hard because these things are on our website and anybody can pull them down. We can reach out to states to find out which of our state partners know about use and we can talk to AJ's and others but this is something that is really hard to track because once we developed these measures we make them a public good and there is no way to track who is using them other than survey or you -- word of mouth. Frankly, we have made the decision that our resources are best used to develop new tools and resources and help them use them rather than to track the existing ones. It may not be the right decision but that is how we have decided to use our scarce resources.

I would say that is also true for the toolkit, the one thing we have that is not a comprehensive review is we have case studies on our website so either staff at AHRQ knows of a organization that is using our tools and had some except -- success or the grantee themselves says they did some great thing because they used the QI toolkit and then they turn them into case studies and then we have stories but not a overall evaluation.

Next session, thank you so much. [Applause]

I would say that I hope that you capitalize or continue to capitalize on putting this together because I think back to a point Bob made earlier about being able to tell the story about the contributions. I actually found myself wanting to organize them in some sort of a chronological order. I think there is a way to build a graphic that highlights the programs and shows where on the journey you are making a contribution. Then there is a chance for you to talk across what you are doing about how the pieces work together. I think you should take it on the road.

Okay, I am trying to get my game plan. We are turning now to an update on AHRQs safety learning labs and we have a panel with Jeff Brady which I think most of you have met previously. He is the director for the Center of quality improvement and patient safety and a senior advisor of patient safety at AHRQ and also the chief engineer for the Johns Hopkins university of physics laboratory. Very impressive. Jeff, I will let you introduce where you are going with this.

Can you hear me okay? Okay, we are overtime so we will try to make up some of that but it is a pleasure to be with you today to talk about this initiative that we started, not long ago. I was watching the early part of the session from my office via the web and I was pleased to hear the question about breaking down silos and encouraging the formation of interdisciplinary, horizontal teams to solve problems. The initiative we are going to describe to you today is doing exactly that. I think we are very much keeping with that theme that has come up a couple of times throughout the course of the day. Before we start I would like to acknowledge the small but mighty team, my co-presenter who is one of the senior scientists on the safety team and others that have allowed this to be the successful effort that it is. Essentially, what we are going to describe to today is a collection of 13 projects. These have been awarded in 2 cohorts starting in 2014 and then the second in 2015. At the heart of these projects are multiply this -- told -- multidisciplinary teams and a systems engineering methodology and design thinking is the approach to address related patient safety threats and develop solutions to appropriate for this methodology. I got some advice to give you some concrete advice to let you know the types of problems we are talking about. 1 is talking about [Inaudible] fatigue, you don't need to be a clinician to appreciate that, if you have ever visited someone you know about this issue and that is when you have to pull uncorrelated devices with independent alarms firing at different times. Some of those are false and some of those are true but it is left to the clinician who has many different tasks to complete to figure out which ones need to be paid attention to and which are just distractions. Imagine that system of things happening where they are not happening in a way that is conducive to safe care. Another example is thinking of the operating room and the risks that are present in that environment, this set of threats is conducive to this approach if you considered distractions from repeated interruptions. Not to mention the potential for higher infection risk because of doors opening etc. Considerations of the environment in the physical space. Another example is the domain of maternal and fetal health and the impact on safety on data displays that are supporting or not supporting effective care that clinicians are delivering. Is that information organized in a way that is easy to read? The team can't kind of see it and develop a shared mental model to see what is happening with the patient in this high intensity of care. Other aspects of the physical space is has the design kept up with practices? We will say a little bit more about that with the specific project we are addressing. That is, in a nut shell, a thumbnail of the projects we will talk about. Our agenda in the next few minutes is to give you a little deeper -- deeper rationale that do learning laboratories we will get you some highlights about these projects and -- that the grantees have faced and then we want to get your feedback on this novel set of work that we have embarked on a few years back so for some time now the field of patient safety and research has acknowledged the value of a systems approach to value problems. We have had reports that have called for closer engineering and healthcare partnerships to accelerate improvements and lower costs. In spite of that recognition these perspectives and methods have potential but there has been a scarcity of redesign in engineering activity. One key advantage of a systems approach is the potential to address a collective set of related problems and patient safety harms versus singular concerns in a piecemeal fashion.

Our objective with this set of work is to create opportunities for new ways of thinking and learning and for fresh approaches that can be revised when they were considered to be promising. More specifically we described what the title says, learning laboratories which are places and networks. These allow multidisciplinary teams to -- they can stretch their professional boundaries and engage in some bold design innovations and take advantage of a different approach then we may normally take in health services research. As I mentioned multidisciplinary teams are at the heart of the initiative, we set out in the funding opportunity and had a requirement for projects to include 2-4 closely related project areas which was a complete grant project, those needed to be conducive to the design approach so that the center and set of individuals would be more than just the individual projects themselves. Design thinking and system engineering methodology and finally we noted the need to focus on the high cost of care. Resourced communities in particular and we highlighted a particular interest in that.

Thank you, just to recap or underscore some of the essential aspects of the funding opportunity announcement that we think distinguishes features of learning laboratories. The slideshow shows 6 key features that are important and deserve some discussion. The idea of focusing on closely related rents to patient safety and when we put this requirement in here the settings of care that we were thinking about were those inpatient settings of care that are somewhat self-contained or easily defined as self-contained units. We would be thinking about the most easy examples to Inc. about which would be the ICU or the emergency department or labor and delivery unit. We thought we would be receiving applications in these areas but as Jeff just mentioned we were also interested in the ambulatory care environment and even though we had some doubts about if this methodology could be implemented in a meaningful way, we were fortunate enough to find 2 applications that came in on the ambulatory care side of healthcare. The idea for closely related threats is that for a systems approach to work, in these different settings, there is usually a cluster of harms that occur. If -- -- this would be the low hanging fruit for a systems engineering approach because they occur in a single unit and they need to be addressed from a system perspective to have a more synergistic impact other than thinking of patient safety as a number of one-off or singular studies. The second criteria or feature with that was unique is the use of multidisciplinary teams to generate-it -- innovative ideas with respective to threats. Multidisciplinary teams are not unique in any sense of the word, Healthcare Services, research, there are always multidisciplinary teams but I think it is important to make a distinction between what a multidisciplinary team might be an eight transdisciplinary team might be. When groups of professionals come together from different disciplines and start teamwork efforts it is probably just a diet -- justifiable to call them multidisciplinary they are different teams that come from different disciplines that are representing the point of view or the major paradigm that is prevalent in their discipline. They are offering their advice from their disciplines perspective. That is fine, if that's all it is then the term multidisciplinary team is probably appropriate. If we really want to become a transdisciplinary team or we hope that the teams eventually evolve into being transdisciplinary then we need to transcend the individual interest of our own disciplines or at least allow those interests to fade into the background and focus on the problem that the projects are trying to address. You lose -- -- if we are completely successful with our team building efforts so they do become team disciplinary we kind of lose our sense of identity as a clinician or engineer or as a human factors person. That becomes less important to have our own point of view heard but more important in terms of how our skills and knowledge can further the goals of the collective unit that is trying to address the problems in a more holistic fashion. We had a meeting maybe 10 days before the learning health systems such -- summit, we had our own summit of the patient safety learning labs in September. We asked the question about how difficult it was to work with people from different disciplines. A couple of grantees thought it was a major difficulty. They talked about how they really only started to talk to one another after the first 2 years of the project. That made our jaws drop a little bit in asking if that was a major accomplishment of 2 years of work, being comfortable enough to talk to each other? It was a learning lesson for us because when we write the program announcement we have our own vision of what is possible but that is only our own vision. That would be research as we imagine it and we are still at the 30,000 foot level so when you start to hear the clinical reality of what goes on in a clinical setting that is research as imagined does not equal research that has been performed. That is another one of our lessons learned and then the environments that are established, the learning laboratory is an environment where one is allowed to feel comfortable in coming up with prototypes of new designs this is where the design thinking comes in. We know that the private sector of the economy has made tremendous games in terms of this technique in terms of brainstorming and rapid prototyping. This is a place where individuals are allowed to fail. Failure is actually welcomed, the design mantra is fail early, fail often, succeed earlier. You want to try to try out these prototypes in the early stage of development where it is less costly to fail

rather than at a later stage of development and implementation or evaluation. This would be where your costs are already sunk and it is too late to make any sort of changes. Fail early, fail often at a early stage of design rather than much later during implementation. What goes on in between these two -- 2 phases is a lot of test revise iterations of the promising designs. This repeated testing that is going on and a lot of data are being generated but they are being generated in a rapid pace and extremely purposeful way so that these improvements can be made. The idea that Jeff was mentioning is there are 2-4 projects that are going on and eventually those projects should be identified -- identifying closely related harms. As a results of the design work that goes on, those, by the implementation stage, those designs should evolve or lose their individual identity as projects and become part of a working subsystem or working system that can be further developed and integrated and validated. It can then be tested in a simulated or clinical environment. That -- -- these 6 features define what patient safety learning lab is all about for us. Here is what works in industry and can we apply some of these techniques to patient safety? This is the system -- systems engineering process and Allen will be talking in a few moments about the V model. It usually starts out with concepts of operation and a extensive period of requirements analysis. In our FOA we refer to these 2 processes as problem analysis. One of the mistakes that engineering efforts make is they don't give sufficient attention to the problem analysis phase. They have the idea of a potential solution and they are so eager to put out the fire or get their idea implemented that they fail to look at the problems behind the problem they are addressing. It takes a fairly extensive period of time to unravel all of the problems that are contributing to the problem that you want to focus on. Is there anything else I want to elaborate on the whole idea is that even with Detroit and automobiles the cars we are going to be driving in 2020, the new cars we are going to be driving in 2023 are currently being prototyped today they, that car that we will be driving in 2023, is going through this type of design process. It starts out with some rough prototypes and high-level design and then the design becomes detail and there is a lot of revision and improvement and then there are small group trials and as those glitches are removed then we moved to large group trials. It takes more people to catch the finer vulnerabilities and then the different components of the system have to be integrated and that integration process has to be revised and approved before we push the car out the door. It has to go through a full dress rehearsal of all the integrated parts and functions together as a working system. This phase is where it might get tested in a wind tunnel or another simulated setting and then it can be adapted to the individual user or users in the clinical setting. This is the same thing I went through, the V Model that Allen will talk about a little bit more. The left side of the V shows the risk -- decomposition of the requirements that we want to have in the design and implementation. I referred to the further components that need to be developed and then they become integrated into a working system and all of those system components, as a working system, need to be validated and verified. That is where we put the left side is Humpty Dumpty falling off the wall and breaking into pieces and then we have to put Humpty Dumpty back together again in a integrated faction and that is the right side of the V. Just mentioned in 2014 we awarded the initial 5 grants and those are indicated in the gold stars. In 2015 money was made available to our surprise and happiness that somehow Congress wanted to see more of this. We were able to award another 8 grants and, right now, it has been a bicoastal effort. There is not a lot going on in South Dakota or Wyoming, it would be nice to get applications from those places though. We are going to look briefly at the first projects on this list for populations then we will turn it over to Alan who will go over further detail of what the Johns Hopkins lab is doing. Ambulatory care for at risk population there are three 3 projects, using electronic measures for patient safety notification and monitoring aspects of the care that is delivered. They are also interested in characterizing getting a better understanding of patient safety disparities. The second project is focused on population management on monitoring high risk conditions and treatments and here they are going to be conducting root cause analysis in 5 public ambulatory care settings to identify contributing factors to the patient safety gaps. They will be evaluating the impact of pilot implementation of patient safety monitoring methodologies that they are employing across the 5 ambulatory care settings. The third project is improving medication comprehension through plain language instruction. If you have any questions Barbara is with us today and I know she is assigned to this particular project. Here is what we were showing during our meeting last month. It is hard to make out and it looks messy but we asked the 13 labs to contribute to a poster board session. We did not want them feel to compel to develop a highly professional poster we wanted them to show us as best as they could through some slides what they were doing in their lap. Even though this looks messy it is a work in progress and these labs are reports of the way through their period of performance. Across the top, you see the 5 stages or phases of methodology that roughly approximate what the V Model in systems engineering is telling us to do. Starting with the problem analysis and going and to the design phase and going into the development, implementation and [Inaudible]

phase. Along the left-hand margin are the 3 projects we described, the test management, the at risk populations and instructions for medication safety for at risk populations. These were very useful to help us gain an understanding because we read things in progress reports once a year but it is good to be able to get a better sense of what is going on with these meetings. We were actually trying to start a learning network and we usually piggyback those on our annual conferences. Since our annual conferences were being changed or not held every year, it was difficult to do. This next slide is focusing on optimizing safety of mother and neonates. They have about 10 projects going and here are 5 of them that their presentation focused on. The first is developing a prototype of a maternal data display to better recognize signs of maternal clinical deterioration which typically evolves in a subtle, difficult to detect, fashion. How can we take advantage of enhanced visual techniques to recognize some of these signs? Another project they shared was the development and testing of multiple iterations of a floor mounted obstetric platform for delayed cord clamping; final prototype has been machined. The final prototype, they have put in for a provisional patent. Another project was conducting neonatal resuscitation's using new dated displays and the dated displays were designed to produce closer adherence to neonatal resuscitation guidelines. Another subgroup of their team is working on the design of a ideal delivery room after visiting 10 sites, they reported there was no standardized -- standardization of equipment and they seemed very chaotic so they undertook the process of trying to design an "ideal" delivery room. That is still a work in progress. Another effort they reported on was refining a prototype for a fetal neonatal transition suite using a data generated -- using data generated. This is a clamping table which is a new design for them, the underlying need for this is that it is important for the moms to spend up to 30 seconds to a minute with the court attached with her new child. It has to be done, if it is a C-section operation it has to be done in a sterile environment. This is a table or adjustable platform that allows that to happen. There is also a portable warmer that after that minute takes place and everything is insured that the baby is breathing normally that the blue pads can be put in the portable warmer and transported to the NICU. The Army -- amount of human factors and engineering that goes into labor and delivery unit, this is needed to ensure a safe labor and delivery unit. Something as small as a plastic dial with oxygen settings on it, if it is not set on the right level of oxygen it can lead to very harmful consequences for the neonates. It was small little things that you couldn't see from the indicator, the notch on the knob of the dial, on what setting it was. There are estimates to redesign that dial so you could see what the setting is when you are standing 3-4 feet away from it to make sure it is visible and everyone can see what the level of oxygen is that is being supplied. It is very important and a simple change can lead to hundreds and hundreds of lives saved. We are ready for Alan and I have asked Alan to share a little bit about what it is the applied physics lab does and how he made the transition from working on underwater warfare systems to ICUs.

Inc. you, before getting in to what you see listed here I will address some points here. I'm sure everyone here is familiar with [Inaudible] medicine it was founded in [Inaudible] to address wartime threat and over the years the vision has expanded to include national defense and security and space exploration. Of those areas, only probably the same -- space exploration gets any visibility. It was a planet when it was satellite launched that spacecraft was built and launched and manage the 9 your mission so I came from -- my -- -- I got swooped up into the defense world and ended up in a lab working on sonar systems for submarines. Long story, after 20 years of doing that I felt like I wanted to get back to what I was doing in the biomedical and health care field. Having watched sonar operators on submarines and surface ships and watching healthcare professionals do their job, there are a lot of similarities in the individuals doing heroics with devices and sometimes technology that does not lead -- meet their needs in the workflow. It is always interesting. Over the course of the last 8 or so years we have had the opportunity to work with Peter's team in applying a systems approach and the 3 projects I will talk about our -- will give you a better idea. I talk about systems approach, I talk about that a lot so what I thought I would do is take 2 slides to orient what our perspective is on those terms. We view the systems approach as being else upon 2 components one being systems thinking and also systems engineering. This is the system thinking component and as I'm going through the 3 projects that we are performing under this grant they may seem unrelated but they are purposely designed to be part of a system engineer to be highly reliable. That holistic view is essential to systems thinking and implicitly the systems approach. Each of these projects were recognized in the relationship along culture, workflow and technology. We start the concept of the program with scalability and it is inherent into the design. It is important and so is learning and accountability and we know there are many unknowns when we venture into something like this, we need to facilitate a process for learning and feeding back into future iterations. What we focused our collaboration on in the ICU is a area of high cost

and high risk and also high gain. The approach we are taking results in solutions that we think we can rescale outside of the care unit and outside of Hopkins, that is what our goal is, to address these more holistically. The other side of the systems approach coyness systems engineering. We refer to this as the system development lifecycle, I wanted to caution some of the language here when I say system development lifecycle it does not mean just technology we are talking system with a S. It is the whole solution in place. I dressed up the V diagram with some additional connotations to address the various act activities that go on as we evolve through this lifecycle. It starts in the upper left, when you gather a group of subject matter experts who are very well steeped in what the current state is and the problem you're trying to address, they can also help us think through what the future state should be. There is a process of developing what we call a process of operation where we baseline the current state and envision the current state. We decompose the holistic view down into its component on the left side of the V. We implement, design and finally working up the right side where we verify and validate the systems that we have we composed. Each of the activities on this V diagram have formal methods of processes that we follow but I will emphasize that those processes can be tailored. Not every project requires the same level of rigor in these areas as others. Another thing to emphasize is the importance of user involvement throughout the process, the presence, the voice and the end user. People that are affected by the solution that will be put in place, it is essential to take this into account as we progress through this lifecycle. What we have done is to refine and codify this approach as lifestyle care so that others can adopt it and scale it into their areas as well. Just a slide on each one of the projects, the first project focuses on harm free ICU, we are focused on a particular harm as a case study and we are drawing on a simplified 20 -- CONOPS figure and they represent a scalable model that we can use to apply to harms as sort of a beacon for our team to focus on or define the problem we are going to self that is agnostic to the solution. It helps us to understand the problem and do a great deal without jumping to conclusions about what will solve the problem. We spent a good deal -- deal of time trying to understand who the stakeholders are, what metrics are important and we understand what data is needed, what information is needed and word data and information design -- reside and how it needs to be communicated. Other aspects are regulatory concerns and policy issues that need to be factored in through the the CONOPS and I brought these to the service so we can codify them. We are using a tool called quality functional deployment were called QFT that was developed in the automobile industry and we are using a simulation workshop for trade-offs what we are doing with all of this is defining a CONOPS addressing higher reliability across not just the ICU but other care units as well. Second addresses productivity and errors that can happen in high risk administration. This particular case is focused on insulin delivery. You can see this illustrated graphically in the upper left with words on the upper right. This involves a nurse interacting with a medical record with a infusion pump and supplies and a number of different manuals and manual steps including manual dosing that has to be entered manually into the infusion pump the nurse also has to come validate the calculations that the first nurse has done and when that nurse is done with the validation they go back to doing what they were doing before. This happens on a recurring basis potentially hourly and the medications involved can happen for there are issues with productivity, inefficiencies and potential for error that exists in the current state the problem we are trying to address is to automate and eliminate the potential for error which you will see in the lower left and right we call what we have the smart calculator that pulls information out of the medical record and performs the calculation that the nurse would have been dunning by hand. Instead of bringing another nurse we are using a camp pewter and automation and validation in a companion approach. In the third project, we -- well most of our record to date is focused on safety errors that may occur at the patient level, we recognize the cause that exists between patient risk and use an -- unit risk. We are trying to capture a signal that says the unit is in stress and it could prevent harm. This is a loop diagram that identifies some of the data streams we are going to tap into. We are going to apply data streams in this dynamic model and it may help us put a palpable finger on the level of stress in the unit and how that might affect outcomes and safety. To wrap up this is a snapshot of some of our early findings we laid a basis for larger operational challenges in an operation approach and in project 2 we are looking at the bi-direction of communication and a medical record is a prototype that can be applied where other devices are involved. In project 3 we are capturing high-frequency data to determine error. A final take away is the importance of bringing together that transdisciplinary team.

Thank you, Alan, we appreciate that. I think my overall take away, in my own experience is addressing things that typically have been taken for granted. I think, throughout healthcare, things that are supposed to happen in the clinicians mind. I write the order and then it just happens, I think we know that it doesn't happen that way so if it seems like a very hyper deliberate process, I think you are hearing it very correctly. This is deconstruction

and very detailed looks at components of care and then putting them back together. We are sort of embarking on new ground, to some extent. Really quickly, because we want to get to your feedback on this, I think some take a wait challenges and lessons that we have from the set of work is building multidisciplinary teams are not easy. It takes a fair amount of time and different grantees commented on their own institutional bureaucracy. This was not always conducive to this type of work and in some cases it served as a impediment. It is helpful to document that to understand it in more detail. I think Alan touched on this, and appropriate flexible approach to the engineering application, we have seen that across the set of projects with some varied application. I think it is appropriate to the different sets of problems that each set is addressing. I think finally, the integration in the latter stages is more difficult than expected and this is new methodology and our stewardship of the projects was new. In spite of those challenges, I think with some slow, initial project -- progress we have been impressed with the results and the stage we are at now. We were happy to see some cross project learning and a real desire for that, as well. With that, I think the questions that we wanted to engage you about -- -- let me open this part of the session to say that you have heard of the status of our appropriations, the budget process for fiscal year 2018, our current fiscal year is ongoing. I wanted to mention that as part of that progress Congress has expressed interest in writing about continued support for this initiative and their deliberations about AHRQs budget. I think your questions and feedback are not necessarily theoretical for this discussion, they are quite relevant. We are all ears and particularly would like your feedback on these questions. In general, the value of this approach overall, this is just one part of hours patient safety program. We think that this is an important set of projects that are connected very closely to the larger learning health systems, conceptual framework and even more specifically we are eager to hear any feedback you might have about opportunities to engage healthcare operation leaders. I think some of the comments you made earlier are relevant to this question as well as the opportunities to spark public/private partnership coming out of the set of work. Any suggestions you might have for expansion, modifications, enhancements and of course, anything else.

Thanks Jeff. Don you had a question?

This is a comment in question put together, there is a hygienic simple question to answer which is how much a cluster of closely related harms is, I'm not sure I get that but more importantly, this may be flavored by a couple of projects by [Inaudible] but it is really easy to talk about prototypes and design thinking. In my experience they don't really understand what goes in to design thinking and that type of inquiry. They get the testing part sometimes, they get the prototype but they really don't put the human factor into the design thinking deep enough. The same would be true for the CONOPS. What I see in the gap, it didn't look at all novel but I know it is. Systems engineering thinking behind that, so the question is to what extent do you leverage the shared learning opportunities you have among the grantees to push out the expertise that they won't continue to use buzzwords. If I hear another innovation laboratory set up or another design thinking program that is steeped in detail and methodology I will go crazy. AHRQ can play a real leadership role, they ought to be able to articulate what it is that is necessary in the field. I think it is a real opportunity for AHRQ in this area . It can't be done without private partnerships, to tell you the truth. A federal agency could actually be the seat of all knowledge in this, is not. It is a bold direction for AHRQ and it will require a partnership.

Thanks Don, your comments are very well taken. In fact, many of the things you just mentioned, we have thought about and we haven't come up with any solutions. They are sort of a source of anxiety for us, in a way. The best I can offer is that we -- -- the underlying premise -- premise in all of this is it is a learning opportunity. It is a learning opportunity for AHRQ , it is a learning opportunity for the program officers and the project managing it. It is a learning opportunity for the grantees and it is something new for them. I think one of the questions I had, for our September meeting was what is reasonable to expect from this effort? What would we see as a success at the end of the period of performance? What is reasonable? This is new for the grantees, there are some that seem to be following the methodology in very good faith and doing some remarkable things. We talked about the [Inaudible] ramp this would be -- grant this would be one, there are others to -- also. Peter at Hopkins has recognize the value of this and Allen has had previous AHRQ grants, it is nothing new for them but for other grantees that we awarded grants to it may be a challenge for them. They were fairly good at preparing the application and repeating what we asked for in the application but can they move beyond the buzzword level and start to learn something new from it. It is a experiment for us and it is a experiment for the grantees, we have to be somewhat flexible in terms of what we can expect from it and what we can do through a grant mechanism.

When I worked in the private sector with engineering firms, the teams that I was placed on were full-time, intact teams. There was a team that would work 50-70 hours per week and we all knew each other very well. We knew one another's likes and dislikes and personal philosophies and we went out and had beers and understood the family relationships, we were certainly a stable, well intact team. I don't think this exists in terms of the type of teams that we see in many health services research applications.

Can I make a 62nd comment?

How about a 32nd -- 30 -- 32nd?

If you intend -- -- it's got to be a bigger picture, I have spent enough time with development offices and universities to know that you have to put this in a broader framework. Yes, this is preliminary and you will get preliminary data but ultimately the vision is much bigger. You have to be able to relate to what [Inaudible] is doing. The pitch has to be a old future of what health services research, technology and innovation is what is going to do together. That is my two cents.

Thank you Don, this is Jeff. One more quick point to make, as part of looking ahead to potential future grants and current grants, based on the findings they are producing and discovering. One of the things I have tried to push among the team is that we characterize impact as much as possible in a very quantitative way. In fact we have tried to push the grantees a bit on that in the September meeting. We have even considered that in looking ahead to the future opportunities and the possibility of including a projected impact statement in their application as a way to judge and make decisions about potential applications. One challenge with that is the methodology, itself calls for problem analysis in the early phase. There is discovery in the work itself that somewhat constrains the ability to project that this is not the traditional health services research. This is methodology that is a bit different and a bit more of a open, flexible slate than traditional health services research methodologies. In spite of that, I think there is the opportunity for us to push the envelope on impact because it is ultimately what our entire patient safety program is. To focus on safety no matter the methodology or the approach or the data we are using. We are going to continue to push that and hope to be able to give you more on these current grants and hopefully on grants in the future to let you know how we are thinking about impact with those.

May be impact it's built into the discovery page, maybe is premature to do it ahead of time?

Okay I have 3 quick sessions. First, in your mind, are you finding the lab or are you finding a particular problem? I know they are both there but which is the primary driver?

That is a great question, these are -- we use the P 30 grant mechanism that leads us a bit more into your response to the laboratory itself. Having said that, there are projects associated with it so it is a mix. In recognition of this methodology being somewhat novel at least two hour application I think we are [Inaudible].

The way my thinking is you are funding a sustainable resource. Over time they ought to be centers of excellence where you can bring problems and have the time to get to the solutions. Second question, how are you working with the industry, it seems like a perfect opportunity for a partnership.

The patent on the delivery table, that is a fairly direct route you can see that pathway [Captioners Transitioning]

This is really --

We do not see that potential. It is a matter of one-hour board of director says -- it is also in the recognition of the initial safety and quality. The impacts are more compelling.

The more you integrate industry, the more they can be your champions. They stand to benefit from this kind of thing.

Thank you for that input.

Can I say that is such a model of question and answering. [Laugh]

Thank you, four areas of expansion, essentially, when we were first introduced to talking about our work earlier this morning [Inaudible] it seems to be more setting focused, and I think picking on one or two problematic areas such as chronic illness and how that links into the leveraging of technology, like asynchronous communication, it may be an interesting way of moving forward. Is a look at -- as I look at [Inaudible], maybe [Inaudible]

Thanks to the particular examples we had with your observations with setting specific. We have the patient is a better representative, and particularly the outpatient grant.

That is a better representative in the ambulatory care grant. It is much more prominent than on the inpatient side.

Sherry?

Given that the incentives actually align with what you're trying to achieve, which disincentives for unsafe care that already exists, that is important context for how these programs should be taking hold. There is something I am not understanding about why this is hard as far as the sustainability or the likelihood that the system would not look at this as a solution, a lifeline, so my question is how are we learning that from those users, the grantees and others? I think there is something that is a barrier that we are not understanding. I think it is important to uncover if we are thinking about how we sustain this. One simple question might be what would keep you from integrating what we learn here in to usual care? Like this is the future.

For me, this might be a simplistic comment, but for me the [Inaudible] project are not constrained by the very technical nature of the problem or what we might think of is more typical for our patient safety program, where we are looking at different people within a team interaction. They are using a broader look across both types of those, and even types of factors in the clinical environment, and furthermore how they interact with each other and these different types of factors interact with each other. In some cases, the output of these grants are an algorithm for how they interact with each other. Although the clinician may benefit from more efficient care, it may require absolutely nothing for them to do once it is fixed. The output is something to the industry that is almost invisible for the clinician, although they might be happier because they're not bothered by extra alarms. I think there although -- also other things where they might change as a result of the output. Again, the synergistic power of the projects overall, it could be multiple aspects of those were how a team response to alarms in addition to false alarms themselves overall, that has a bigger impact on addressing one or the other. Does that answer your question? I think there are a lot of types of findings that do not necessarily fit homogeneous uniform sites for application. Some are healthcare organizations that need to apply this, and in other cases industry would be using the information and making products. I do not know if Alan has something to add.

The other thing to consider, Sherry, is of these projects are just halfway through their period of performance. Issues of sustainability -- they should have an idea of what success might mean for them. One possible measure of success in terms of carrying the sport, what is the progress they are making so satisfactory that their own institutions my wants to continue to support it in a meaningful fashion after the project ends as a formal grant? What are the processes that have been redesigned that do find their way into clinical practices? But the question about how can you expand this on a much broader scale that they have mentioned and maybe they can help on that because that is the level I think is driving this forward, but at the two year mark, it might be a little premature in terms of where they are thinking at this moment to actually address that broader problem.

I was going to comment on project two, [Inaudible] caught the eye of folks at the hospital that were impacted by that. They are potentially integrating that into their workflow, and that is moving in the direction you want these things to go in, and the ripple effect is there will be changes to workflow and some of that culture stuff, that takes time to take home. -- Take hold.

It is Sandy.

[Silence]

[Audio cutting in and out]

Sandy are you still there? Are you on mute?

Yes, I am here. Just a couple thoughts and suggestions, when is a really think it is important that the program continues to grow. I also think you guys are learning a lot that they are not learning. I encourage getting the groups together on their own, if you could, and midway through. Sometimes one of the reasons we see such progress is because everybody knows [Inaudible] not that any of us ever procrastinates. You know, but just the presentation today, [Inaudible] modify to accommodate that. Push evolution he -- evolutionary improvement as a model. They are going to be interested, but only if it is overwhelming and they cannot ignore it, or if it is a combination of safety that is also financially sustainable. One suggestion I would have that is not a strong suggestion is I would look at the places you have funded and there could be a list of more financially secure academic medical centers and one-way to get them engaged and invested is to make them invested in [Indiscernible - audience comment] I think it is mechanisms for fewer resources and having safety as possible but to have a tangible commitment of some sort or tangible contributions by the hospital to invest in this type of activity, even on an [Inaudible] basis. You can do something that will have an impact but taking more risk in designing the study. Those are just some thoughts and I think it should be expanded, but it should not be funded next cycle. The standard should be higher based on what we have learned and what others have said.

Mine is more of a comment, but there are areas where you're working on patient safety, but I was also thinking back to the beginning of our day Wendy gave the example of how we have such uncoordinated systems across healthcare. I would like to think about safety of hospitals outside of healthcare. How do we coordinate information and do a better job of keeping people safe and improving their health? If we can push the boundaries of the patient safety portfolio to person safety and health, I think there could be some really creative and desperately needed help from these human factors. Had we maybe not create another bell and whistle, but how do we better coordinate with our neighbors and our friends in these other organizations, getting back to the cycle we talked about. Maybe we can be a little more creative if there is another call, to think about safety beyond the ICU setting.

Even though it was not a question -- it is a push and initiative we have been on for three or more years, and we have labeled it extending patient safety to all areas of care. Again, we are very pleased to have a few here. I think the topic of diagnostic error and safety, that is automatically going to pull us even more into other settings --

I am pushing us beyond that, out of healthcare because I really need systems to identify and address determinants of health in the patients I work with, so much of that information in the system exists outside of the healthcare arena. So helping integrate into a better job of coordinating those systems -- it is pushing beyond.

You are absolutely right. That would be an understatement.

It could be preventable if we were upstreamed.

Thank you for the clarification.

Maybe dipping your toes, rather than taking on [Inaudible] there is a pretty substantial body of knowledge in [Indiscernible - audience comment] happens when people leave the hospital. It is not settings, but it is a huge cluster of problems that contributes to these avoidable high costs. So I think that could be really central. The question is, in the problems you are describing, how much available evidence would you describe as huge efforts to look within. How much is the available evidence that people have followed, the challenges across multiple systems for many patients influencing the problem, accelerated problems?

If I am understanding your question, how much original work actually happens and how much are these projects drying from authority available? Yes, that is something I was touching on with respect to the question or the point I made about impact, and that was -- I think that perfectly applied to a relatively blank slate to the problem. I think we have adapted this appropriately. We have set applications to make decisions about funding, so I think we are requiring a higher bar with some pre-work, at least a prediction about what they're going to find when they do their problem analysis. In my view, I think that is an appropriate adaptation of this methodology to the use we have for patient safety. Allen?

With ambulatory care, I think problem analysis is magnified. Here you were, starting with a blank slate. Most engineering efforts are reengineered with the system in place. It has become known, and with new technology in the last 10 years, they want to take advantage of that so they can incorporate it with the existing design to realize new capabilities and to avoid inefficiencies that the previous system had and the vulnerabilities for safety. With ambulatory care and social determinants of health pump --, we want to move beyond the health system into worklife and social determinants. That is a blank slate.

Okay, that was terrific and I think you heard a lot of enthusiasm from the work and and a lot of enthusiasm beyond. That is always a good sign. Anyway, thank you for spending some time with us today and we look forward to hearing more as the program evolves. As they understand, we have a couple of comments. Peggy, introduce yourself. Where did it go?

Thank you so much. I am Peggy with quality improvement patient safety and I will be very quick because I know the very last presentation is here and it has been a long and interesting and fascinating day. I'm hoping to contribute to that information and knowledge. We represent the patient safety organizations and all of their members. We are a much different art program. We are actually a private sector program with some oversight by art. We are an incubator of innovation. The act Congress intended for us to write the silos, so what they did is they gave us a baseline of peer review protections for all licensed providers so that we can all talk to each other and share information and connect to the healthcare continuum. It has taken us a while to figure out how to do that, but we are getting to the point where we are implementing programs that really do take a systems analysis. We are following patients from the moment the first point-of-care, and taking them to the emergency room, connecting EMS with emergency rooms, to gap analysis, how we can communicate better. The silos are intense. EMS and long-term-care do not have meaningful use. They have separate systems and separate care systems and regulated under different agencies, so there is not a lot of connection and our organizations work together to give them a connection so we can do gap analysis. And hospitals, we connect physicians together and get them in a room to talk to each other. We have a lot of programs with surgeons because of their judgment can be life-and-death to a patient. We have what we call convenience, where surgeons get together and talk about their problems and systems of care. We find surgeons can be great surgeons in one care system, and have message great outcomes in others, so we have people who are researching and looking at that. We have good positions, but why can their outcomes be different in a different environment? So we have other systems of analysis and programs we do, where the hospital system can bring in any one of their clinical contractors, long-term care, primary care, and also EMR vendors because we are finding with all the patient harm we are seeing, there is always EMR medical device contribution that may be large or small. What we are trying to do is bring everyone together so we do not change our reaction and our processes to the system. We want to change the system so that we create a learning system with our physicians and other healthcare providers, but if we can change the system, then it will never happen again, rather than trying to teach everyone so they will not have it happen over and over again in every system across the country. We are building new programs, primary care is desperate for quality programs and we are bringing peer review programs. We have hospice, so they're getting farther and farther away from the hospital settings so we can bring them into the hospital setting as well. We can get greater information and greater care. These are some of the examples of the programs that we are doing. We are incubators of innovative programs. We get no government funding, and that was designed of Congress. We solve each providers different problems, and so we have to provide value, and we have been through a lot of the questions you are going through now, which you are learning through health systems. So we have had to learn the hard way how to develop programs and we have learned by serving. We can do confidential servings, and we surveyed CEOs. What are your biggest problems? What do you see? From the CEO crowd, we find it is the issue that is costing them the most money that they do not understand why their providers cannot fix it or do a better job. When we

go to CMO's, the question there is what is keeping them up at night where they really think they can do a better job? There is a much different analysis in our programs, and they developed a much differently. With nursing staff, it is more about the day to day opportunities that they would like to have better efficiency, better content, but what we can do is bring together all of these different healthcare providers, whether it is within a health system or whether it is bringing all providers affiliated from all different types of health systems and raise the problem. Or what is even more interesting that we are doing is bringing in a case and case study and doing a group cause analysis, where what we are seeing is hospitals do a great job with cause analysis protections and it is usually a limited group. When we bring in all the expertise from all the different health systems, the root cause analysis is so much richer and we have so many more contribute factors that we are able to fix throughout the healthcare continuum and not just in one hospital system. We are learning and doing this and going through growing pains. I think we are now focusing more on connecting the healthcare continuum, sharing information, and really rapid process improvement. When we have these convening sessions, people can bring learnings home and implement them the next day. It is that rapid process improvement, where we have been doing it this way, we do not see the problem you are seeing anymore. That is what we do, and I'm hoping to come to your advisor meetings and bring a little bit more about what our patients organizations are doing. We would love to work with you on the learning health system because we can break a lot of barriers that the healthcare community may not be communicating to you as a barrier. Thank you so much and we would love to be the private side of the private partnership.

Thank you, Peggy. Okay, again, sorry. [Inaudible] I would like to acknowledge your turn as chair man/chairwoman for the last three years and thanks from all of us for your leadership. You arrived as chair shortly before I started and I know we have seen quite a bit of transition [Laugh] you have been here three years, yes? I am the third director. [Laugh] maybe it is me. And you have been a really steady presence and, as always, your insights and abilities to lead the discussion in a productive manner have been very helpful. On behalf of everybody, I want to say thank you for your service.

[Applause]

Thank you, it has been a real privilege. I have to say [Laugh] our director, number one, called me and I was surprised he asked me to step in with chair -- as chair without ever having been on a committee before. I kind of like it, going straight to the top. I have enjoyed the opportunity to spend more time to get to know and see all the things that we have been doing. We are looking at the evolution of the agency and the time I have been involved in your counsel. You know, you guys are doing great stuff and I always thought you are doing an even better job of making that clear to those who do not know you and love you to begin with. Anyways, so thank you very much.

[Applause]

I would like to add to that. Thanks once again. [Inaudible] coming to you for more help and guidance. [Inaudible] be the chair and you agree to do that. I would like to welcome Don with the round of applause, as the new chair beginning next week and. Don, are you still there?

Yes, I am. Thank you so much.

[Applause]

Welcome.

I hope that no one request that you see Emma rather feisty member -- I am a rather feisty member of care. I will try to moderate myself a little bit.

It will be good that you keep us on our toes. Do you have any more comments?

I just wanted to thank the other people who are retiring. Just once again, and I'll back thanks again -- [Inaudible] thanks again. It is a natural experiment, we will see. I want to thank the members, for Paul and Sharon, and all the presenters we have today, -- had today, for the presentations and those who attended in person and watched on the webcast. A lot of people are trying to write out, but we usually do at this point is go around and ask if anybody has any further comments or suggestions for the next meeting. I will sort of say as people may need to peel off, if anyone needs to say anything --

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Thank you, my last thought is perhaps we could think about what the big challenge that art could particulate -- articulate. For instance, they have this initiative. There is a lot of advertising, gets money, people think were going to be able to be more precise entry people on genetics and hereditary makeup. You can do something similar to that that they already have, with the precision health system program, where you are trying to learn about how the health systems work. The target is the patient and your target is the health system in all the variability on their health system. We might get to that elevator speech, it might be able to differentiate. They are not about that entirely, but there is a lot of a buzz generated by that. You are not just about this piece, but you might be able to generate a buzz that would differentiate you. Whatever the big challenge might be, could -- it could be that we talk about these things next time.

That would be great.

Any other parting thoughts or comments?

I second that idea except I would not want to use the word precision because I think then you might get -- you really have to think about language and communication and your brand and your differentiation as we talked about earlier because language and munication does matter. -- Communication does matter.

Okay then.

This is Sandy. Two things, one is we [Inaudible] a couple months ago. I do think our argument was there needs to be health services having a policy delivery corresponding component in precision medicine. There is enormous amount of money, so their attitude is [Inaudible] preordained what to do with them. We know that is not the case, and I think that is a potential opportunity. The other thing that is a concern of mine has to do with this moving very rapidly to a significant change in how we obtain people. We have a dramatic increased risk taken on by providers and financial models that are based on volume. I think there are a lot of potential threats, as well as opportunities to safety and quality, that we need to start thinking about differently. Those are what I think are two important things to try to get ahead of. Reimbursement will happen over the next 10 years, [Inaudible] I think now is the time for places like ours to think about what this is requiring or demanding if we will maintain improved safety and quality. I think this is my last meeting also. [Inaudible] second of all, it has been [Inaudible] I think the organization is doing well and I am optimistic about it going forward.

Thank you, Sandy.

Thank you, but you're not off the hook. We will be coming back to forgive given us a couple more interesting ideas, so you will hear from me.

I thought you were the one off the hook with me.

[Laugh]

With that, I think I will call the meeting adjourned. Those of you not in the room can see it is adjourning, so it think I will actually call it before it disappears. Thanks everyone, goodbye.

Thank you.

[Event concluded]